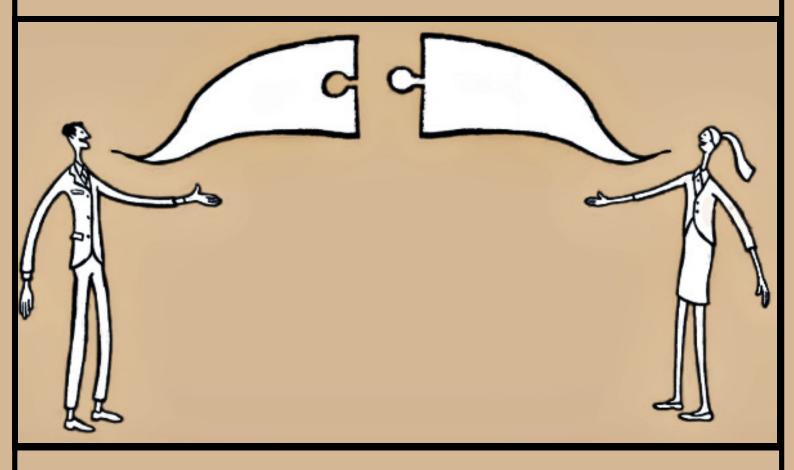
# THE IB TIMES

**MARCH 2021** 



FROM STUDENTS, FOR STUDENTS

IB WORD SCHOOL NO. 6159

# EDITORIAL NOTE

#### **Communicators**

Communication is a process in which a specific message is conveyed between two or more individuals. There are several aspects of this process that have to be fulfilled in order for the conversation to contain communication. The message can be expressed in different ways - be it various languages, signs or symbols. Even though the message itself is of great significance, to conduct a successful communication both sides have to be ready to listen to each other. That is why I hope you will give our team a chance and listen to the message that can be found in this March Edition concerning this particular IB trait.

Julia Chwatko

#### Our team:

Editor in chief - Aurelia Adamczak Vice editor in chief - Julia Chwatko Graphic Designers - Jędrzej Wójtowicz, Kasia Żamojda, Szymon Łukaszewicz Social media - Michalina Anikiej Contributors
in this edition:
Marcin Andraka,
Aleksander Skutnik, Jędrzej
Wójtowicz, Magdalena Alifier,
Lena Przybyłowska

# CONTENT

3

COMMUNICATION
THAT, QUITE FRANKLY,
COUNTERS FACT

8

COMPLETE GUIDE TO ASTROLOGY PART 6 13

GET ENTERTAINED!

**16** 

A MOVIE FOR THE MONTH & A MONTH FOR THE MOVIE 19

GLOSSOPHOBIA -FEAR OF PUBLIC SPEAKING 20

**POEM** 



# COMMUNICATION THAT, QUITE FRANKLY, COUNTERS FACT

Sound waves travel through the air as vibrations, written words consist of patches of ink particles on paper, Wi-Fi is carried by electromagnetic waves and data in computers is stored in arrangements of electrons in their memory. What I listed above are things that come to mind when I think of communication, but that is not all they have in common. All of them require physical media, carriers or otherwise observable phenomena in our physical world in order to transfer information, or communicate meaning. This much seems obvious: information has to be represented by something in the universe after all, correct? There are many ways in which our everyday intuitions of the world around us are a hindrance rather than aid in understanding the interactions that govern the world of the very small – the quantum realm. However, it has always seemed to be the case that information is one of the rare instances of a very valuable intuition that does apply on all scales of the universe; it is something that has informed our exploration of everything from electrons to black holes and has allowed us to posit entire theories of physics of extreme conditions.

You may have heard, my dear Reader, of terms like 'quantum', 'quanta' or 'quantised'. For the sake of this article I feel it is only right to establish some working definitions of them. After all, helping you towards a deeper and more genuine understanding of the underlying science is the true goal of this piece. A quantum (and its plural – quanta) is simple enough: this is just a specific, discrete value. For instance, the energy of photons (particle carriers of light) can only appear in multiples of a certain amount – the quantum, rather than as any given value on a continuous spectrum. That is also what is meant by quantised values – ones that exist in quanta rather than on continuous spectra. With the fundamentals of quantum mechanics (QM) cleared up I dare say it is time to speak about its next big concept: wave functions which are used to generate probability distributions.

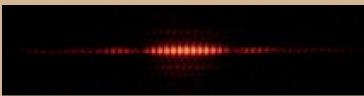
In QM it is impossible to exactly determine, for example, the position of a particle. We can only know how likely it is to be in a given place, but not where it is exactly. This is what is called an 'observable' – a physical, measurable property of a system. Even if it is impossible to find its exact value, an observable has a genuine physical representation. Examples include: spin, position, momentum, energy, time and so on. What is important is that an observable can be described mathematically via QM. However, not all mathematically valid quantities in QM are observables. Some mathematical constructions that do describe objects in QM do not in fact have any physical representation. These are sometimes referred to as unobservables, because they literally cannot be observed in the physical world. In fact, the wave equation in and of itself is not physical. As a piece of mathematics it does genuinely describe the behaviour of a particle, but it does not actually correspond to any tangible and measurable quantity in the world.

It is important to understand the extreme logical implications of this fact: a wave function is something that literally does not exist in the physical world, yet may be used conceptually to meaningfully describe particle behaviours in QM. Let's address the elephant in the room though. Since the wave function ultimately describes something real, without itself being physical, could you use it to transmit information without using any physical media or data carriers? Well, let's have a look!

In order to investigate the information carried by the wave function we have to start by considering a classic QM result: Young's double-slit experiment. As shown in the figure below, a source of coherent light (of the same frequency) is shone on two slits. It passes through them and individual photons are then detected on the screen behind the slits. Due to the wave-like nature of light, an interference pattern consisting of discrete peaks of intense light is formed.



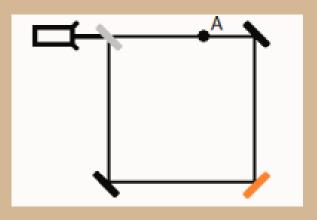
**Figure 1**: A double-slit interference pattern. However, block one slit and the interference immediately collapses.



**Figure 2**: A single-slit (non-interference) pattern.

Notice that the result of light passing through both slits is not just a simple sum of what is yielded by shining the light through two slits individually. The double-slit case is explicitly different and disconnected from the individual slits. It is worth noting that under sufficient circumstances even particles that have mass (unlike photons) behave like this. Electrons interfere with each other in a double-slit experiment. They are particles, but behave much like waves.

Let us not get distracted from the real goal, which is setting up a contraption to transmit information without a physical data carrier. This is best achieved with the use of photons, rather than massive particles. The following figure shows a setup for achieving interference without slits, called a Mach-Zehnder Interferometer:



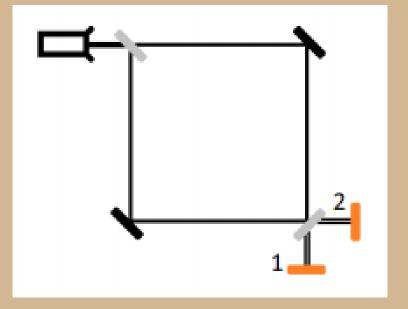
**Figure 3**: A schematic of the Mach-Zehnder Interferometer.

Instead of two slits, light coming from an emitter encounters a beam-splitter, a special mirror that reflects half of incoming photons and lets the other half travel right through. These separate beams are then combined on the screen, resulting in an interference pattern. Do note that we can interact with the individual split beams. For instance, inserting a material like glass into one of them at point A will cause the beam in question to move more slowly, shifting it relative to the other beam and changing the interference pattern seen on the screen. Inserting an opaque object, on the other hand, will interrupt the flow of one of the beams. The other will have nothing to interfere with and thus the interference pattern will simply disappear. This revelation is the basis of our information transfer: we can extract information from a system (based on there being an interference pattern or not) even though, or maybe specifically because, there was no physical transfer of particles. Most importantly, the experimental setup shown here can be expanded upon by adding more beam-splitters, which has its own advantageous effects...

But before tackling that, now might be the best moment to talk about superposition – a property of all particles, massive and massless alike, which gives rise to the quantum mechanical wave function in the first place. Photons in our interferometer exist in superpositions from when they are emitted until they are recorded on the screen. The name superposition comes from a seemingly related general concept of superposition of waves – that amplitudes of two waves add together when said waves combine. This analogy is not quite perfect for QM because there is nothing to add, no physical property (just like in the wave function) to interact with. When we observe an interference pattern, it is the result of the quantum superposition of photons. This explains why the interference pattern can disappear. When we observe photons along one of the beams, we find information about its position – we measure it. The act of measurement is very important in QM and just measuring a system necessarily causes a change in it. It is the measurement of the photons' positions that results in the collapse of the interference pattern. In order for it to develop we must not extract any

information related to the photons on their way to the screen. If we block their path, that is just like knowing that they did not travel through the path. Thus, we have unwittingly made a measurement.

Returning to our previous thought experiment, introducing a second beam-splitter and a pair of screens this time, we get what is called the Elitzur Vaidman Experiment:



**Figure 4:** A schematic of the Elitzur-Vaidman Experiment.

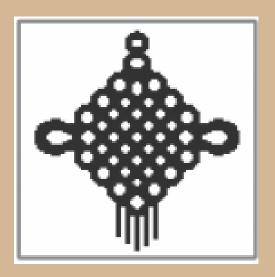
It is important to note that (as long as both original beams pass unimpeded through the interference setup), the detectors are specifically set such that Detector 1 allows the interference pattern to be constructive, whereas Detector 2 only allows for destructive interference, which is a special case in which the interference does occur, but results in waves cancelling each other out and not showing any overall pattern. There is a very good reason for why we did all this: if we interrupt one of the beams' paths, the other makes it so that both detectors show simple single slit patterns (instead of one showing interference and the other – darkness). All of this is incredibly convoluted, but has effectively allowed us to send new information:

The light now hitting the second detector, specifically by NOT allowing the photons to travel through the system. A term has been "counterfactual coined describe this phenomenon: communication". There are two important caveats, however. Firstly, the method is bottlenecked deeply by the very slow transfer speed, although that is up to future inventors to improve upon. Crucially, the second drawback is the accuracy of the method. If we define not blocking the path as a binary 0 and blocking it as 1, the former is virtually guaranteed to be correctly identified, while the latter has a small probability of wrongly returning 0 purely by chance. However, combining more and more beam-splitters allows for the probability of error to be minimised (but never completely erased!).

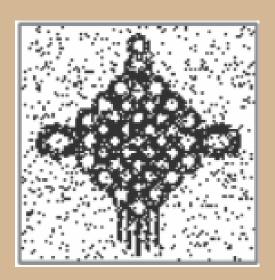


ts apparent limitations notwithstanding, the described mode of non-physical, counterfactual communication has several significant implications for the wider world of QM technologies. For example, quantum computers are able to carry out calculations without being turned on. Just them being able to work is necessarily giving us information in and of itself. Similarly, once we begin to apply quantum cryptography in the future, just the possibility of someone intercepting a communication, rather than the actual act of them doing so, could be detected by QM-based security. Those are real world effects, which cannot be disputed. What can and very much is a bone of contention, is how the information is carried. The first of the leading interpretations is that the unobstructed beam carries more information than we had previously thought. It is said to be entangled with the other beam, which means that observing one allows us to gain information about the other. This is a well-documented phenomenon generally, in which two entangled particles may "exchange" information instantaneously over arbitrarily long distances. It stands to reason that this may be responsible for the functioning of our interferometer setup. The second interpretation is that the information may indeed be carried by a non-physical unobservable or perhaps by the wave function? Maybe they are more real than we had previously suspected and are capable of holding physical information within them.

Whatever the case may be, a team of researchers spearheaded by Yuan Cao of the University of Science and Technology of China has managed to transmit a simple image with the use of counterfactual communication. They sent the following image of a Chinese knot without any physical media:



**Figure 5:** The original image of the Chinese knot.



**Figure 6:** The transmitted image.

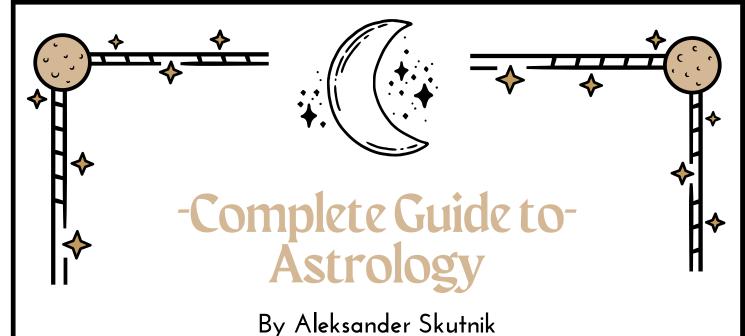
Black pixels were defined as binary 0s and white as 1s. As you can see, the aforementioned limitation is very apparent in that multiple white pixels were misinterpreted as black, although the resemblance of the received image to the original is indisputable. Although the brunt of the discussion on this topic currently remains theoretical, the number of publications providing experimental inquiry into this phenomenon is slowly becoming greater. Perhaps in the near future it will become possible to use it in a more accessible and organised manner and maybe the physical limitations on communication will cease to be?

#### **Marcin Andraka**

#### Bibliography:

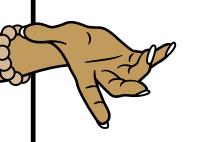
Roebke, J., 2021. Nil Communication: How to Send a Message without Sending Anything at All. [online] Scientific American. Available at: <a href="https://www.scientificamerican.com/article/nil">https://www.scientificamerican.com/article/nil</a> communication-how-to-send-a-message-without-sending anything-at-all/> [Accessed 10 March 2021].

Cao, Y., Li, Y.-H., Cao, Z., Yin, J., Chen, Y.-A., Yin, H.-L., ... Pan, J.-W. (2017). Direct counterfactual communication via quantum Zeno effect. Proceedings of the National Academy of Sciences, 114(19), 4920–4924. doi:10.1073/pnas.1614560114



By Aleksander Skutnik Part 6: Placements' Meaning - Venus

Hey guys, it's Alex! Welcome to the next part of my Complete Guide to Astrology! If you're new, I highly recommend that you check out my articles from the previous issues of IB Times, as they will introduce you to the topic, and if you're a regular reader, welcome back:) Today, I will tell you some facts about Venus. Hope you'll enjoy!!<3



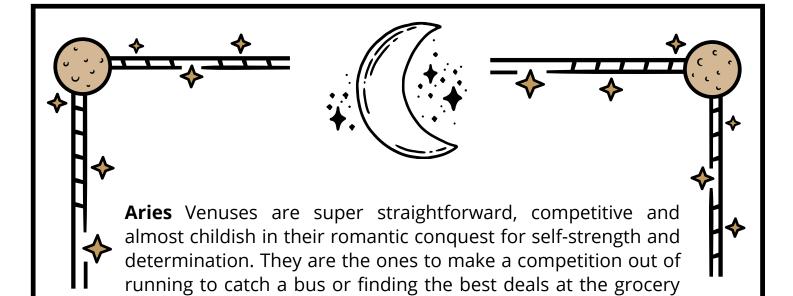




Venus is the planet of love, beauty, style, glamour, grace, and every other adjective you could pick up from the Paris Fashion Week broadcast (or maybe you've been there in person?? if yes, I'm JEALOUS). It defines our stance towards love, how we form and maintain relationships, show affection, what qualities we value, what do we enjoy, and so on. In short: Venus is the feminine and delicate side of ourselves (exactly the opposite of masculine Mars, which will be the topic of my next article!!) Now, I will move on to describing Venus in particular signs.





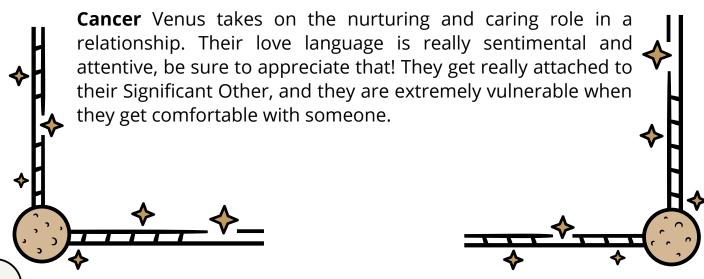


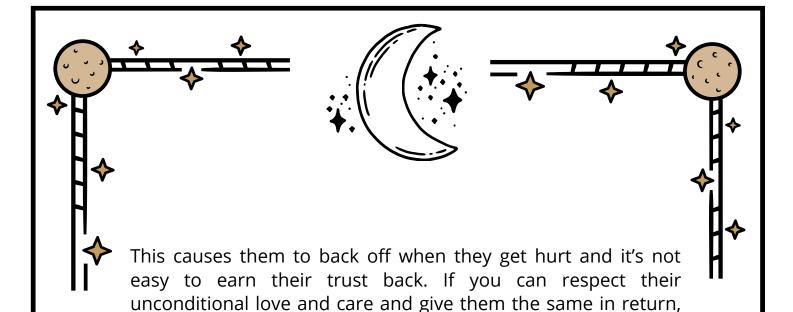
**Taurus** Venus focuses on the sensual pleasure and physical closeness. Cuddles and hugs are the best way to please a Taurus Venus. They value comfort and satisfaction. Romantic dates with delicious food and comfort movies with a blanket are their go-to activities. They need some time to get comfortable and don't enjoy things getting too fast or serious.

store. They love to express their independence and self-worth. In approaching others, they might seem too direct or even at times challenging. They love action, and if you can show them a

good, adventurous time, you'll win their heart.

**Gemini** Venuses build their relationships on the concept of carefree, varied and inspirational conversations, dates and ideas. They need to keep themselves occupied with different things and they need to have the time and space for their activities outside the relationship. They want someone who will share their knowledge and interests with them, as well as accompany them in their curiosity-led trips and activities.



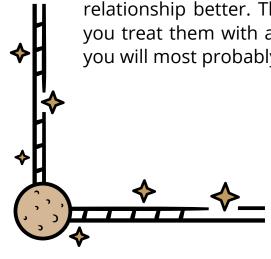


**Leo** Venus is all about affection and admiration of themselves. You can say that this is the staple of each of their relationships-without the feeling of being admired and praised, they may quickly lose interest. But it doesn't only go one way- if you manage to satisfy their needs, they will reward you with great loyalty, amazing sense of humour, and unconditional love.

it's a match made in heaven.

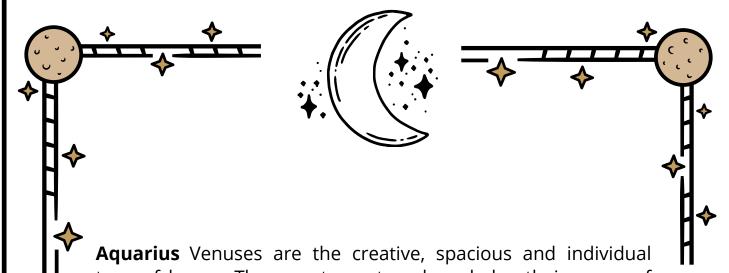
**Virgo** Venus isn't quite flirtatious- their priority is to work on the relationship and focus on the little things. This devotion to details and your personal matters is a true gift that not many people are willing to offer. If you appreciate their hard work and efforts and give it back to them by making them feel needed and appreciated, it will probably be a really inspiring and fruitful relationship.

**Libra** Venus are usually very kind people. They value their manners the most and they seek balance in the relationship. They might even adjust their situation or stance to suit your relationship better. They're very gentle and subtle lovers, so if you treat them with appropriate kindness and rationality back, you will most probably get along really well.



10

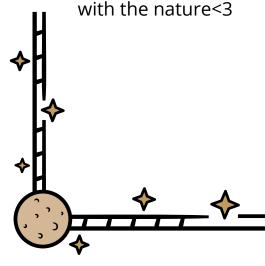




**Aquarius** Venuses are the creative, spacious and individual type of lovers. They want you to acknowledge their sense of individuality and standing out from the crowd. They want to explore and share different topics and interests in a peculiar way. If you are willing to give them the validation they need and try out many different unconventional things with them, they'll reward you with a fun time and a lot of space for yourself.

**Pisces** Venus are the dreamy and artistic people. They love talking about different types of expressing emotions and feelings and they do that in a carefree, spirited way. They see so many perspectives and ideas that they want to share with you give them the thought space in order to please them. On the other hand, because of their dreaminess and head in the clouds, they might have problems with commitment and stability. They will unconditionally love you for who you are, and they will see the good aspects in you.

That's it for this month's edition of my Complete Guide to Astrology. I hope you enjoyed it, and as always, I highly encourage you to stay tuned for the next parts in the next issues of the IB Times! Enjoy the awakening spring and bloom with the nature<3



\*\*\*



# ENTERTAINED

## THE LAST FAMILY

Jan P. Matuszyński, 2016 Poland Movie - Biography, Drama IMDB 7.5/10 - Available on Netflix

A biographical drama, portraying a struggle of living in a dysfunctional family of Polish painter Zdzislaw Beksinski. The movie depicts the tragical way of Tomasz Beksinski - Zdzislaw's son - towards suicide. Tomasz commited suicide in december 1999 and his story became a national tragedy. The plot is a touching representation of complicated family issues that people have to experience on a daily basis.



## I Hope You'll Die Next Time:)

Hope You'll Die Next Time <mark>:</mark>



Mihály Schwechtje, 2018 Hungary

MOVIE - DRAMA, YOUNG-ADULT
IMDB 7.2/10 - AVAILABLE ON HBO MAX

A young student, Eszter, develops feelings towards her english teacher, who announces that he will be leaving to London for a job. The pupil starts sexting with the tutor. Movie shows the risks of such actions and the possibilities of modern technology but also shows the tragedy of developing feelings that can not be satisfied and losing control over them.





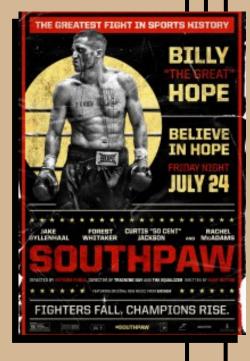
### SOUTHPAW

Antoine Fuqua, 2015 USA

MOVIE - DRAMA, SPORT

IMDB 7.4/10 - AVAILABLE ON NETFLIX

After a fatal incident, a boxer Billy Hope hits his rock-bottom. After going through a path of disaster and damage, Billy decides to fight for the last two things he loves, his daughter and his career. The amount of determination shown in the movie is affecting the viewer to such a great extent that they may believe that 'everything is possible' once again. Apart from the masterpiece writing and music, Jake Gyllenhaal gave a great performance and the spectator can dive straight ahead into the movie.



## **A LONG WAY DOWN**

Pascal Chaumeil, 2014 UK

MOVIE - COMEDY, DRAMA

IMDB 6.4/10 - AVAILABLE ON NETFLIX



New Year's eve - a day with one of the highest rates of suicides. Four strangers climb a skyscraper in London with this particular intention. After a short conversation, they form a very particulat friendship and a pact, saying that none of them will try suicide untill the Valentine's day. The movie uses dark humor in a perfect manner to show the fight that needs to be undertaken by people with suicidal thoughts. As you may have already noticed, I'm a great enthusiast of the combination of drama and comedy, but "A Long Way Down" occupies a special place in my heart and became a sort of 'guilty pleasure' of mine.



### PATRICK MELROSE

Edward Berger, 2018 USA
TV SERIES- DRAMA, MINI-SERIES

IMDB 8.1/10 - AVAILABLE ON HBO MAX

A gem among novel adaptations. Patrick Melrose, a young addict, goes to the USA to bring home the ashes of his deceased father. While in the US, Patrick's old traumas and 'ghosts' come to haunt him and he tries to overcome them. The deal of emotions that Benedict Cumberbatch is able to project towards the audience is a job of a real artist. One can enjoy the series without paying a closer attention to the plot, but also they can truly experience the struggle and fight conducted by Patrick when they dive head first into the marvelous adaptation.



## THE MEDIUM

Bloober Team, 2021 Poland

GAME - PSYCHOLOGICAL HORROR

METACRITIC 76/100 - AVAILABLE ON STEAM



A third-person, psychological horror, where you need to explore the past of different people by communicating with their ghosts. The player gets to analyze the different types of trauma that others had to go through. The plot itself is quite moving and the mechanics are interesting. The game works quite well but it could use some optimization, especially when our GPU has to render two locations at the same time, which seems to be the main gimmick of the game, because as a medium we have to live in two different worlds at the same time.

Jędrzej Wójtowicz



## A MOVIE FOR THE MONTH & A MONTH FOR THE MOVIE

**MARCH: PROMISING YOUNG WOMAN (2020)** 

Promising Young Woman is a 2020 comedy thriller filled with humour and social dilemmas. Emerald Fennell, twice nominated for the Golden Globes, skilfully creates an incredibly distinctive and vibrant picture.

The majority of plot descriptions do not really tell You what to expect, but the word most commonly used is 'revenge'. And boy, do we ever get revenge.

The plot is quite coherent and easy to follow. No time-loops, no memory-blanks. It's definitely a suspenseful and eventful story, though. The course of action is presented to us from the main character's perspective and we are thoroughly guided through her experiences. All the same, some dynamic scenes and surprising plot twists are to be expected.



The main character's name is Cassie. She's pretty, blonde, and so obviously bearing a secret that it is almost impossible not to try and figure out the motives behind her behaviour. Carey Mulligan is without a doubt suited for this role. Her confidence and charming smirks highlight how Cassie is, unapologetically and undeniably, herself.

Although the protagonist is in fact likeable, I did not grow especially fond of her throughout the film. Cassie is bright and witty, cunning yet adorable, but she didn't strike me as authentic. Something about her persona seems fake and forced, and I was under the impression that acting is not to blame here the basic concept on which the character is built lacks vulnerability. She's promising and young, but not real.

The scenery is just as the plot, to an extent: energetic, vivid, and somewhat overwhelming. Bright colours and an impressive number of detail might remind You of a Netflix production, which, honestly, many could enjoy. Everything in the film seems clean, freshly-bought and treated with an unhealthy amount of fabric softener.

I found it rather annoying and overwhelming but I believe there was a greater purpose for the creation of such extreme surroundings. They beautifully contrast with the obscurity and horror of the matters the film mentions and underline the unexpected. The sugary shades may as well

provide a shelter for when the viewers choose to ignore the growing weight on their chests. The scenery may be many things, but certainly not boring. The film touches on both crucial and current subjects. Among many things, it conveys how



consent and general approach to sex are perceived by women. The message could (and would!) be crystal clear, if Promising Young Woman refrained from blurring the lines.

#### [SPOILER ALERT]

The issue of consent is currently widely disputed and, sadly, still controversial. Promising Young Woman explains the topic step by step. The movie is direct in its messaging and leaves no space for unwanted interpretation. What it does leave space for, though, is denial.

The last events of the film enable the majority of viewers to mutter a silent 'I'd never do that!', comforting themselves about the unspoken implication. Thereby it is just as much possible to completely reject the claims made by the movie. While it is obvious that not everyone is capable of murder, the point Promising Young Woman is trying to make seems to be unwittingly overturned by the unexpected plot twist. And here's why.

Ryan is perfect. He's caring, he's intelligent, he's witty. He's a doctor and he does not give up on Cassie - and that's what makes their relationship work. Ryan is the ideal example of an average nice man who once was the perfect boy next door. Because he is indeed nice, until Cassie learns that he isn't.

The shock that meets the viewer, the heartbreak, rage and disgust, it all serves a purpose: it could be anyone. The facade Ryan puts on is misleading and only proves his ignorance. The man calls his own deed 'a mistake', still fails to acknowledge that this 'mistake' cost a girl her life.

And the image of Ryan as the exemplary typical man is shattered when Al commits another crime. Introducing this action to the plot narrows down the target audience, the potential predators, and makes the main argument behind the message vulnerable and easy to call into question. Further demonizing the villain of the story does provide an elaboration on the problem of seemingly blameless men being predators, however it also partly disrupts the universality of the film, which would otherwise be a great asset of the piece.



#### [SPOILER ALERT OVER:D]

Notwithstanding my partial disappointment, it would be a lie to say I did not enjoy the film. Promising Young Woman is colourful and dark, playful and frightening at once. The story told within less than two hours offers an atypical explanation to the everlasting discourse. It doesn't feel as heavy as I expected, despite focusing on such delicate subjects.

Promising Young Woman is not what I hoped it would be, but it is worth Your attention and time. Presented with a dilemma, a personal approach and finally a peculiar, but riveting, solution, one certainly gains perspective. Having received international acclaim and numerous nominations, the title will doubtlessly stay on our minds for some time.

The film does not encourage the viewer to make a choice or take a side - it simply shows the story in its (almost) whole monstrosity, providing a slow and redundantly careful example of a third-person perspective. It isn't necessarily a must-watch position. Yet, taking the current controversies into account, refusing to watch it would be awfully naive, even if You're not exactly promising, young, or even a woman yourself:)

- m.a.

# Glossophobia fear of public speaking

Every one of us possesses some kind of fear, and most likely, a mechanism associated with overcoming it. Be it arachnophobia - fear of spiders, acrophobia - fear of heights, or even a more personal one, philophobia - fear of falling in love. However, what you're going to read about in this article is glossophobia - the fear of public speaking.

Glossophobia is one of the most common phobias with a percentage of people that suffer from it being as high as 73%. Yes, you've read that correctly, seventy-three percent of the population has a fear that primarily originated from what is known to be a judgmental fundament of our society. While we're greatly affected by the negative perception of our actions, it doesn't quite show subtly. It comes out in an extremely uncomfortable form, and if untreated, an extremely dangerous one.

Glossophobia has strong connections to Social Anxiety Disorder (SAD) as well as the fight-or-flight response, which is a response that used to be a survival tool for our predecessors. Living in a tribe used to be a basic social skill required not only for an individual's sense of belonging but also for survival. The rejection from the group would therefore mean death. As we can notice, many (many, many, many) years later we can see the effects of this primal rule in the fear of public speaking. How is it actually connected, you may wonder? Well, to put it in a more easily accessible language, similarly to the fight-or-flight mechanism where rejection = death, whatever public speech we have to make = possibility of being judged = rejection from society/embarrassment.

The whole problem starts in the pre-frontal lobe. It's an area of the brain that is highly sensitive to anxiety. As we are exposed to stressful situations, the aforementioned area activates producing increasing numbers of anxiety-inducing hormones. In the process, our brain shuts down and the retrieval of any memory we might've had is impossible. The frontal lobe is shut down, our brain is frozen, any exam, presentation, or speech we had, is ruined. What can be helpful in such situations is what we are taught from a young age at school, at home, and possibly in therapy: rehearsal of stressful situations. You have to convince your brain that events that make your anxiety act up aren't life-threatening at all, that it's thankfully not the whatever century back when you had to literally fight for survival, but just a standard event where you have to speak to some people.

All you have to do is rehearse, relax, think differently. While it is difficult to do and easy to say, these are the keys components that help with lessening the burden of glossophobia. If any of you struggle with it, and if it's overwhelming, please consult a specialist. And if you don't necessarily struggle with it but decided to take the time to educate yourself, thank you:).



unparalized
the sun that shines
right in front of my eyes
as i sit there softly humming
the melody that keeps on running
i stare at the screen with people
on the other side
what I'd give to be able
to do it outside

L.P.







