

**Class booklet**

# **Workshop 4**

Light and focus



# Tips & suggestions

## 1 Exercise your eye

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We recommend you attend a maximum number of photo exhibits and consult the works of the masters of photography on a regular basis.

**Exercising one's eye is one way to progress.** It helps you recognize your tastes and helps the composition of your images as you move forward.

## 2 Continue

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You will follow the photography initiation training for beginners. We think that you could enjoy the thematic courses as a logical follow-up to your training. You will be able to discover new, more thematic subjects such as composition, portrait, night photography or Lightroom software.

## 3 Discuss with others, get inspired

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Try to **share your love of photography** throughout the year with other passionate image-makers. Photo festivals, conferences, and portfolio reviews can be good ways of **making connections and building your artistic network.**

# #1

# LIGHT

Mode of measurement	Situation	Measured zone
Matrix or evaluative	Landscape, portrait, low-contrast scene	The entire image
Spot	Portrait, back-lit, subject with different lighting than background	Only one collimator at or outside of the centre (about 5% of the image)
Central-weighted	When the centre of the image must be well exposed without knowing precisely where to measure with the Spot mode.	The entire image, but with the weight on the centre of the image
Selective (only Canon)	Similar to the Spot mode but without clearly knowing precisely where to measure the light.	Identical to Spot mode, but covering a larger zone (about 10 % of the image around the chosen target)

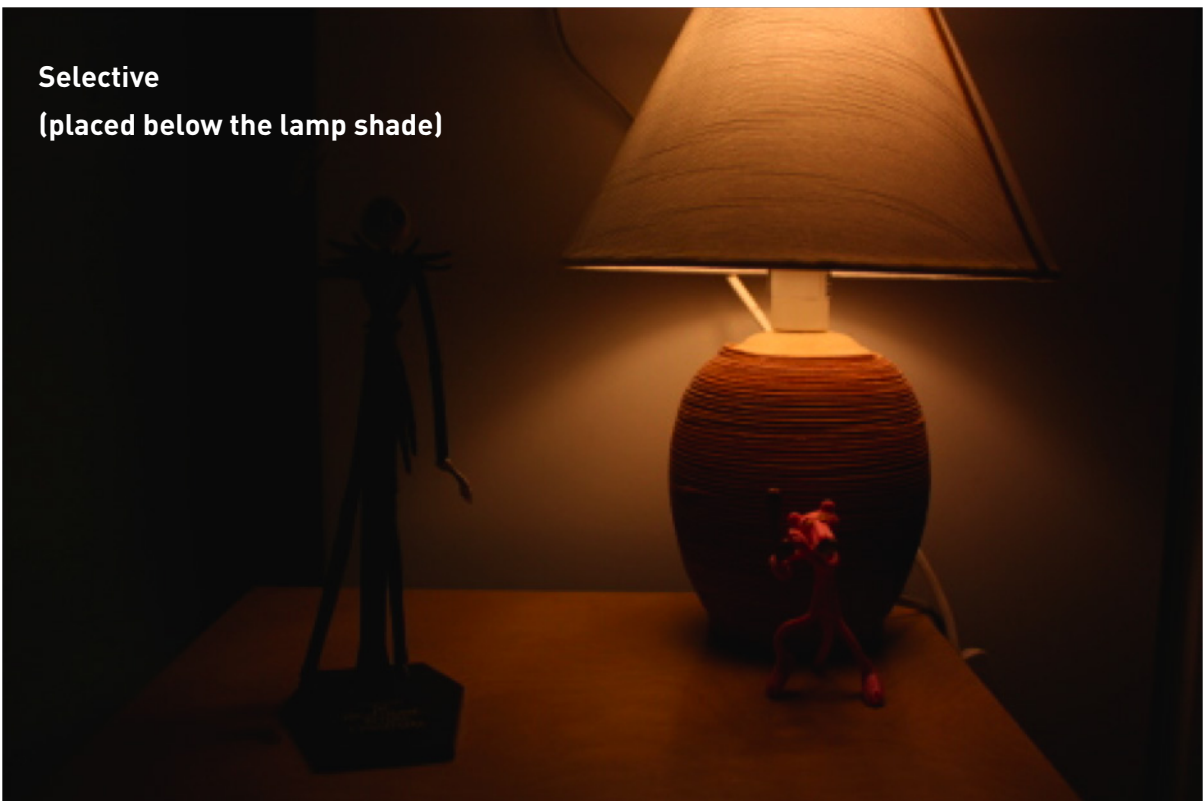
Matrix



**Spot**  
(placed below the lamp shade)



**Selective**  
(placed below the lamp shade)



Combinations of aperture settings, speed and ISO sensitivity can give the same exposure, for example the following 3 settings will produce the same image in terms of exposure – and histogram (according to the principle of the exposure triangle).

Setting 1	Setting 2	Setting 3
200 ISO	100 ISO	ISO 100
f/4	f/4	f/2.8
1/400 s	1/800 s	1/800 s

**In other words:**

From 1 to 2: if you double the ISO keeping your aperture constant, you will need to double the shutter speed from 1/400 s to 1/800 s to get the same exposure.

From 1 to 3: If you double the shutter speed keeping the ISO constant, you will need to double the amount of light reaching the sensor by opening the aperture and going from f/4 to f/2.8

From 2 to 3: If you divide the ISO value by 2 keeping a constant shutter speed, you will need to double the amount of light reaching the sensor by opening the aperture and go from f/4 to f/2.8

# #2

# MANUAL FOCUSING

Nowadays and despite the omnipotence of autofocus, manual focusing may still be necessary; too little light in the subject or lack of contrast can prevent the autofocus from focusing.

**For manual focusing, the photographer can use:**

- its viewfinder (but very tight on an APS-C)
- the distance graduation on the focus ring (on some lenses only)
- the digital zoom and live view (very precise solution, but requires stability)





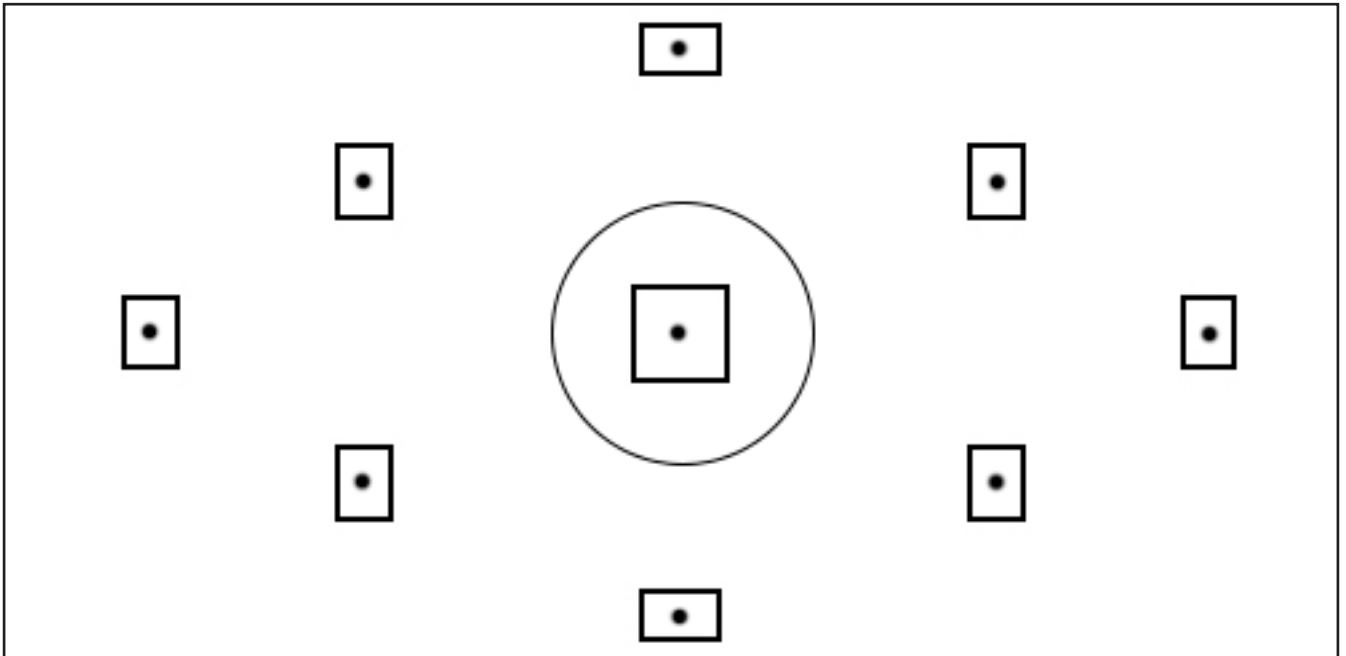
# #3

## AUTOFOCUS, HOW DOES IT WORK?

The autofocus system analyzes the contrast of the subject to be focused; knowing that the more blurred an element is, the less contrast it has, the autofocus adjusts its distance value until it achieves optimal contrast of the subject, and therefore its sharpest focus. The autofocus system therefore requires a sufficiently bright scene to be able to “see” and analyze the contrast of its subject.

**The autofocus can focus at various points in the image (frame) by means of collimators,** represented by small squares visible in the viewfinder, that are in fact the representation of the electronic cells used to make the autofocus. There are three types:

- Vertically oriented collimators
- Horizontally oriented collimators
- The cross/square collimators (they are placed in the centre of the frame and are the most efficient, as they adapt to all the orientations of the subject).



# #4

## DIFFERENT AUTOFOCUS MODES

Mode	How it works	Use cases	
<b>OneShot / AF-S</b>	It will focus when the shutter-release button is pressed. The focus is confirmed.	<b>Static subjects</b> (portrait, architecture,...)	Can be used with:  - Only one collimator, which can be placed in the frame.
<b>Servo / AF-C</b>	It will continually adjust its focus according to the movement of the subject. This mode never confirms the focus.	<b>Subjects in motion</b> (football player, dancer, singer,...)	- A group of collimators, which is possible to move within the frame.  - All the collimators.
<b>Ai Focus / AF-A</b>	It will automatically switch from OneShot/Af-S to Servo/AF-C mode if it detects movement of the subject.	<b>Static and mobile subjects</b>	

AF-S works most often, but when the subject is in a strong position and you have a shallow depth of field, the probability of missing focus in AF-S is such that you need to switch to Servo..



# #5

## MANUAL MODE

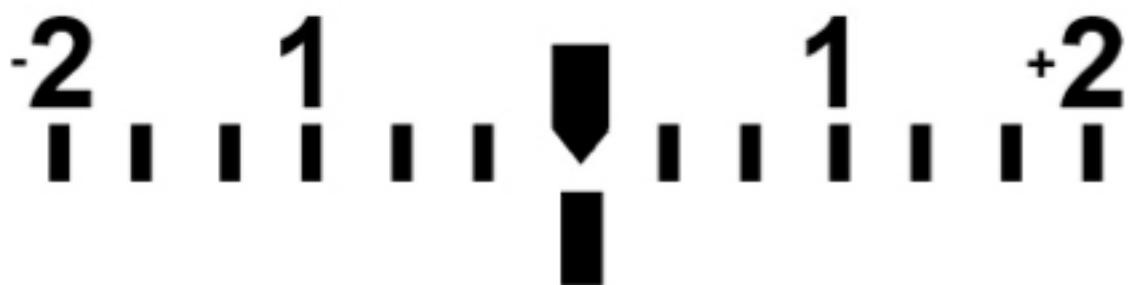
This mode of capture is indicated by the “M” pictogram.



It allows the adjustment of the three exposure factors (aperture, shutter speed and sensitivity).

A gauge tells us the future exposure of the scene, depending on the aperture, speed and sensitivity chosen.

This gauge can be found at various points of the camera: within the viewfinder, on the small upper control panel (on the expert and professional camera), and on the back of the camera.





# GLOSSARY OF PHOTOGRAPHIC TERMS

## A

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### **Autofocus:**

A system of sensors and motors that allow lenses to obtain focus automatically; in some cameras, the system also allows the lens to maintain focus on a moving subject.

Autofocus can be Continuous, meaning focus is maintained regardless of where it moves within the frame, or Single, meaning the point of focus is locked regardless of where the subject may move.

## B

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### **Backlight:**

When the light source is behind the subject.

## C

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### **Cell:**

A device for measuring the light to adjust the exposure of a camera.

### **Collimator:**

The collimator shows the area of the image where the distance is set (in an autofocus system) for focusing. It may also be used for light measuring in case of "spot" measuring mode.

### **Chromatic Aberration:**

Colour fringing that occurs when a lens does not focus different wavelengths (colours) of light equally. The results of chromatic aberration (green or purple generally) are most noticeable around the edges of high-contrast images,

especially toward the edges of the frame. Chromatic aberration is most common on less expensive lenses, although even the best optics can occasionally display lower levels of chromatic aberration under certain conditions.

## D

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### **Depth of field:**

The range of distance in a scene that appears to be in focus and will be reproduced as being acceptably sharp in an image. Depth of field is controlled in particular by the lens aperture, and extends for a distance in front of and behind the point on which the lens is focused.

### **Diaphragm or aperture:**

A ring or plate with a hole in the centre, the size of which controls the amount of light entering the camera. An adjustable diaphragm enlarges or reduces the size of the hole, or aperture permitting more or less light to pass through the lens to the film or digital sensor.

## E

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### **EXIF (Exchangeable Image File):**

Data produced by a digital camera that is attached to each image made by that camera (including information about the model of the camera, various settings, time stamping, etc).

### **Exposure:**

It is the phenomenon of light striking the surface of film or digital imaging sensor. The exposure is determined by the quantity of light passing through the lens aperture (defined by the f-stop) combined with the duration of the exposure (shutter speed), hitting a sensor with a given sensibility (ISO).



The proper exposure, which is best determined by the light-metering cell, can be established in a number of exposure modes including manual, program (automatic), shutter priority and aperture priority.

Over-exposure: a prolonged exposure resulting in too much light that can 'wash out' or erase important image details. These "burned" zones of the images will show in pure white.

Underexposure: an inadequate exposure resulting in overly dark areas in the image.

### **Exposure Modes:**

P - Programmed Auto: the camera sets the shutter speed and aperture for optimal exposure.

S or Tv - Shutter Priority / Time Value: User chooses the shutter speed; camera selects aperture for best results.

A or Av - Aperture Priority / Aperture Value : User chooses aperture; camera selects shutter speed for best results

M - Manual: User controls shutter speed, aperture and ISO.

### **Exposure time:**

The exposure time is the time required for the digital sensor or film to be properly exposed.

Editing:

The process by which you choose the best imagery for presentation or story telling.

## **F**

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### **Focal length:**

It is the distance between the focal point of a lens and the film plane when the lens is focused at infinity. It is used to designate the relative size and angle of view of a lens, expressed in millimeters (mm). A particular lens' focal length can generally be found engraved or printed on the front of the lens.

In 24x36 mm format a focal length of 50 mm is considered a normal lens, a focal length less than 40mm corresponds to a wide-angle lens while a focal value greater than 70mm is a telephoto lens.

### **Focus:**

(1) A point at which converging rays of light meet after being refracted or reflected.

(2) The focal point of a lens.

(3) The clear and sharply defined condition of an image, as in "is image is in focus."

(4) The adjustment of the distance setting on a lens to obtain a sharply defined image, as in to focus a camera.

### **File format:**

The way an image is saved to a digital camera's memory. JPEG, TIFF and RAW (DNG or other proprietary file formats) are the most common formats found in digital cameras.

### **Fill-in:**

The use of a flash during the day when facing the sun so as to balance the natural and artificial light. This technique opens up the shadows.

## **H**

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### **Histogram:**

A graph that shows the distribution of the tones in a digital image, ranging from black (left) to white (right). A photographer can use a histogram to understand and manipulate exposure. Many digital cameras have the ability to show the photographer a histogram of an image he or she has taken. Most image editing applications can create a histogram for an image.

## I

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### **Image definition:**

The definition of an image corresponds to the total amount of pixels within that image, obtained by multiplying the amount of horizontal pixels by the amount of vertical pixels. It is usually expressed in mega pixels or million of pixels. the definition will have an impact on the maximum size of print of a picture.

### **ISO:International Standards Organization (or ASA):**

ISO in digital photography represents the sensitivity of the electronic sensor that captures the image and is designated by a single, almost universally-accepted common rating system which uses the initials "ISO" before the digital camera's sensitivity setting number - e.g. ISO 100. The higher this value, the more sensitive the sensor is.

## J

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### **JPEG:**

Join Photographic Experts Group.

A standard for compressing image data where the size of the file is reduced. JPEG, with its 16.7 million colours, is well suited to compressing photographic images. A "JPEG" image file name carries the extension "jpg" (e.g. "portrait.jpg"). Many people refer to an image in JPEG format as a "JPEG," pronounced "jay-peg".

## K

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### **Kelvin:**

A unit of temperature. In photography, it refers most often to the temperature of a colour. The visible light spectrum is scientifically described in terms of colour temperature, and is measured in degrees Kelvin (K).

## L

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### **Lens:**

A true "lens" is a single piece of glass (or other transparent substance) having one or more curved surfaces used in changing the convergence of light rays. What we commonly call a photographic lens is more accurately and technically called an "objective," an optical device containing a combination of lenses that receives light rays from an object and form an image on the focal plane. However, dictionaries have come to accept the usage of the term "lens" to mean the entire photographic objective itself. A photographic lens will always be called a lens, even though it is not a lens, but has a lot of lenses in it. A camera lens collects and focuses rays of light to form an image on a digital camera's sensor or a traditional camera's film.

### **Light:**

-High light: The most luminous zones in an image.

-Incident light: Light falling on a surface - not the light reflected from it. Incident light rays are those that strike an object.

-Low light: The darkest zones of light in an image. A low light zone can also be considered a shadow.

-Reflected light: The light reflected off a subject. The camera sensor and the film pick up on this light.

## M

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### **Mégapixel:**

Refers to a million of pixels and is used in describing the number of pixels that a digital device's image sensor has. See "Image definition".

## N

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### Noise:

Parasite pixels that distort a digital photograph. Superimposed pixels on the image can appear distributed in a regular or irregular fashion. The intensity depends on numerous factors (sensitivity, luminosity, temperature, the size of the sensors).

## P

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### Pixel:

Abbreviation for “picture element”, a pixel is a small square of coloured light that forms a digital image. It is the smallest unit in a digital image. Think of a pixel as a single small tile in a large mosaic.

## R

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### RAW:

A file format that contains the original metadata with no particular treatment. This data creates a sort of digital “negative” that must be converted into a standard format with the help of software.

### Resolution:

Defines the number of points per inch. One could not say that the resolution characterizes an image, but rather its representation on a screen or a printer. Resolution also refers to the number of pixels a scanner can extract from a document.

## S

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### Saturation:

The saturation expresses the purity of the colour, i.e. the absence of gray and intermediate tones. Technically, the degree to which a

colour is undiluted by white light. On an everyday basis, the degree of colour intensity. A totally unsaturated colour photograph becomes monotone—or black and white.

### Sensor:

A sensor is an electronic system that transforms light into electronic signals. These signals are then converted into digital values that reflect the intensity of colours for each point in the image.

### Shutter:

The shutter blocks the passage of light traveling through the lens to the image sensor when it is closed, and allows light to reach it when it is open. Shutters are composed of blades, a curtain, a plate or another movable cover. They control the amount of time that light is allowed to pass through the opening to reach the image sensor.

## T

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### TIFF (Tagged-Image File Format):

This is an image format that does not degrade the image (but will occupy more disk space due to its size). It is used for optimal image resolution.

### Treatment :

Adjustments made to a digital photo to change its original aspect like saturation settings, brightness, contrast, colour ... Also called “post-production”.

## V

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### Vignette:

Vignetting is specific to zoom focal length and aperture: light is distributed unevenly and what results is a gradual reduction of the light at the edges of the image causing dark borders.

# W

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## **WB-auto (Automatic White Balance):**

This is the automatic adjustment of the white balance, ie colourimetry depending on the light source.

## **White balance:**

White balance is the way to correct the colour matching of an image based on the type of lighting to prevent an incorrect colourcast in the image.

## **Wide-angle:**

A wide-angle is a lens used for short focal lengths (less than 40mm). The angle of vision is, as the name suggests, high.

# Z

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## **Zoom-Digital:**

A digital zoom interpolates the central part of the image to simulate an optical zoom. The more one zooms in on the subject the more one loses in quality in the image.

## **Zoom-Optical:**

An optical system composed of lenses that allow you to “zoom in” or “zoom out” on your photographic subject without changing your physical position or the definition of the captured image.



# Learn more about the work of great photographers on these topics:

## Depth of field and sharpness

# 1

Stefan Vanfieteren for his portraits with minimum depth of field, Ansel Adams, Edward Weston and more from the “group F / 64” for landscapes and still lifes.

# 2

## Blur, shake and stopped action

For blur, see: Bernard Plossu, Willy Ronis (e.g. “Vendome rain”, 1947)

For stopped action and movement: Cartier-Bresson and his famous decisive moment (which defines the moment the photographer presses the release button and captures a defining image).

## Light and colour

# 3

Bruce Gilden (Flash), Martin Parr (very marked colour and circular flash) and Massimo Vitali for his famous overexposures.

# Inspire your photography with our magazine



ARTICLES

ESSAYS

INTERVIEWS

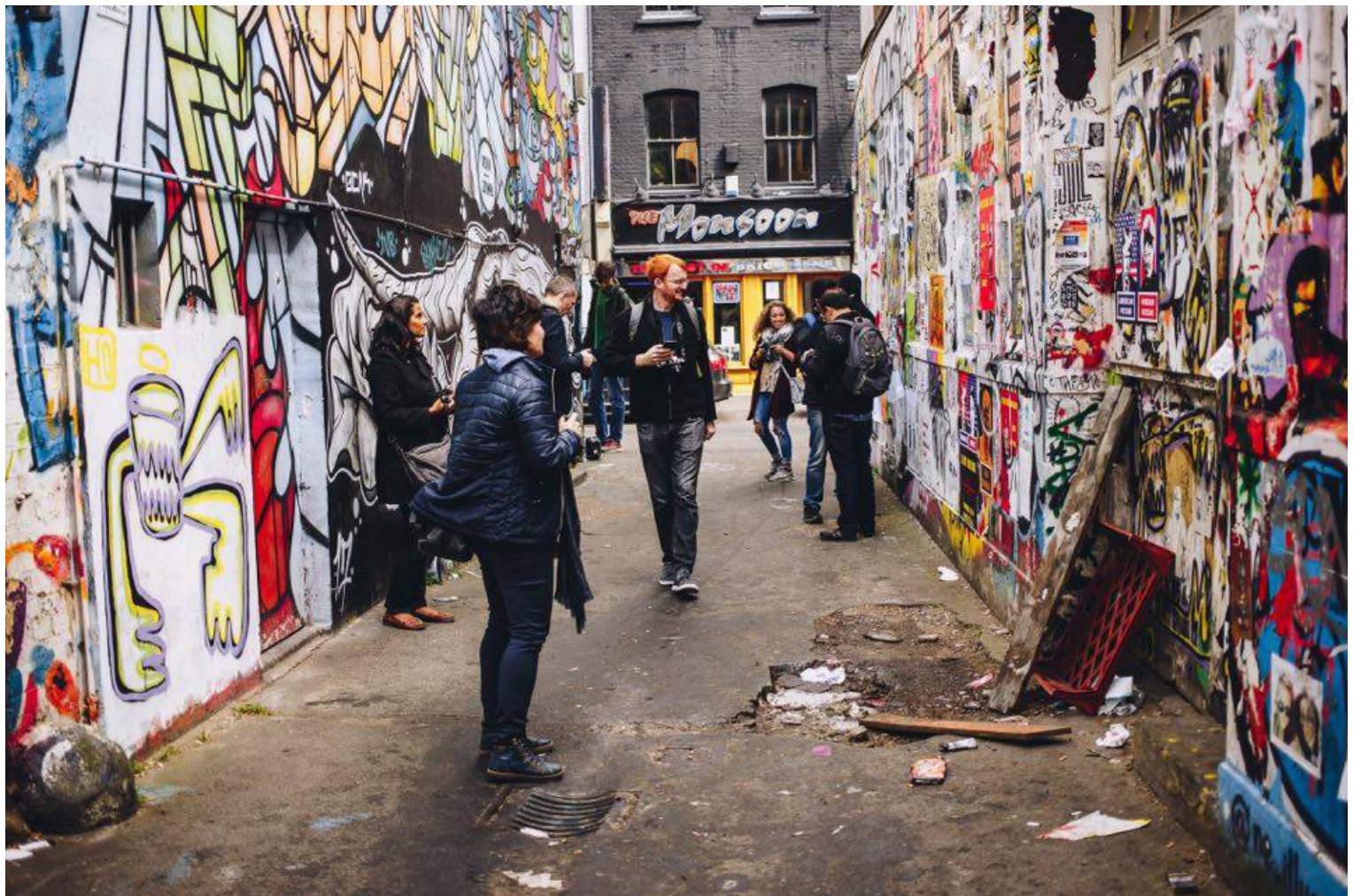
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