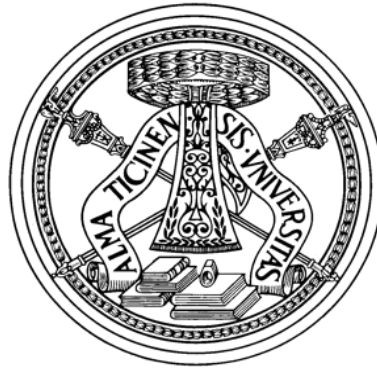




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2015/2016



Università degli Studi di Pavia
Economia Aziendale – Teoria del Controllo
Prof. Piero Mella

ANXIETY DISORDERS: AN EXPLANATION THROUGHOUT THE SYSTEMS THINKING

Introduction

*"Systems thinking is a discipline for **seeing wholes**. It is a framework for seeing **interrelationships** rather than things, for seeing patterns of change rather than static 'snapshots'... Today systems thinking is needed more than ever because we are becoming overwhelmed by complexity."*

(Peter Senge, The Fifth Discipline)

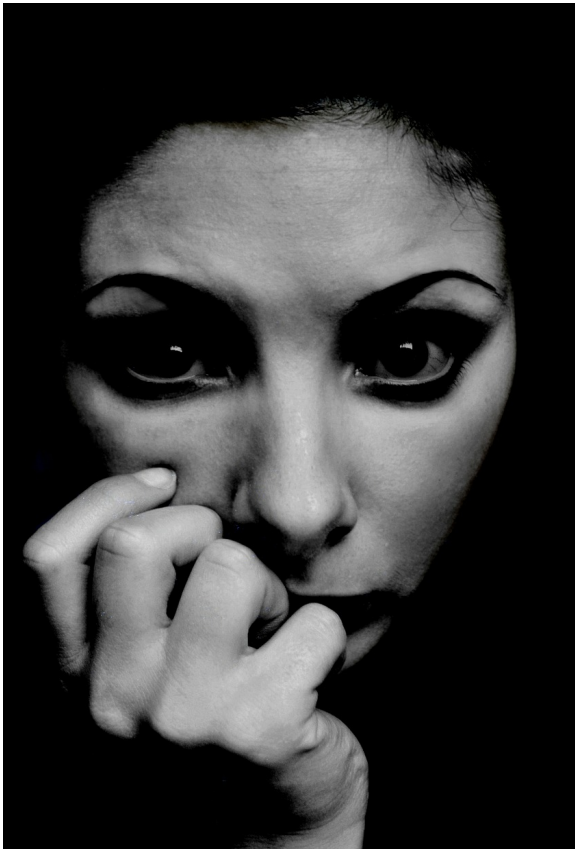
What is the intent of this presentation?

I haven't scientific or medic purpose making this presentation, of course, because I'm not a medic, expecially a psychiatrist. The information given in these work aren't technical, so if you think to be affected by some kind of deseases here descripted don't wast any time and go for a medic!

Even if I'm not a specialist I think that such a complicated thing like the world of **Anxiety Disorders** could be easilly illustrated throughout the language of **Systems Thinking**. We'll see that these disorders are connected each other and everyone of them is linked too others variables making a system.

What is Anxiety?

*“Anxiety, a feeling of dread, fear, or apprehension, often with no clear justification.
(Enciclopedia Britannica)”*



Have you ever felt a strange kind of feeling before an important happening? Like a test, a competition... or your marriage!

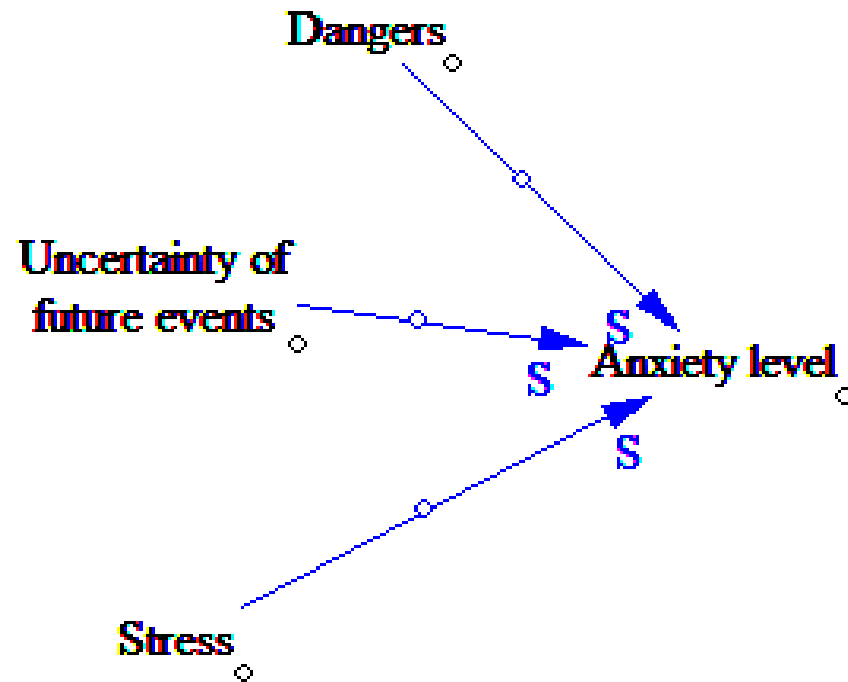
Have you ever felt some kind of fear standing in front of dangerous situation or in proximity of an uncertain event?

Well, that feeling is **Anxiety**.



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Anxiety looked throughout Systems Thinking: an example



What is Anxiety Disorder?

*“When anxiety occurs for seemingly no reason or in an exaggerated manner in response to relatively innocuous stimuli and disrupts a person’s life, an anxiety disorder may be diagnosed.
(Enciclopedia Britannica)”*

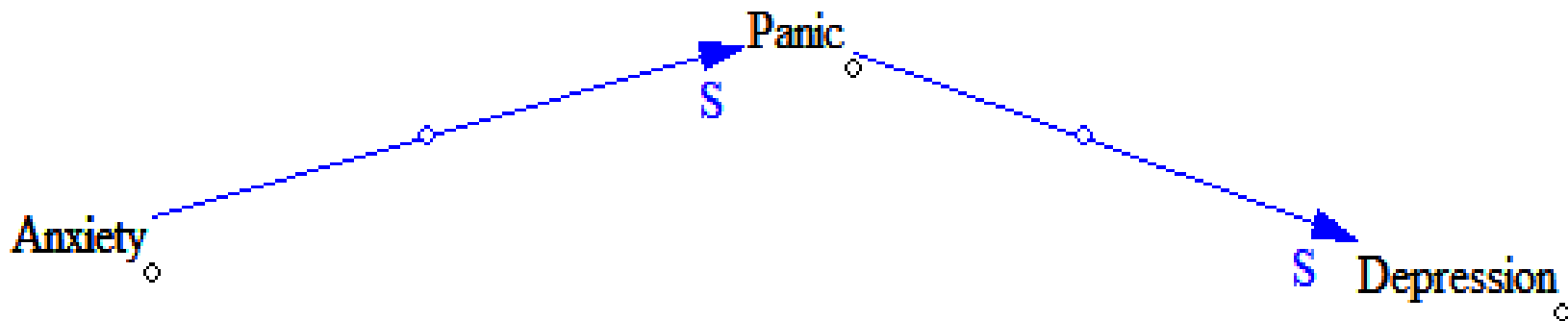
The “anxiety machine” works like a natural warning that keeps ourselves far from dangers.

But sometimes this machine doesn't work well and anxiety starts increasing over the normal level. In this case we feel too scared, stressed and our mind becomes to be paralyzed. We are in front an **Anxiety Disorder** and need the help of a specialized doctor.



Why we have to pay attention to anxiety?

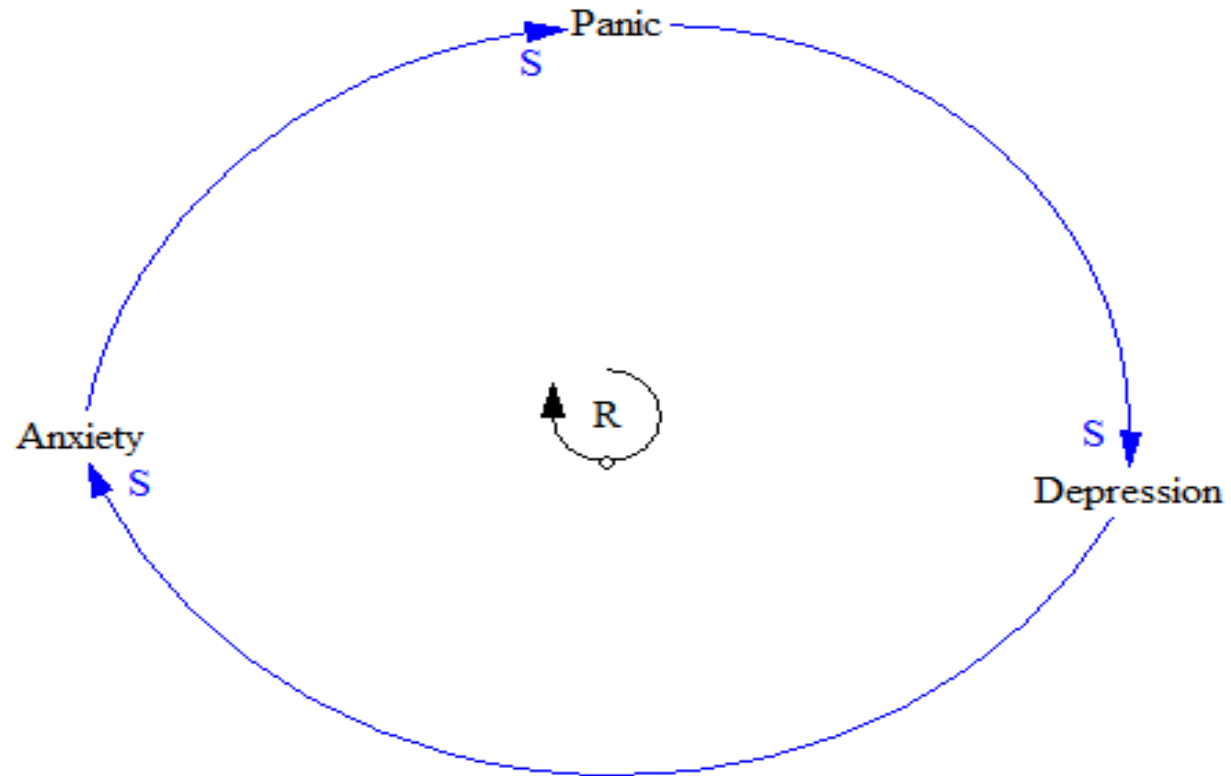
All the anxiety disorders seem trivial in a short-term period, but in the long-term period they could have very serious consequences.



Effectively a neglected anxiety disorder could cause more serious mental problems. **Our mind is a powerful but weak thing.**
Remember to keep it safe and secure.

Why we have to pay attention to anxiety? (pt. 2)

The causal chain we have already analyzed seems closed, finished. But if I say that it could easily become a CLD (Causal Loop Diagram)?



Effectively depression has negative effects on anxiety too. So we have easily created a **Reinforce Loop**, a vicious cycle that bring the patient affected by these problems down, and down...

Zooming in...

In the next steps we are going to zooming in trying to explain every single piece of this loop.

In the end we'll be able to see it like a system of different variables.



*“Dobbiamo vedere **gli alberi e la foresta.**
We have to look at **the trees and the woods.**
(P.Mella)”*



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Zooming in... Anxiety

Anxiety is closed in a R-CLD. At danger feeling growing, even anxiety grows, decreasing the mental serenity. But a mind less peaceful feels dangers stronger: here we have the loop.



External disturb:
Uncertainty of
environment

Start



Danger feeling

Anxiety

Mental serenity

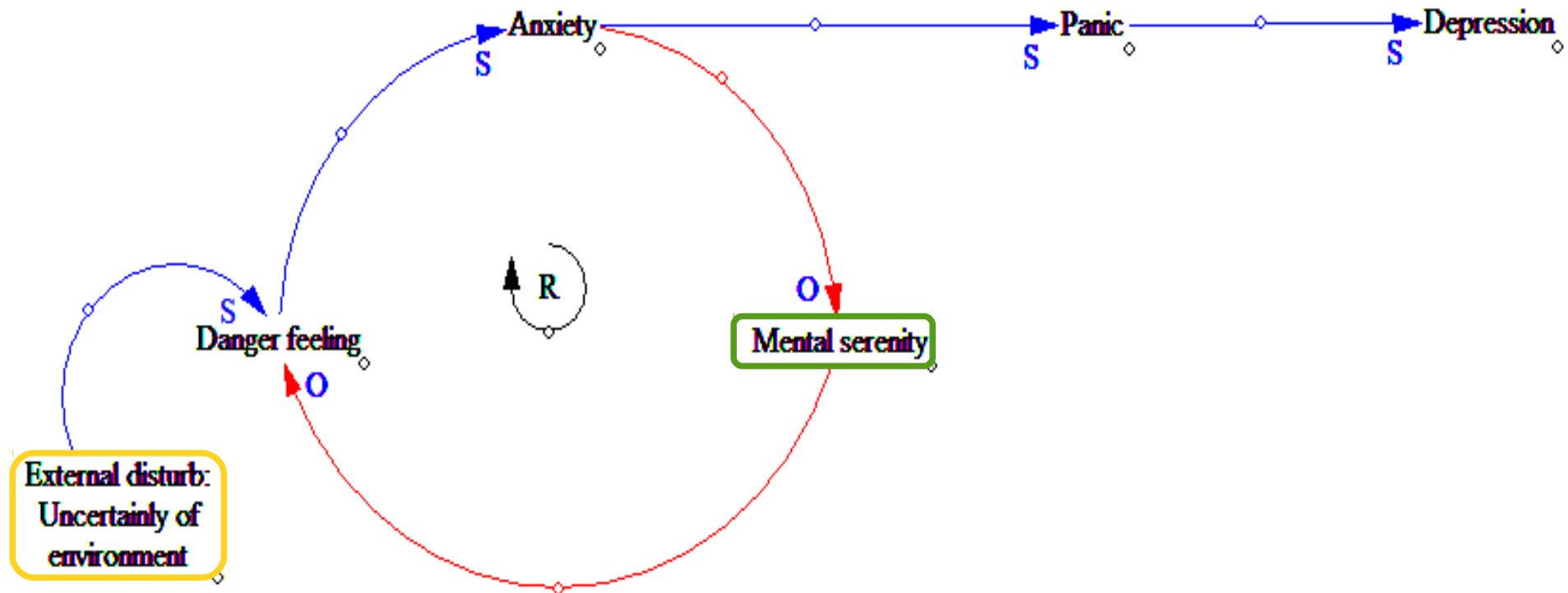
R



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Zooming in... Anxiety Disorders Loop. Step 1

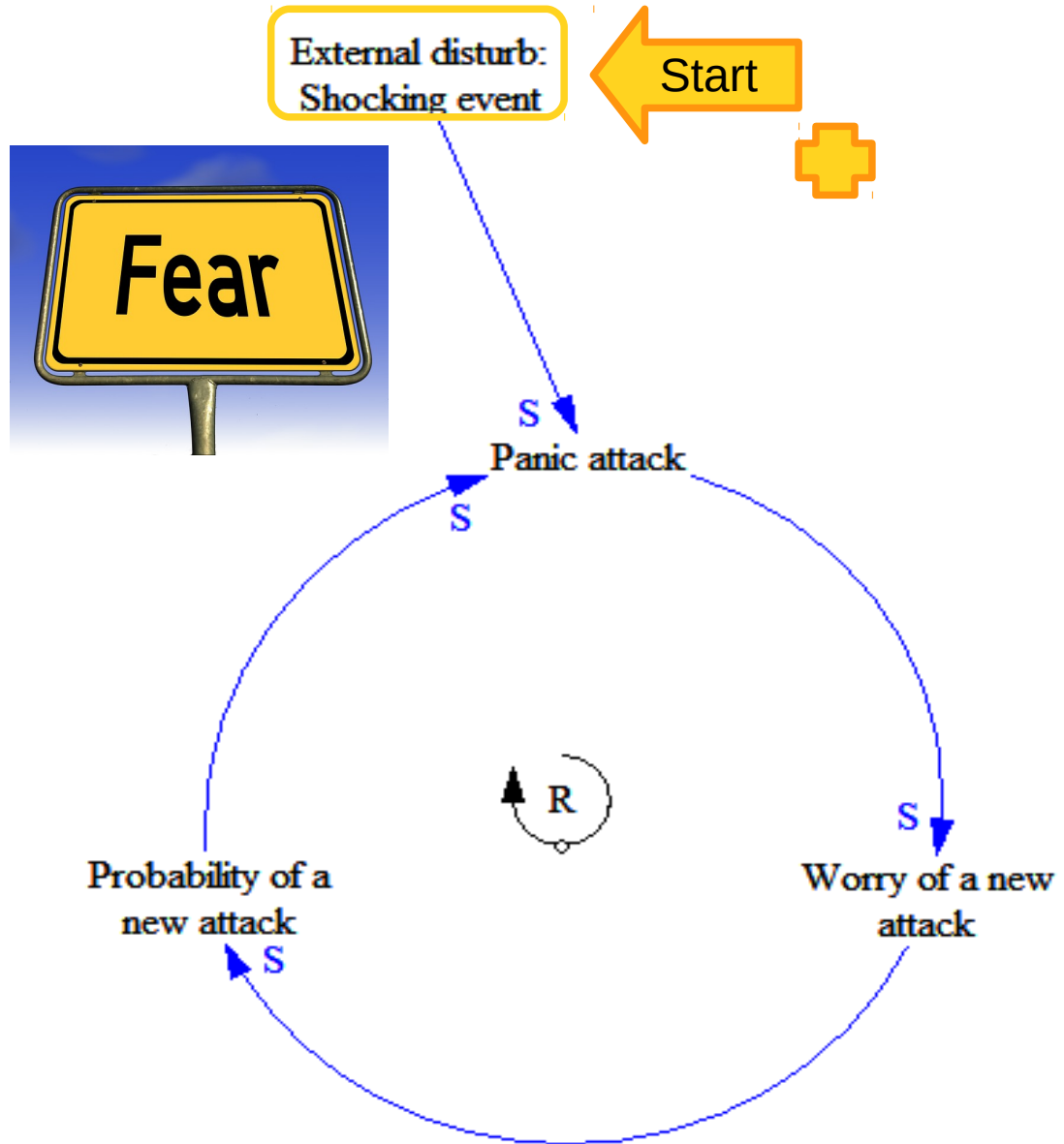
Let's put the anxiety loop in the chain seen before.



Zooming in... Panic Disorder

“Panic disorder, anxiety disorder characterized by repeated panic attacks... (Encyclopaedia Britannica)”

We have a strong anxiety and an external event is shocking us. The fear is so strong that we will ironically keep the fear of feeling the original fear! That's the **Panic disorder**, another R-CLD; another vicious cycle.

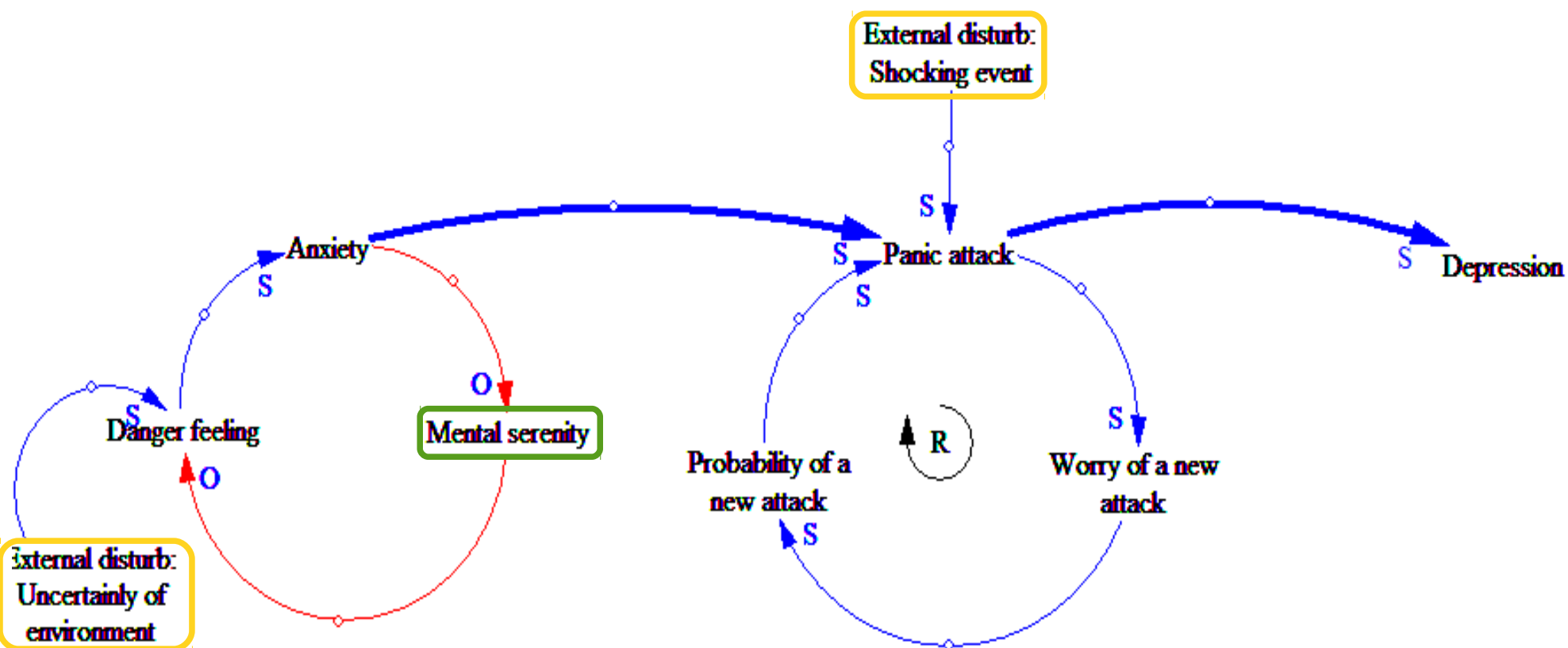




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Zooming in... Anxiety Disorders Loop. Step 2

Now let's put the panic loop in the chain seen before.



Zooming in... Depression

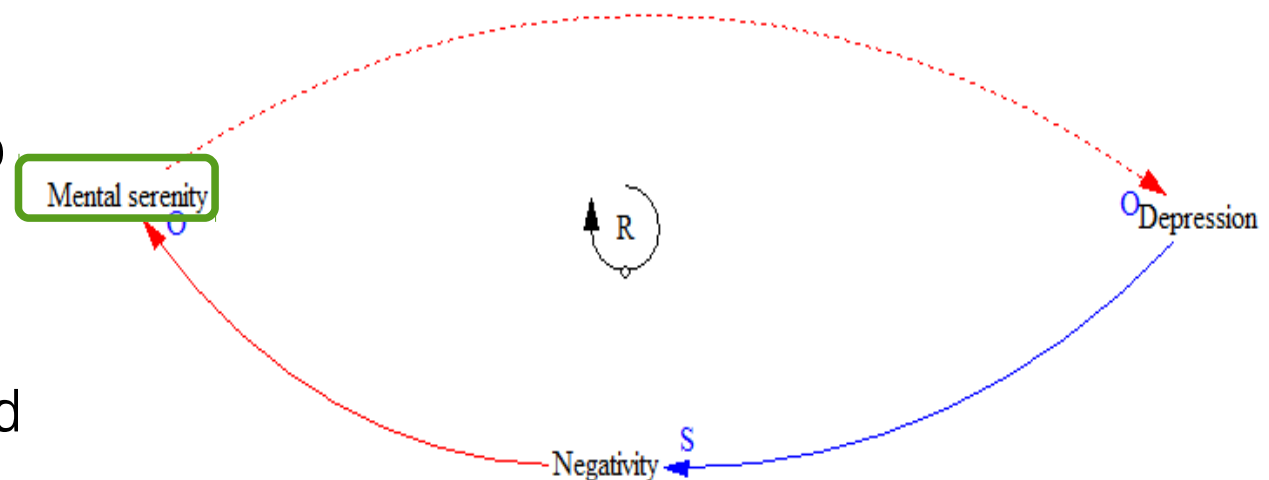
“Depression, in psychology, a mood or emotional state that is marked by feelings of low self-worth or guilt and a reduced ability to enjoy life. A person who is depressed usually experiences several of the following symptoms: feelings of sadness, hopelessness, or pessimism; lowered self-esteem and heightened self-depreciation; a decrease or loss of ability to take pleasure in ordinary activities; reduced energy and vitality; slowness of thought or action; loss of appetite; and disturbed sleep or insomnia..

(Encyclopaedia Britannica)”

Depression

includes a lot of symptoms. It's a very complicated disease; it's hard to explain.

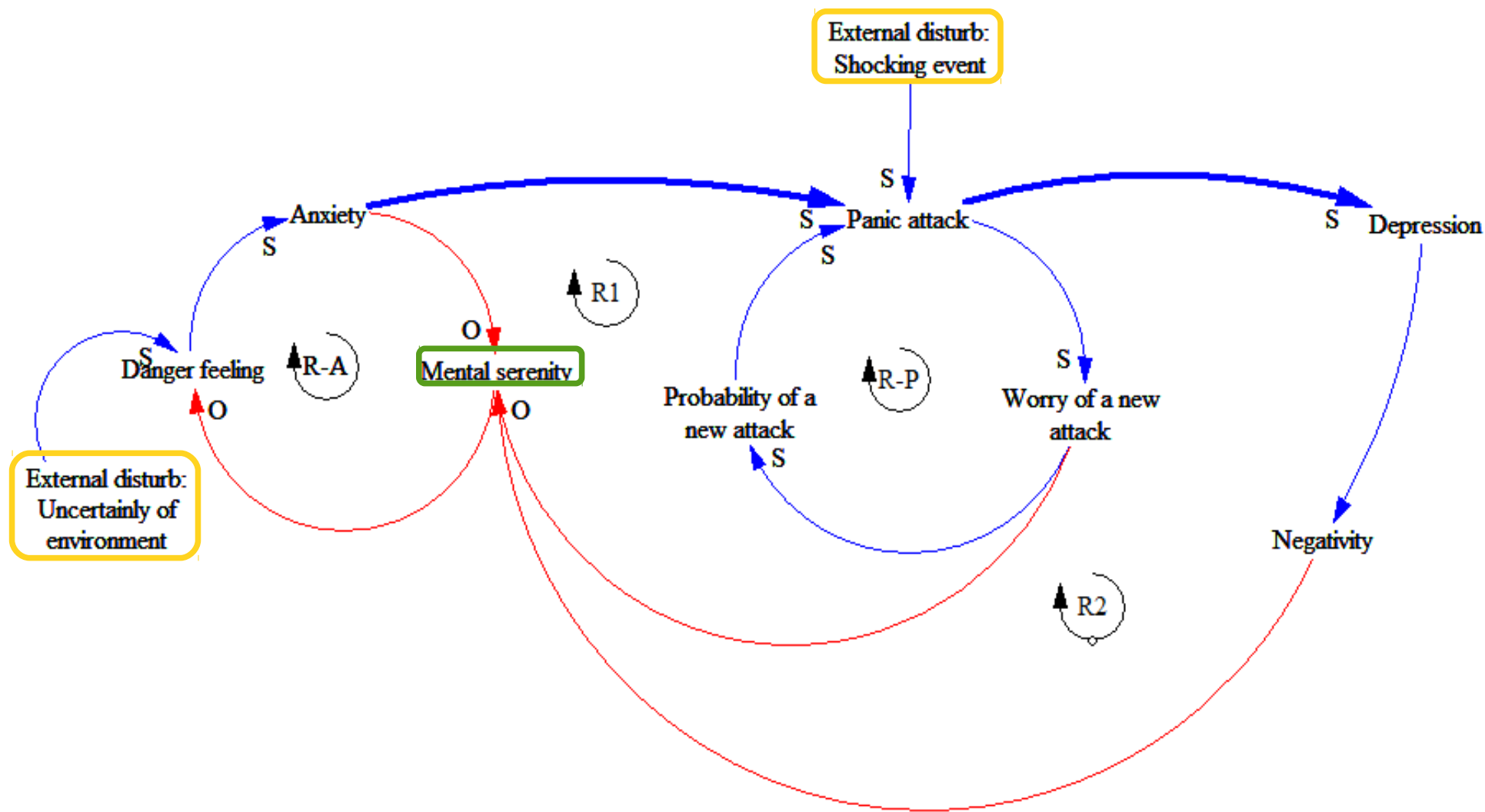
We'll use, for convention, the word “negativity” to include all its consequences.





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Zooming in... Anxiety Disorders Loop. Step 3



Zooming in... Anxiety Disorders Loop. Final Step

We passed from a causal chain to a System of Causal Diagram Loops:

- R-A : anxiety loop
- R-P : panic loop
- R1 : a loop that reinforce both anxiety and panic acting on mental serenity
- R2 : a loop that involves depression, anxiety and panic, acting on mental serenity another time

We passed from see the forest (the causal chain) to see the trees (the CLD in the system)

I could zoomin beyond, but I decide to set the limits here because i'm not an expert in this topic.

A medic could do. The medic qualified to treat these desease is the **psychiatrist** (that isn't “a person who deals with lunatics”...)

A possible aggravating factor: the OCD

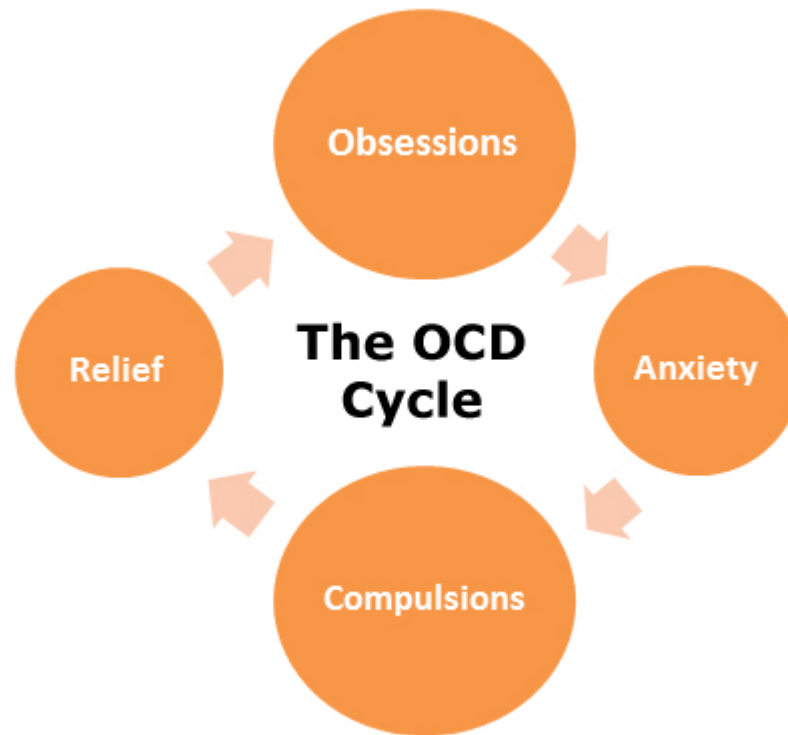
We have analyzed some of the most common anxiety disorders, but this kind of disease are much more.



One of the most famous of these disease is the Obsessive Compulsive Disorder, best known as OCD.

The OCD Cycle

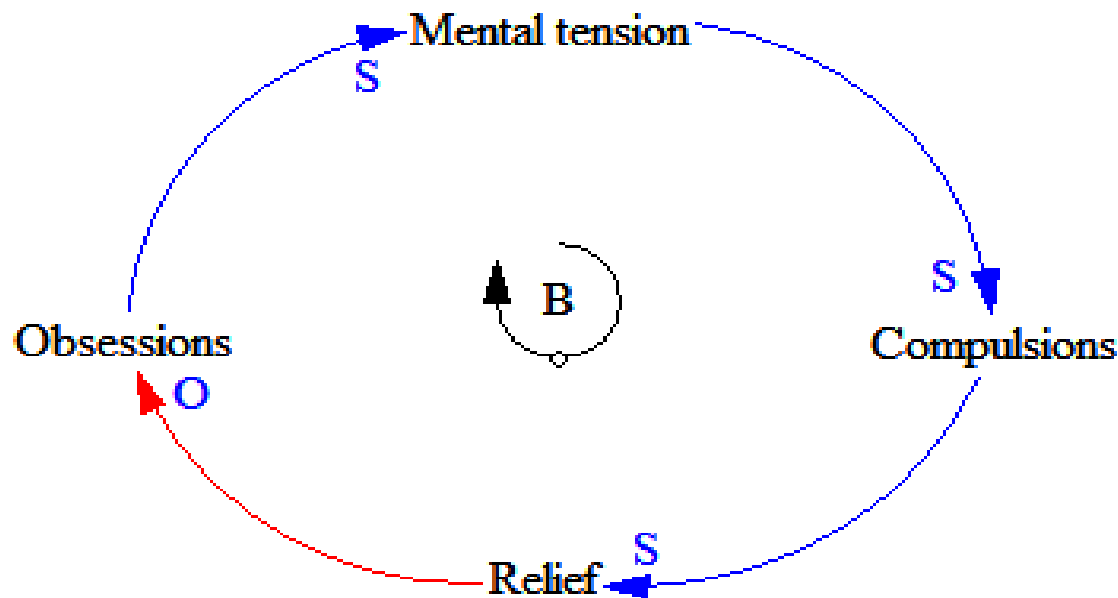
OCD works very simply. The more are the compulsions made to stop the obsessions, the more are new and stronger obsessions.



The OCD Cycle seems a CLD, but it isn't. There are no sense on the arrows, so we can't tell if it is a reinforce or a balance loop. But a medic will always illustrate you OCD using this diagram.

The OCD as a CLD

The OCD Cycle isn't wrong, but it isn't a CLD so we can't talking about Systems Thinking. Here there is a CLD similar at OCD Cycle (we only changed “anxiety” with the variable “mental tension”)



Now we have a balance loop showing how OCD work in the **short term**, giving relief throughout compulsions (fisical or mental).

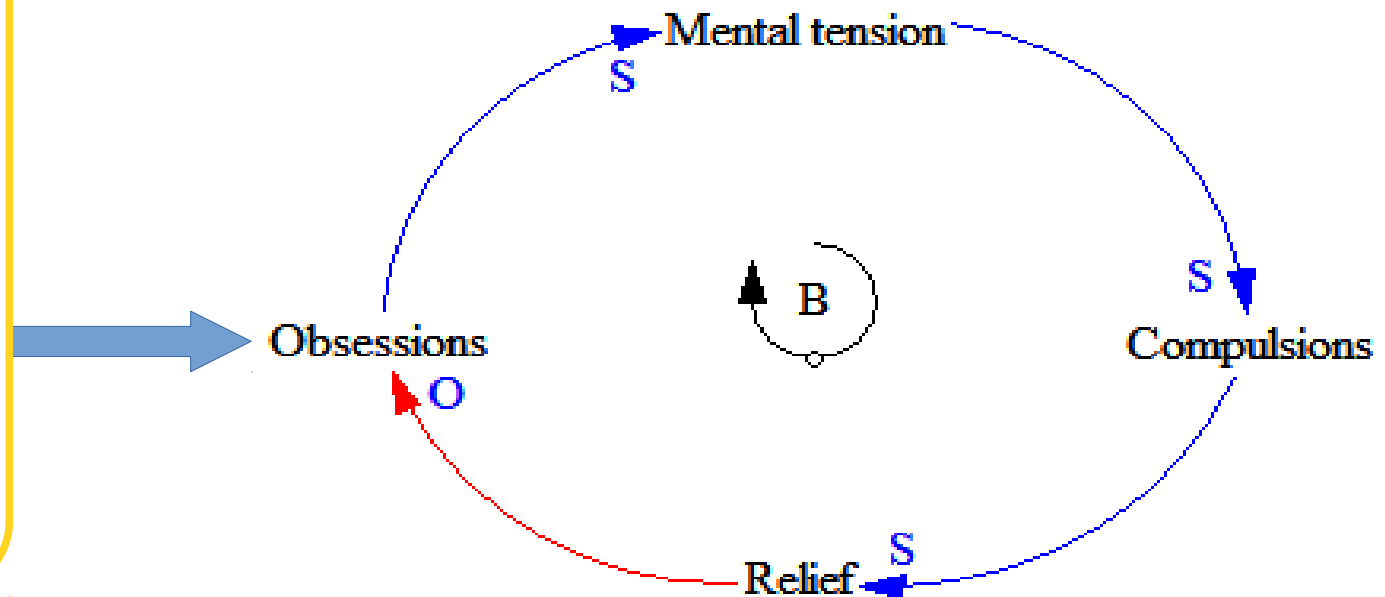
How obsessions starts?

This is a very tricky question: we can use Socrates' words:

"Wise the one who knows to know nothing"



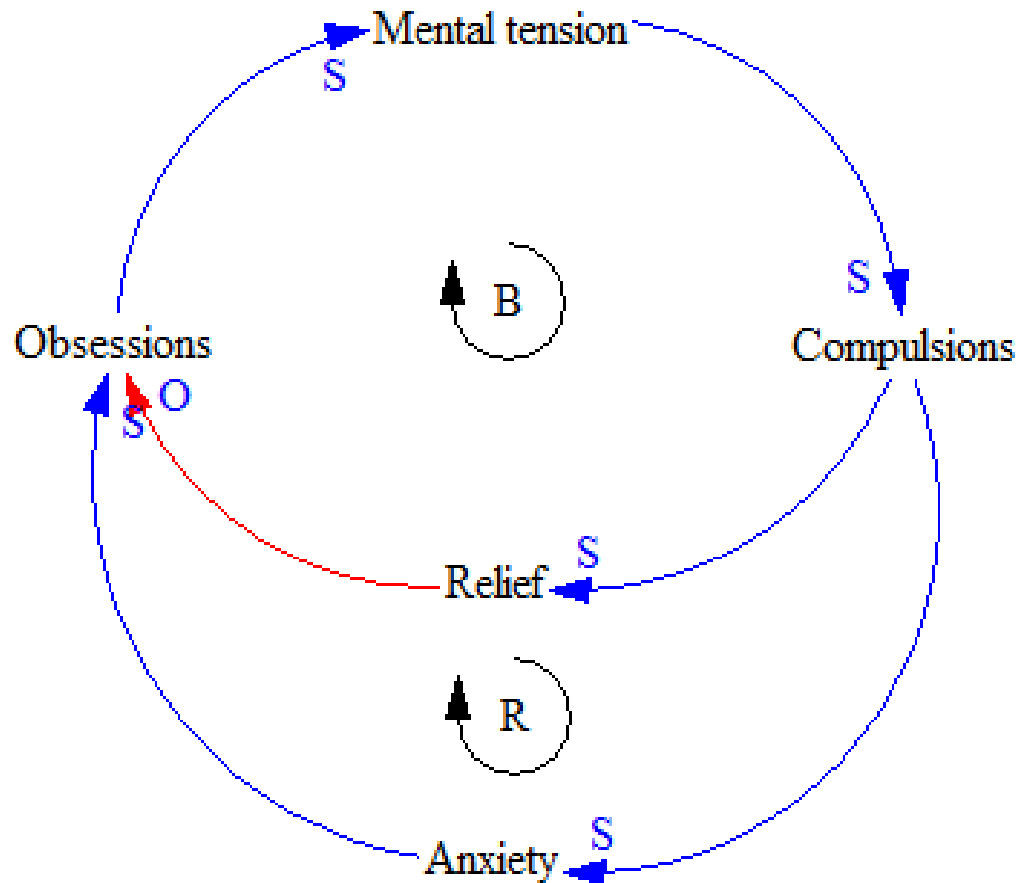
Pathological Doubt



The doubt is inside every mind. It's the heart of knowledge and culture. When it becomes disturbing, annoying and worthless we could consider it pathological. In this case it generates obsessions.

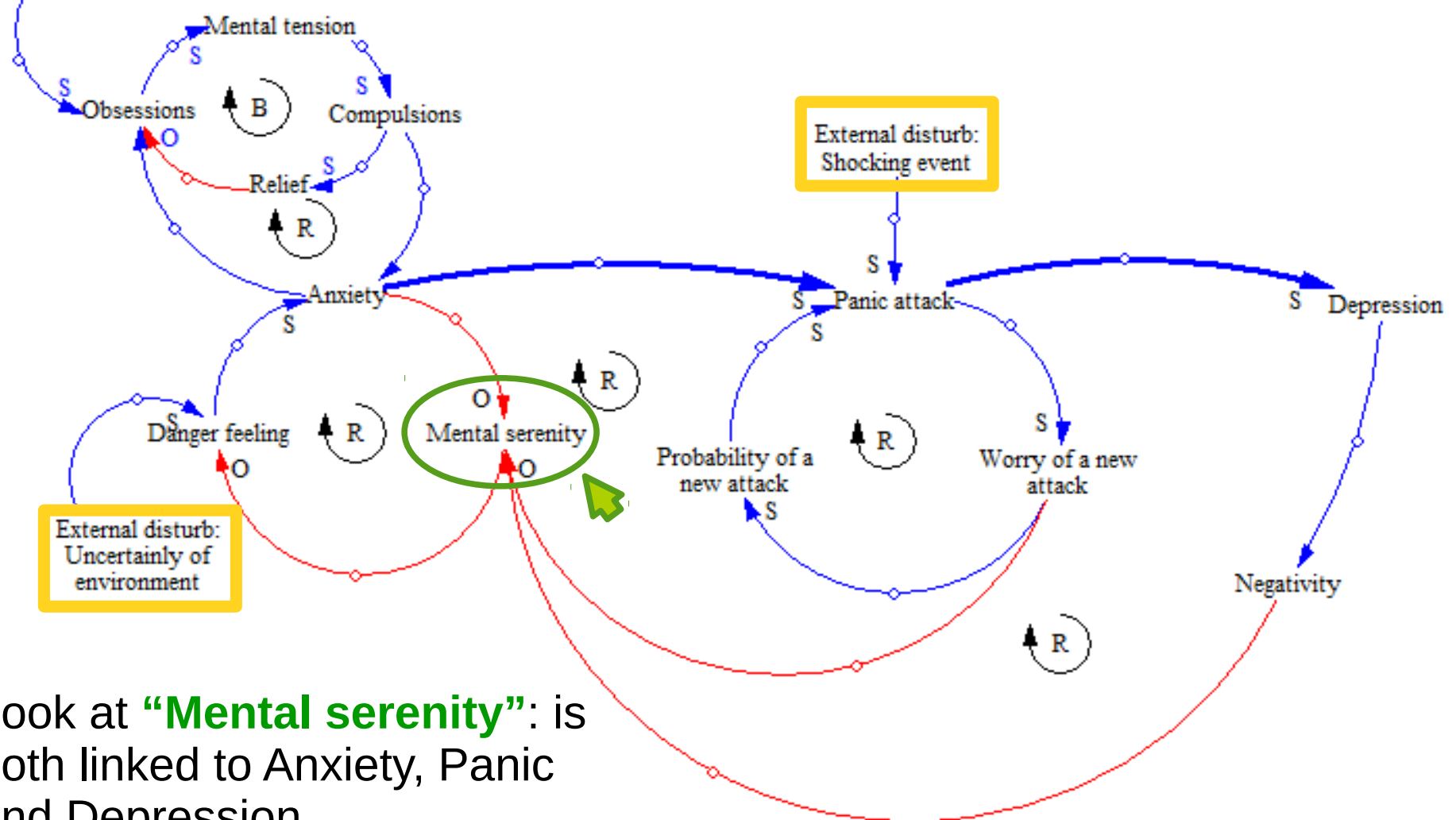
The OCD as a CLD

But what happens in the long term? Let's zoom out...



The perpetuated using of compulsions isn't a healthy practice because they work by limiting anxiety on the start. Time after time anxiety is contained and “stored” (I use this simple language trying to explain a very complicated concept) and it rises, and rises, and rises... and explodes like a bomb. But a state of more anxiety means a breeding ground for new and stronger obsessions. So another vicious cycle can start.

Pathological doubt



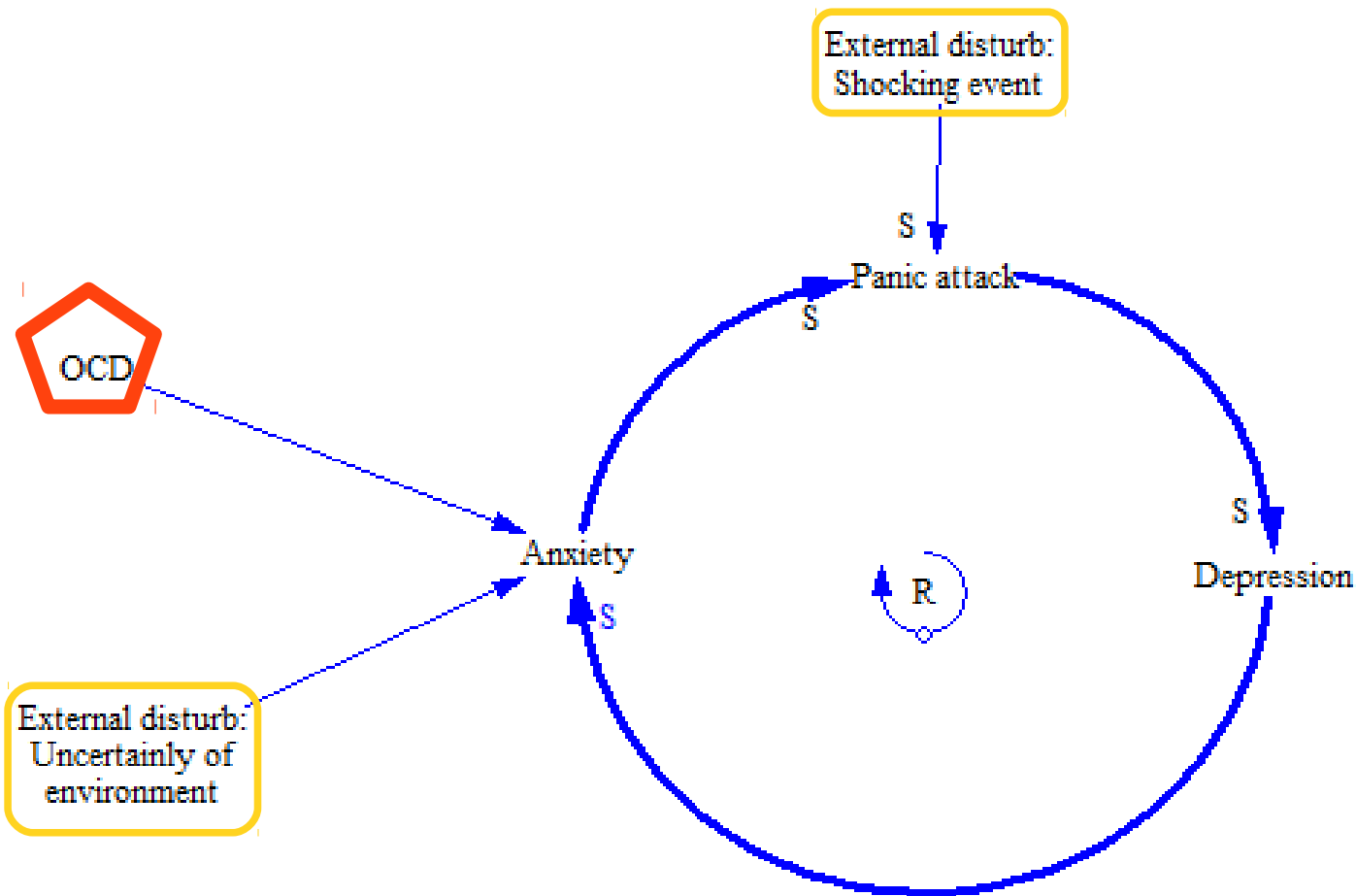
Look at “**Mental serenity**”: is both linked to Anxiety, Panic and Depression.



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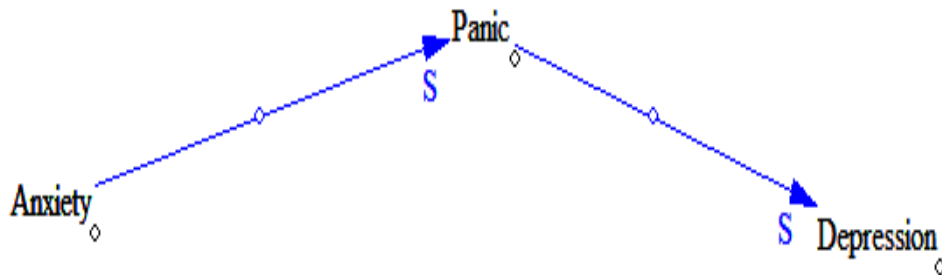
Zooming out... Anxiety Disorders Loop.

Let's look back at the forrest from seeing trees.



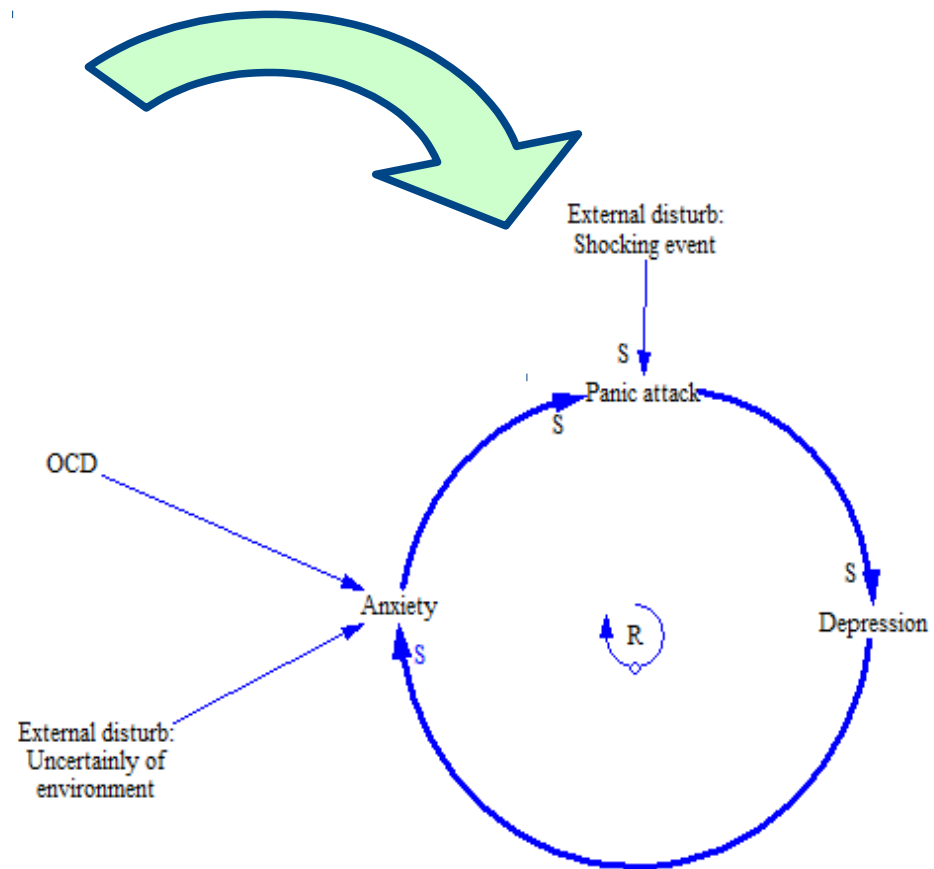
Ending. Anxiety Disorders and Systems Thinking

We started from a simple causal chain...



...and finished to a CLD with external disturbs, aggravations, etc...

That's how Systems Thinking works! Looking both “forrests” and “trees” and selecting the borders and the way to go on.

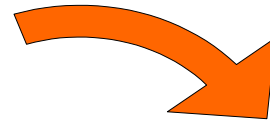




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Some topics I wanna talk about...

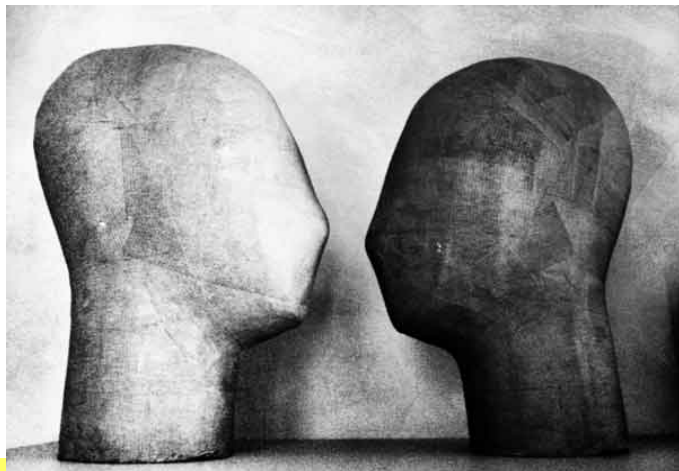
*That's how **SYSTEMS THINKING** works!
Looking both
"forrests" and "trees"
and selecting the
borders and the way
to go on.*



How can we "heal" these disorders using Control Systems?

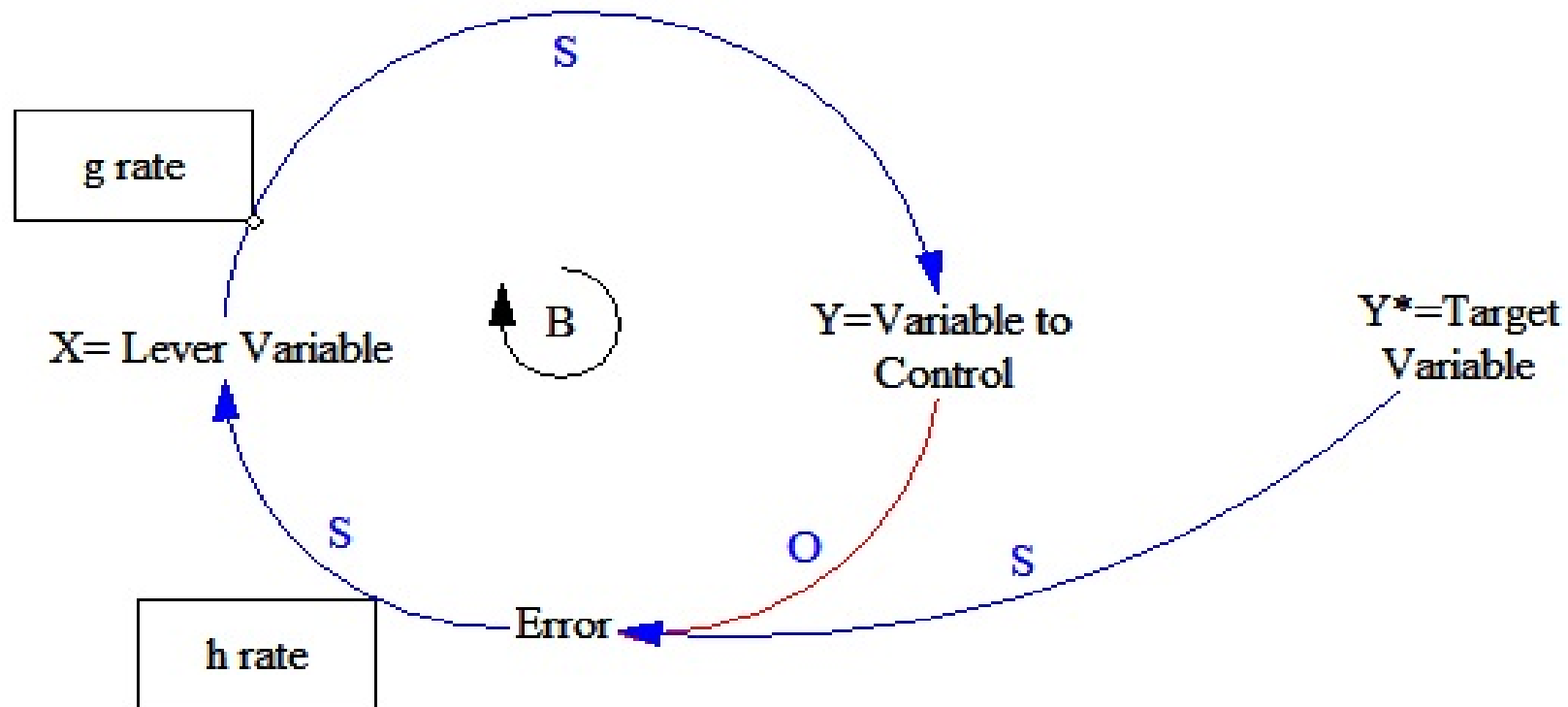
&

The Bipolar Disorder



ATTACHMENT n°1: healing Anxiety Disorders by Control Systems.

This is a Control System Loop (basically it works like a B-CLD)
Now let's see how these loops help (if well-used) to heal Anxiety Disorders

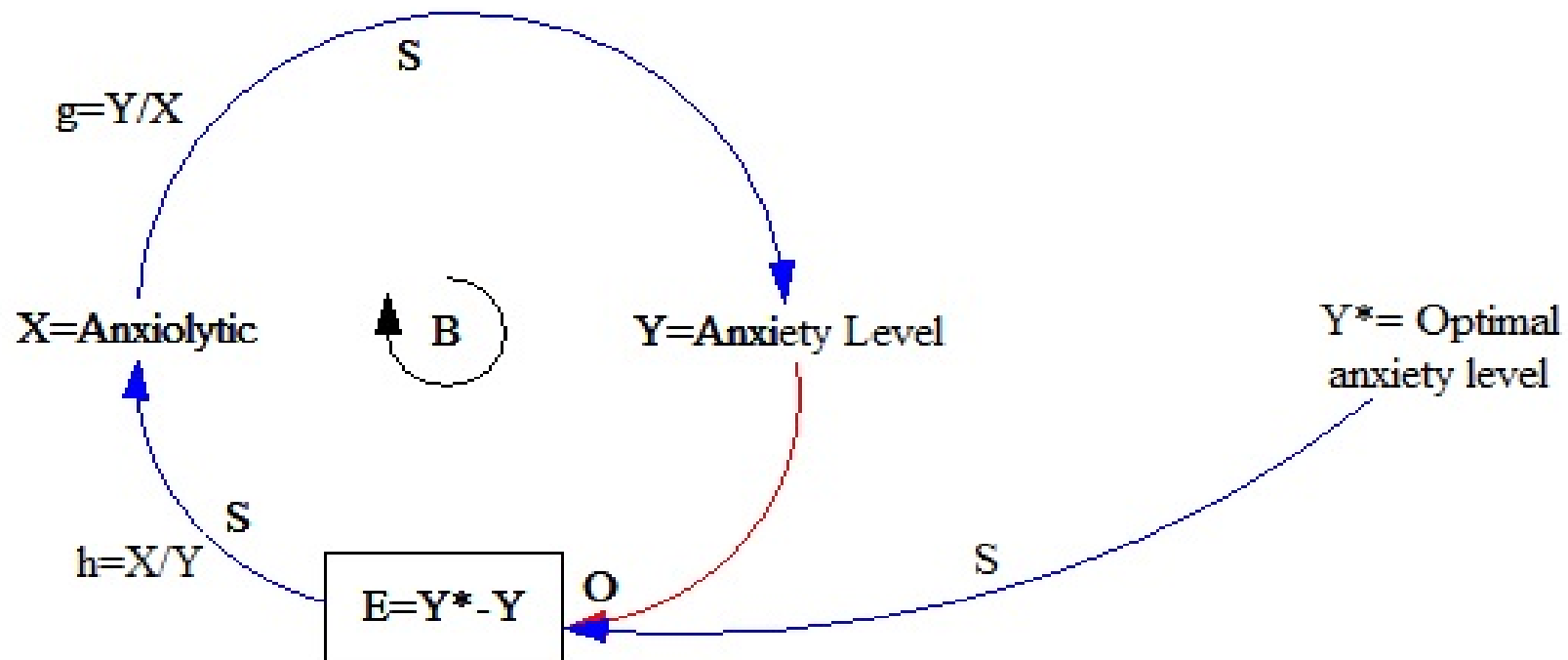


ATTACHMENT n°1: Control Systems on Anxiety Problem

If we feel Anxiety (Y) we want to feel better lowering Anxiety Level to a target (Y^*)

What leverage do we use to reach the target?

For example we can use as leverage Anxiolytics (X)





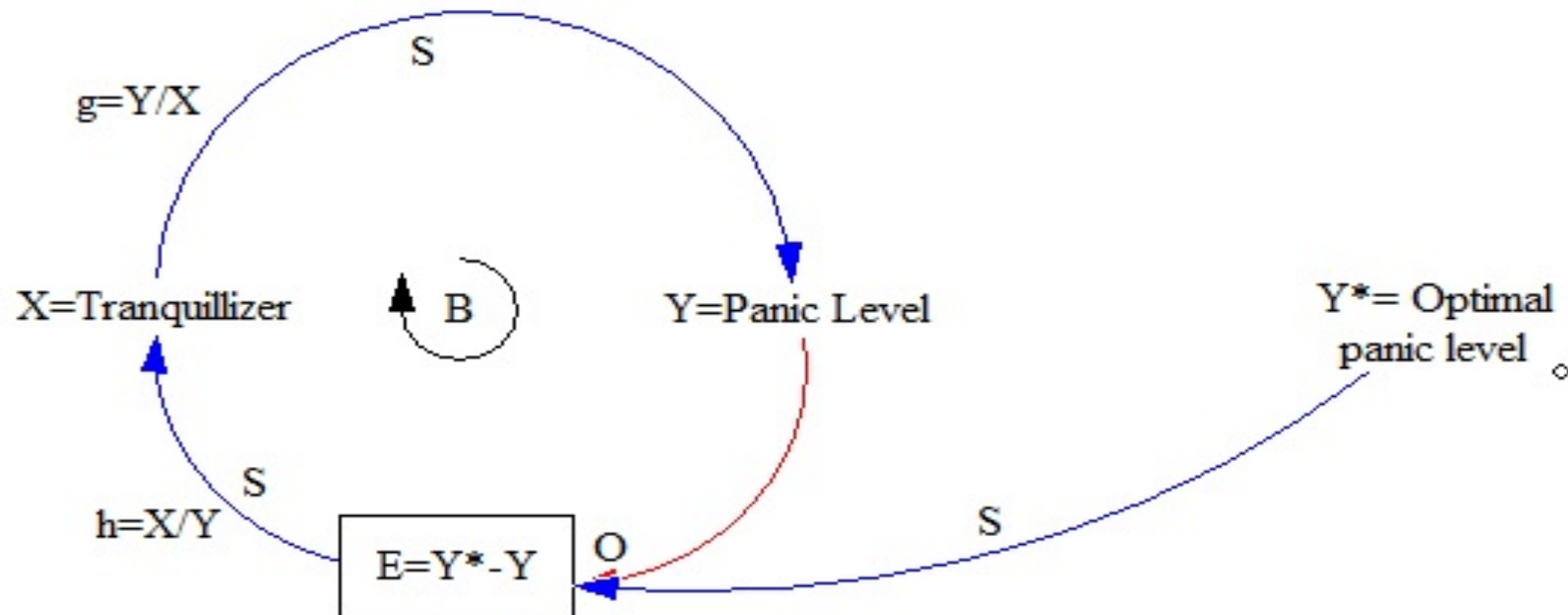
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ATTACHMENT n°1: Control Systems on Panic Attack

If we have an high level of panic(Y) we risk a Panic Attack. If We wanna not fall into it we must reach an optimal and acceptable panic level(Y^*)

What leverage do we use to reach the target?

For example we can use as leverage Tranquillizers (X)





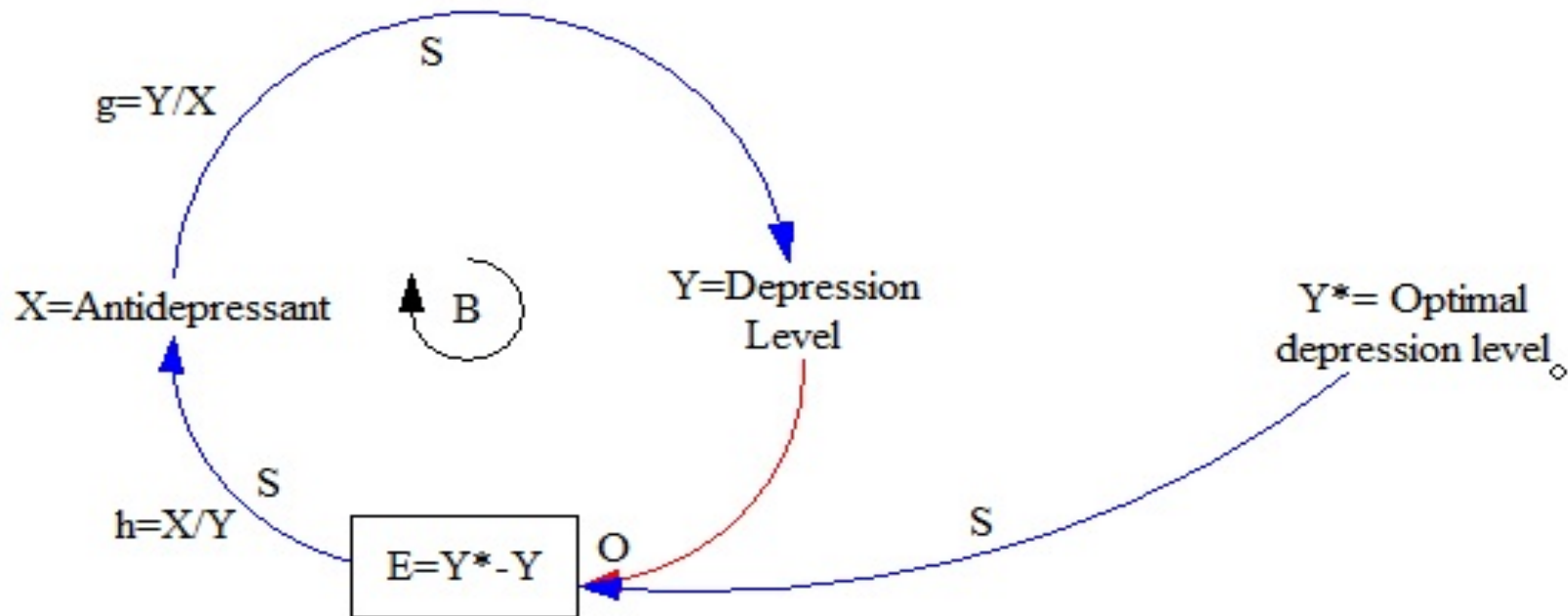
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ATTACHMENT n°1: Control Systems on Depression

If we feel highly depressed (Y) we risk a strong clinical depression. If we want not to fall into it we must reach an optimal and acceptable “depression level”, knowing that these are inaccurate words (Y^*)

What leverage do we use to reach the target?

For example we can use as leverage Antidepressants (X)



ATTACHMENT n°1:are always Control Systems Effective?

The last 3 examples seems
basically effective...
But it's really the right way?



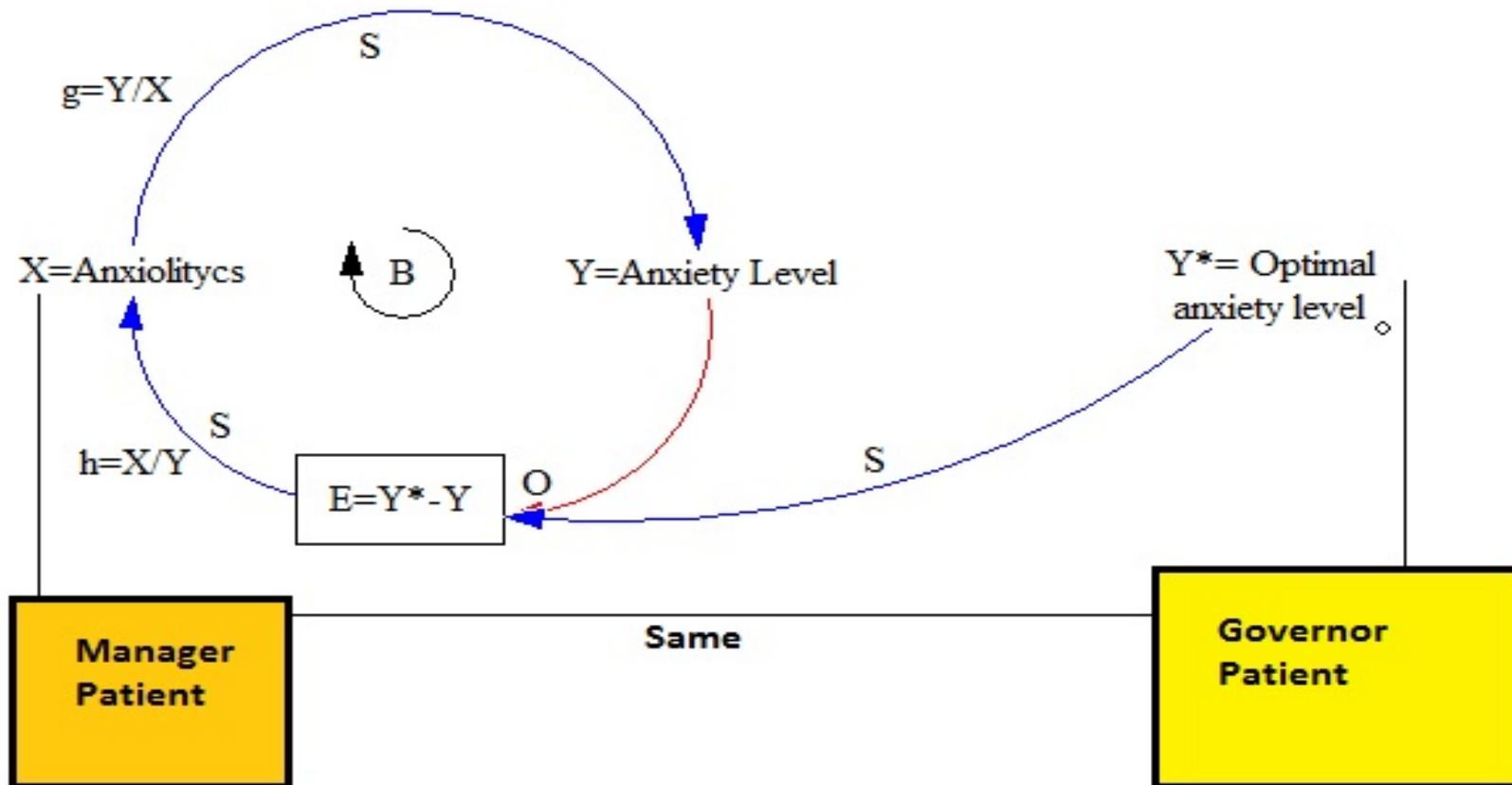
Let's look inside some examples
and try to keep wholes' vision



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ATTACHMENT n°1: Symptomatic Control on Anxiety

If we feel Anxious (Y) we'll take some drops of Anxiolytics (X) and, in the short term, we feel better. But in the long term? The numbers of Anxiolytics drops rise, and rise... (Do you remember ODC loops?)

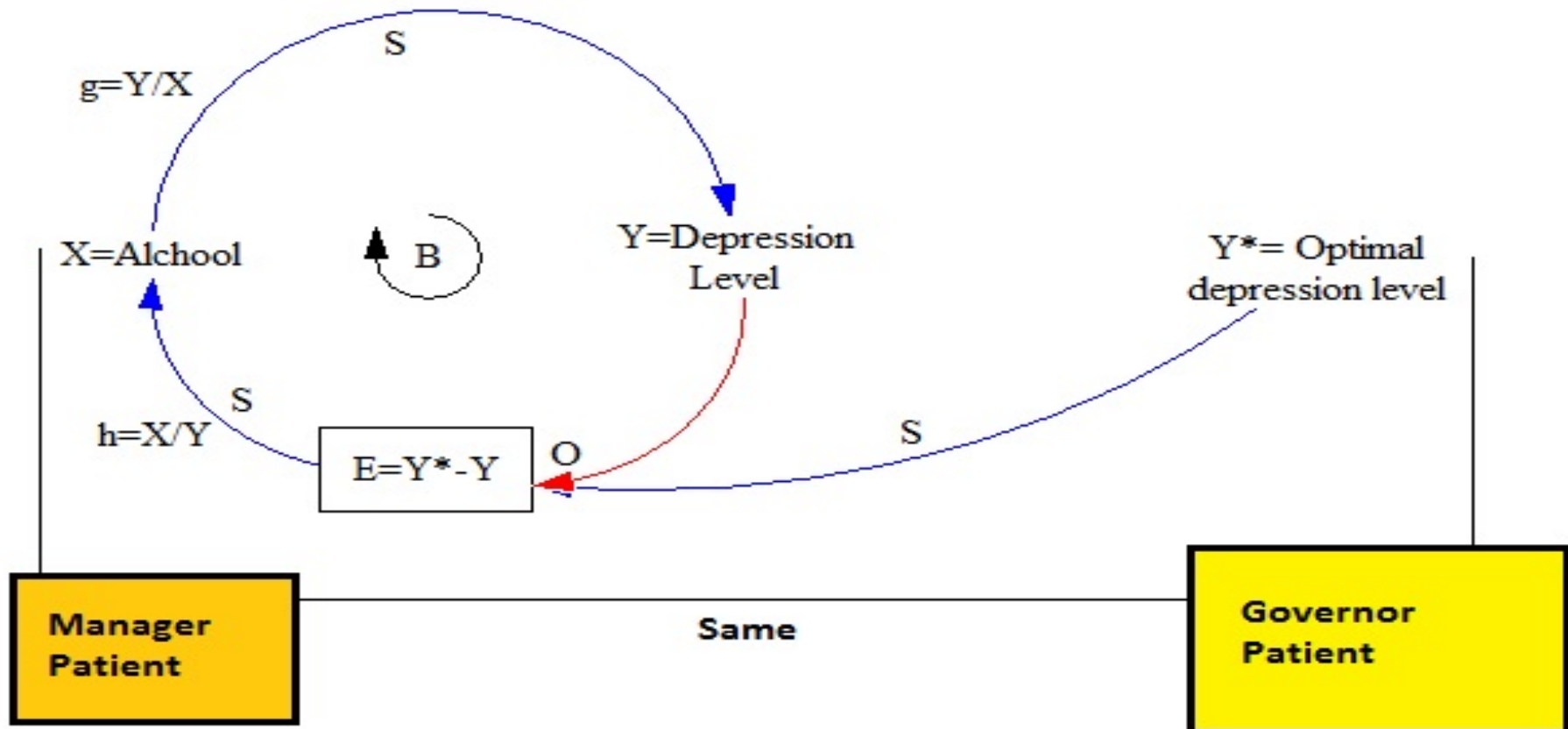




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ATTACHMENT n°1: Symptomatic Control on Depression

If we feel Depressed (Y) we'll feel better using some “improper” methods like Alcohol (or Drugs) (X) and, in the short term, we feel better. But in the long term? The numbers of Alcohol used (and abused) rise, and rise...

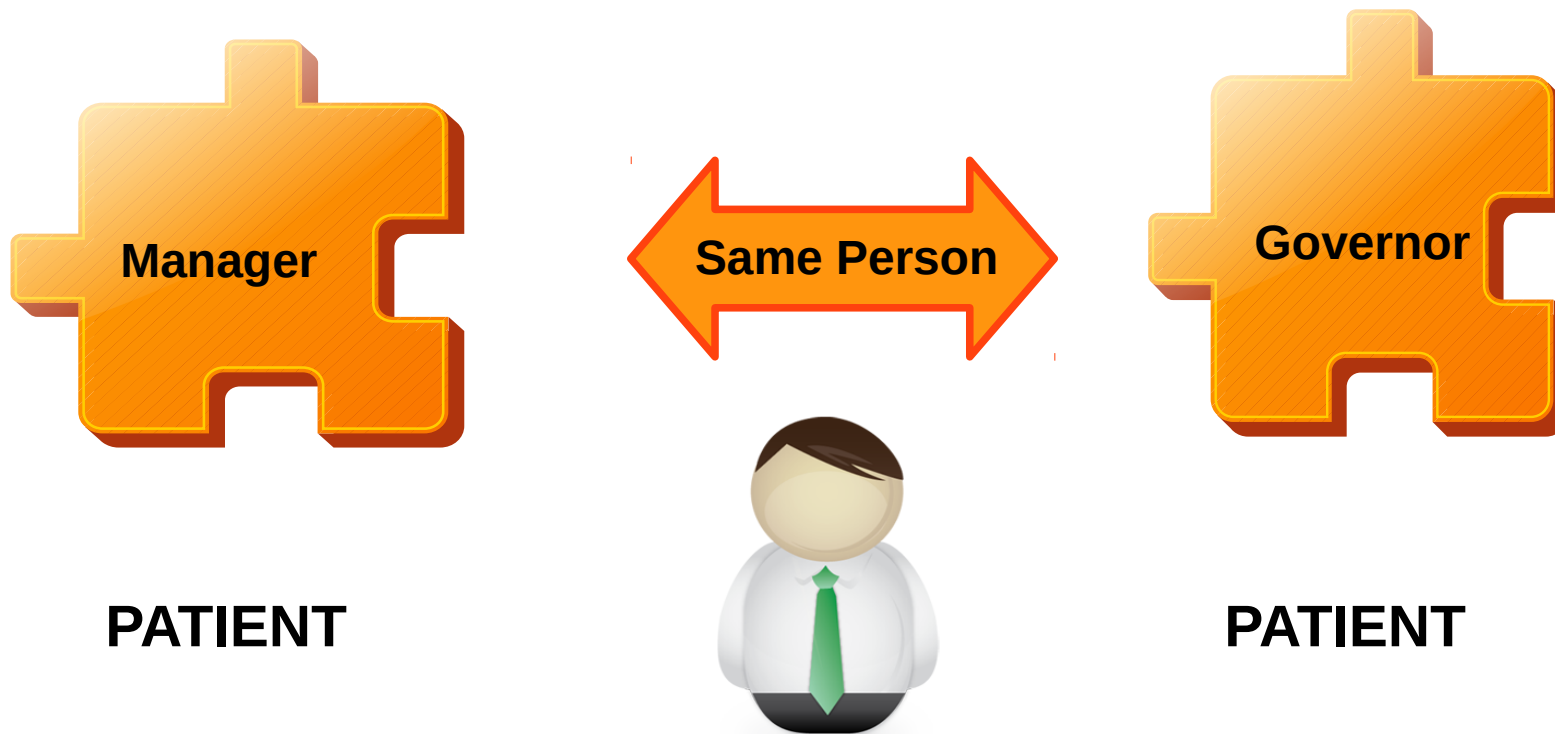




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ATTACHMENT n°1: Symptomatic Control

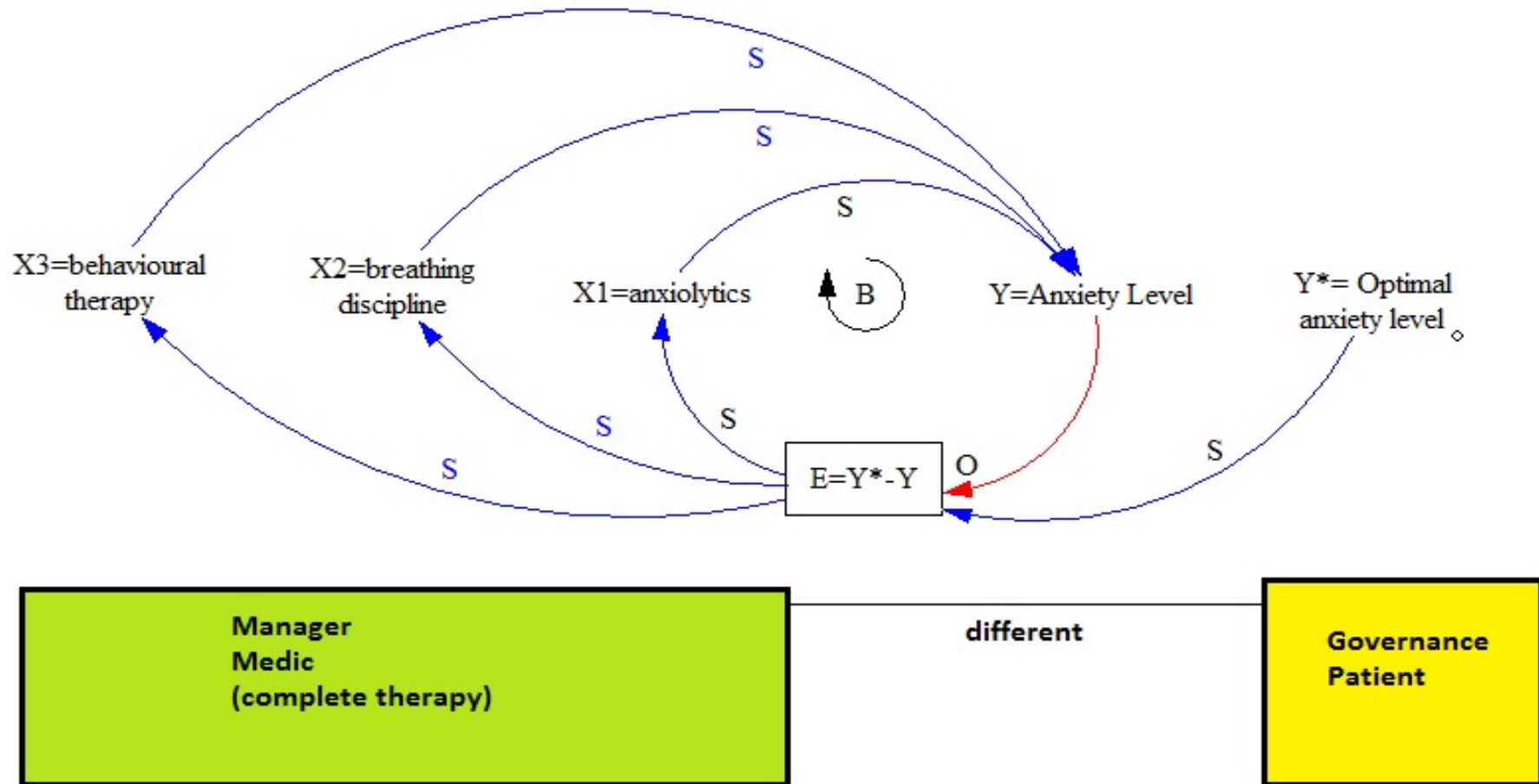
Do you see anything “strange”?





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ATTACHMENT n°1: Healing the Anxiety

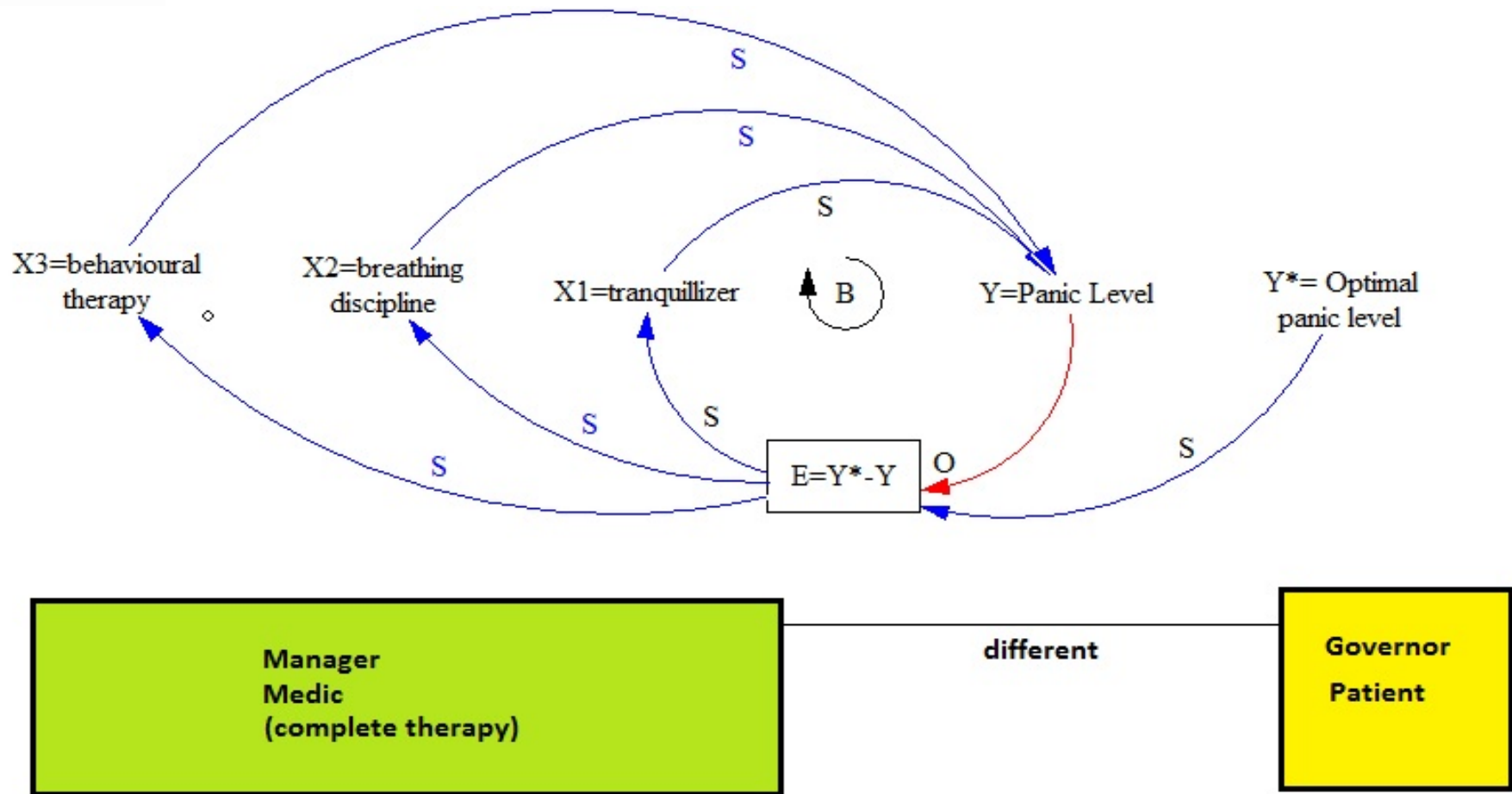


If you feel Anxious go for a Medic who can set up a therapy right for you. A therapy is a “Multi-Leverage” System working concurrently to heal the disease.



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ATTACHMENT n°1: Healing the Panic



If you feel in panic go for a Medic who can set up a therapy right for you. A therapy is a “Multi-Leverage” System working concurrently to heal the disease.



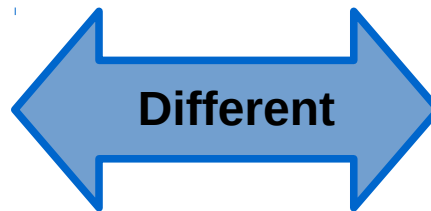
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ATTACHMENT n°1: Symptomatic Control

Do you see anything “strange” anymore?



MEDIC



PATIENT

When Patient acts like a Medic everything usually goes wrong!
When a Medic set up a (right) therapy the Patient could be recovered!

ATTACHMENT n°2: the Bipolar Disorder

*There are several types of bipolar disorder, in which the states of mania and depression may alternate cyclically, one mood state may predominate over the other, or they may be mixed or combined with each other.
(Enciclopedia Britannica)"*



Sometimes we feel happy.
Sometimes we feel sad.

It doesn't mean we are
suffering of bipolar disorder!

We're talking about a
serious disease that
appeared several times in
the human history...



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ATTACHMENT n°2: the Bipolar Disorder in the History

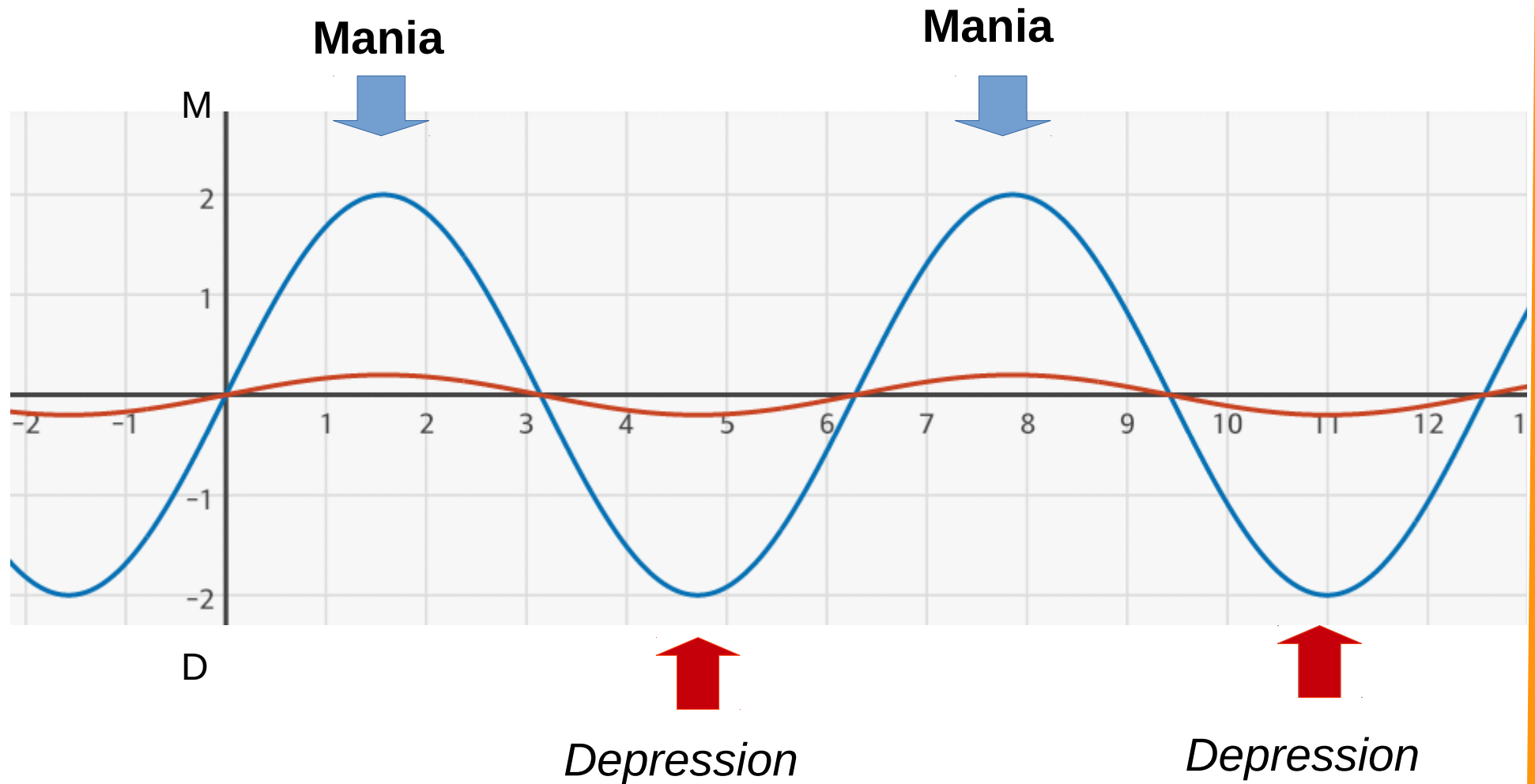
- ✓ Jim Carrey
- ✓ Axl Rose
- ✓ Kurt Cobain
- ✓ Paul Gascoigne
- ✓ Mel Gibson
- ✓ Catherine Zeta-Jones
- ✓ **WINSTON CHURCHILL**
- ✓ Ernest Hemingway
- ✓ Edvard Munch
- ✓ Sinéad O'Connor
- ✓ Jaco Pastorius
- ✓ **LUDWIG VON BEETHOVEN**
- ✓ Edgar Allan Poe
- ✓ Lou Reed
- ✓ Elvis Presley
- ✓ **NAPOLEON BONAPARTE**
- ✓ Nina Simone
- ✓ Frank Sinatra
- ✓ Vincent van Gogh
- ✓ Ben Stiller



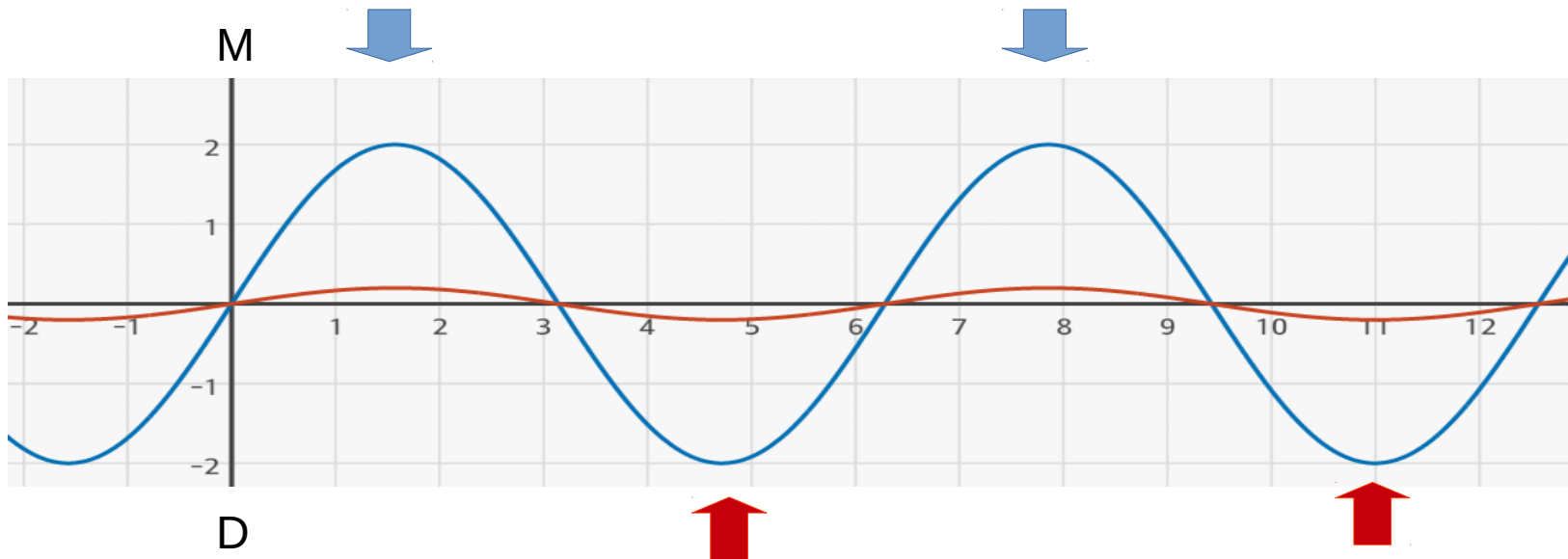


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ATTACHMENT n°2: How works the Bipolar Disorder



ATTACHMENT n°2: How works the Bipolar Disorder



We have peaks of Mania and Depression that cannot be erased. How can we make the bipolar patient feel better? **We could control the blue sinusoid “pushing down” the peaks.** The target is reach the state described by the red thin sinusoid (in medical words this line describe the state of a **Normotimic** Person, i.e. a person like you, sometimes feeling better, sometimes feeling worse)

ATTACHMENT n°2: How to “heal” the Bipolar Disorder



*“I'm so happy 'cause today
I found my friends
They're in my head
I'm so ugly, but that's okay, 'cause so are you
(Lithium, Kurt Cobain, Nirvana)”*

The most common way to reach the normotimy is to sumministrare **one of the first three elements sprung by the Big Bang: the Lithium**. This salt must be considered like insuline for a diabetic patient: the bipolar affected person have to take this salt all along his life to keep away the states of mania and depression. Lithium was known even by ancient romans, that heals mania state in some thermal waters rich of them in the Po Valley.

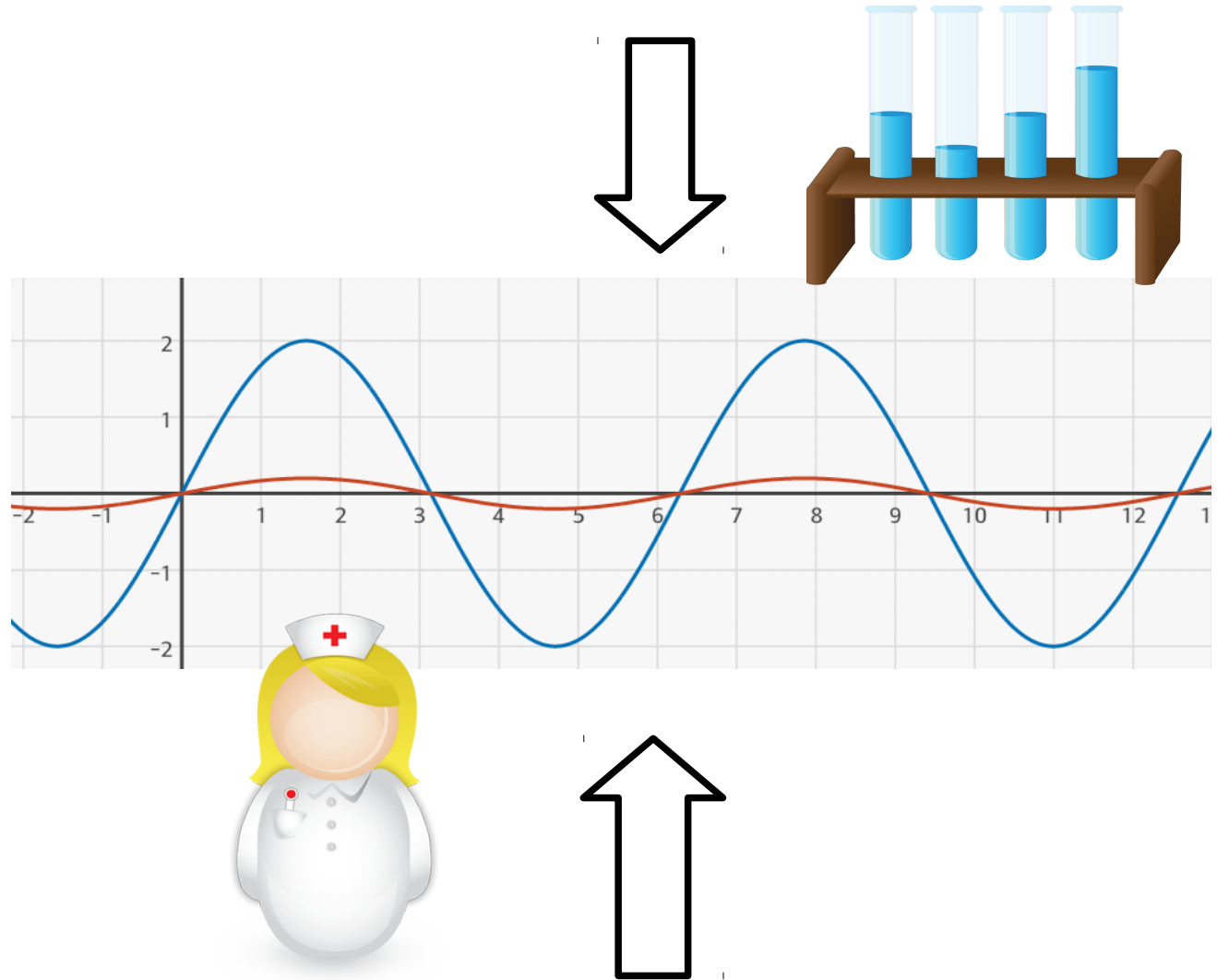


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ATTACHMENT n°2: How works the Bipolar Disorder

Is there any **Control System** in giving the right amount of lithium to **Control** the bipolar disorder?

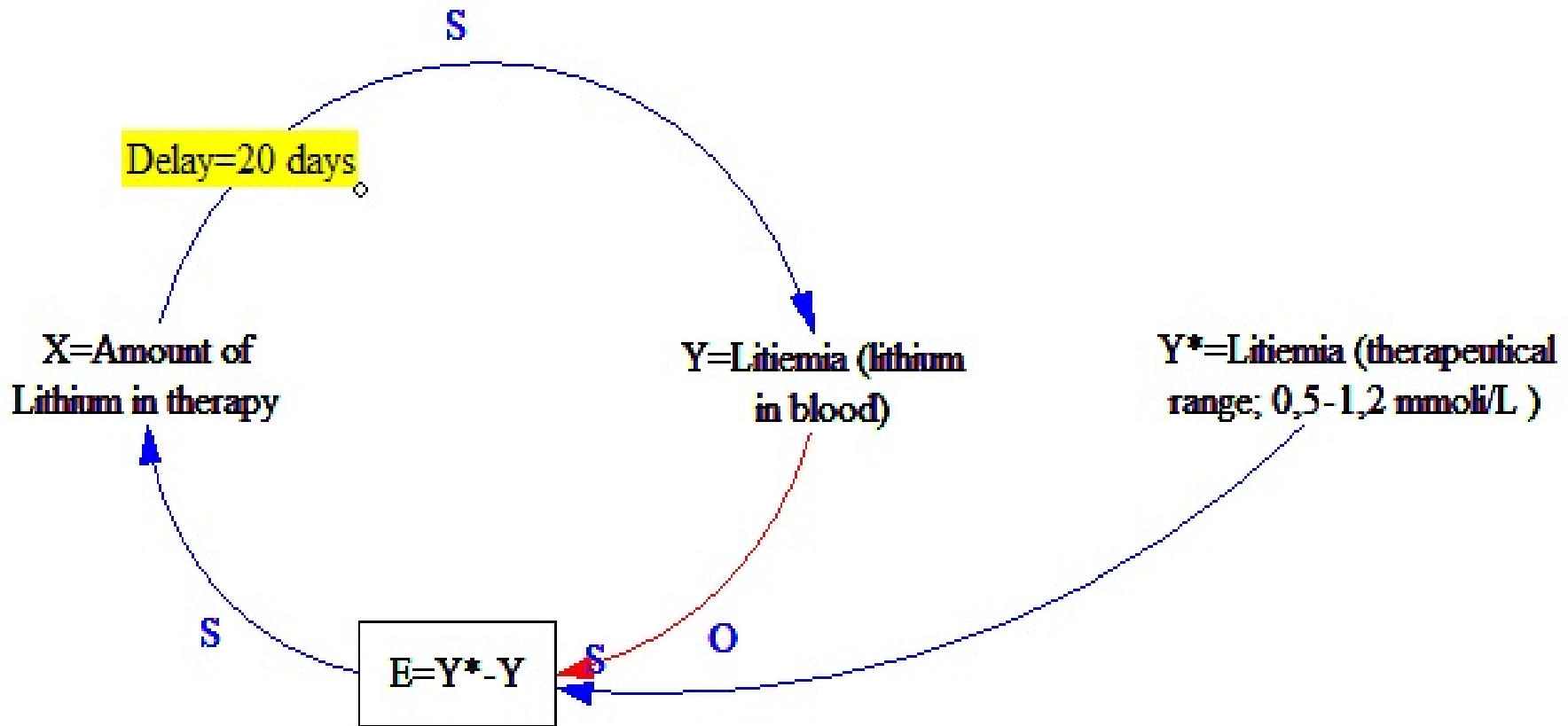
Yes, of course!





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ATTACHMENT n°2: How works the Bipolar Disorder



Litiemia is the amount of lithium we have in our blood. This value has to stay in a “therapeutical range” to be healing: under a certain value lithium is ineffective, over a certain value lithium is toxic.

Thanks for paying attention!

Never underrate **Anxiety Disorders**.
They could seem simple to heal but they are “tricky”
and could affect everybody very easily.

*“If you know the enemy
and know yourself, you
need not fear the result of
a hundred battles. If you
know yourself but not the
enemy, for every victory
gained you will also suffer
a defeat. If you know
neither the enemy nor
yourself, you will succumb
in every battle.”*

*-Sun Tzu, “The Art of
War”-*

**Keep your mind safe and clean
so you could live your life in a
condition of good *Mental
Serenity*, one of the most
important variable in your life.**

Thanks to **Prof. Piero Mella** for teaching me the logic of Systems
Thinking and much more.

Thanks to **Dr. Irene Lucia Vanelli**, Psychiatrist at San Raffaele
Hospital, Milan, and her équipe for teaching me a lot of things
about these diseases.