

***From genes to social context:
Understanding and treating stuttering***



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A multi-dimensional disorders need
holistic model of human system

Proposing such a model: BPS2.0

Incorporate generic model for
stuttering: NDC-4

Case Study (the last 30 mins)

Many different causes of handicap

- Genetic component
- Neuro-biological anatomical differences
- Brain chemicals
- Differences in brain functions
- Conditioning: association of fear and stuttering to situations and people
- Learned behaviours: secondary symptoms
- Mal-adaptive thoughts: "I shouldn't talk", "I can't do this because of stuttering",
- Acceptance of social environment
- Job Market: reaction to stuttering

Many different treatment options

- Protein replacement (in the future?)
- Pharmaceutical
- De-conditioning through exposure: learn to un-learn fear of speaking situations
- Re-shape secondary symptoms: keep eye contact, reduce fillers, avoid avoidance
- Fluency shaping, stuttering modification.
- Cognitive therapy: change your beliefs: "I have the right to talk", "Stuttering is not holding me back",
- Informing and shaping your social environment
- Job Market: change reaction to stuttering

For a clear picture, we need

1) a holistic framework to classify and manage human complexity.

and

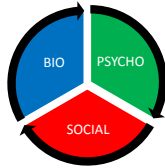
2) a generic theory of stuttering catering for

- sub-types of the biological basis for stuttering.
- all drivers of symptom and handicap.

Let us derive our basic model of the human system

The standard answer is “the biopsychosocial model”

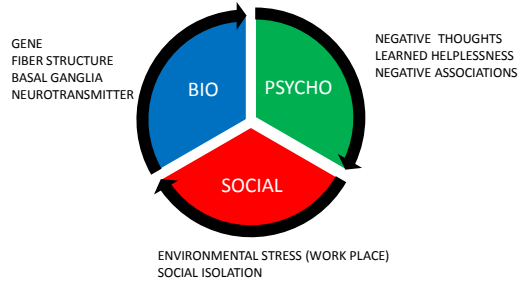
Engel (1977)



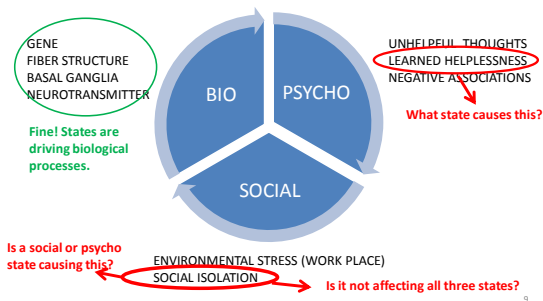
Disorders affect all three, which affect disorders.

Consider the three whenever you deal with humans.

A biopsychosocial view on stuttering



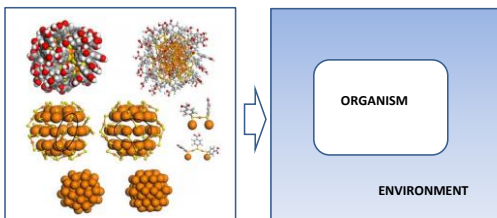
Superficial Approach: What states drive the processes?



From an upcoming book co-written with Dr Michaux, PhD psychology

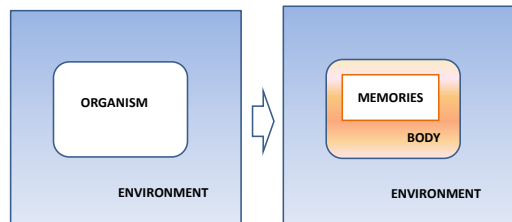
DERIVE AND USE A CONCRETE BIOPSYCHOSOCIAL FRAMEWORK

Step 1: Slice physical world



The world is filled with matter obeying physical laws. We slice and model the world into the external and internal of the organism. At each moment, both are in a certain physical state.

Step 2: Split body and stored information



Biological system that learns (adapts to environment) by storing info based on environmental interactions and internal processes. At each moment, memories and body are in a certain physical state.

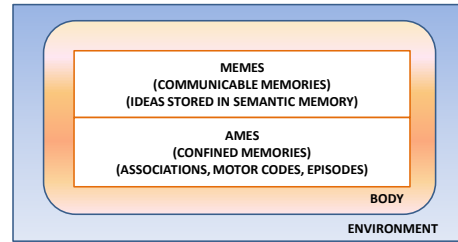
Where is social isolation?

“John has very little social interactions.”

- A process but not a physical element of environment.
- The process could be influenced by different states in
 - Environment (People with memories “Avoid John!”)
 - Body (autism)
 - Memories (“I don’t want to talk to people inferior to me”)

13

Step 3: Split memories into two



Two types of stored information based

1. communicable memories, via language and other means.
2. confined memories, learned individually.
(e.g. the concept of juggling versus the skill of juggling.)

14

Communicable memories (memes)

- Concepts: parent, sea, physics, TV, bridge, password.
- Knowledge/Belief: password is XYZ, my Name is Z, water freezes at 0° Celsius.
- Scripts: how to tie laces, how to greet, how to date. (note: not the motor code but verbal instructions)
- Labels: social labelling of sensori-motor memory, e.g. labeling the colour of red as “red”.

10'000s of memes (communicable memory) inside our head.

15

Confined memory (A.M.E.s)

Associations: a spider phobia, Pavlov effect.

Stimulus A ~ Stimulus B due to pairing (not to be confused with association between concepts)

Motor Code: walking and articulating vowels.

Episodes (or sensory memory): face of mother, taste of chocolate, smell of cheese, sound of bell.

16

Test: Ame or Meme or Both?

- “My grand-father is called Kelly”
- The face of my teacher
- “I was in Rome”
- The smell of cheese
- “When I see a spider, I have panic.”
- “I fear spiders.”
- Ten-finger typing

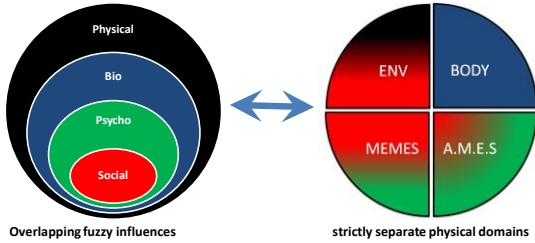
17

The human system divides into four domains again divided up in thousands of elements

Memories		Body	Environment
Meme 1	AME 1	Body 1	Env 1
Meme 2	AME 2	Body 2	Env 2
Meme 3	AME 3	Body 3	Env 3
Meme 4	AME 4	Body 4	Env 4
Meme 5	AME 5	Body 5	Env 5
Meme 6	AME 6	Body 6	Env 6
Meme 7	AME 7	Body 7	Env 7
Meme 8	AME 8	Body 8	Env 8
Meme 9	AME 9	Body 9	Env 9
Meme 10	AME 10	Body 10	Env 10
Meme 11	AME 11	Body 11	Env 11
Meme 12	AME 12	Body 12	Env 12
Meme 13	AME 13	Body 13	Env 13
Meme 14	AME 14	Body 14	Env 14
.....

18

Dual perspective: processes - states



Why does she eat ice cream?

EXAMPLE ON WHICH ELEMENTS IN THE FOUR DOMAINS DRIVE THIS

19

20

Elements driving "eating ice cream"

<u>Memories</u>	<u>Body</u>	<u>Environment</u>
"Eat icecream when sunny."	Body 1	Env 1
Meme 2	Body 2	Env 2
Meme 3	Body 3	ice cream
Meme 4	Body 4	Env 4
Meme 5	Taste of vanilla	Env 5
"Vanilla is my favourite."	blood sugar	Env 6
Meme 7	Body 6	Env 7
Meme 8	Body 7	sun
Meme 9	Licking	Env 9
"Icecream is cold."	"Empty" stomach	Env 10
.....	Body 10	Env 11
	Body 11	Env 12
	Body 12	Env 13
	Body 13	Env 14
	Body 14
	

21

GENERIC THEORY OF STUTTERING

NDC-4 is holistic framework for scientific theories on stuttering

Neurobiological Demand and Capacity model
(hide complexity of causal subtypes)

within

4-domain biopsychosocial framework
(acknowledging the re-enforcing adaptive learning)
(the topic of an up-coming book)

All share dysfunction in performance

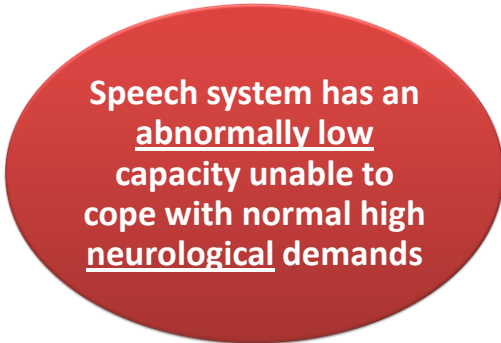
Stutterers might vary in causes and symptoms, but

"All have moments where they know exactly what they want to say but cannot actually say it."

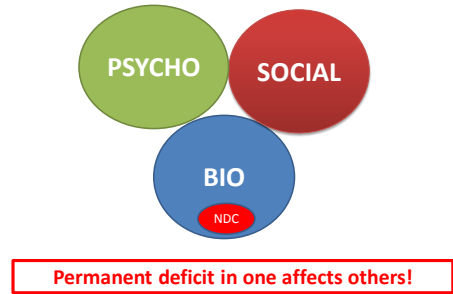
"Those moments are abnormally frequent and the duration of the jam is abnormally long."

"They have moments where they can say exactly what they want to say at the moment they want to say it."

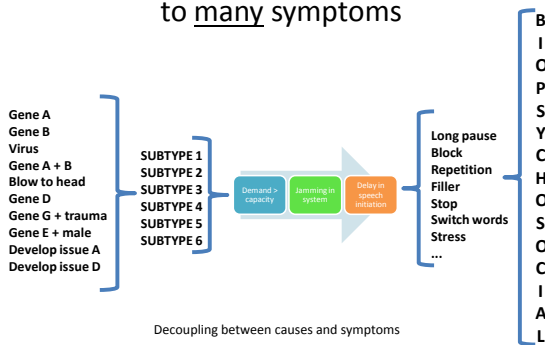
Think neurological demand and capacity



Permanent neurobiological deficit leads to biopsychosocial adaptation



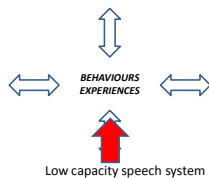
Many causes to one dysfunction to many symptoms



Example of developmental stuttering

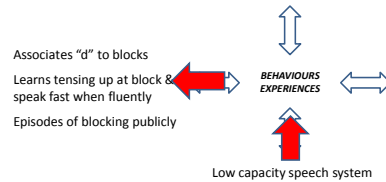
From a neurobiological deficit to full-blown stuttering symptoms

BODY: the low capacity leads to stuttering



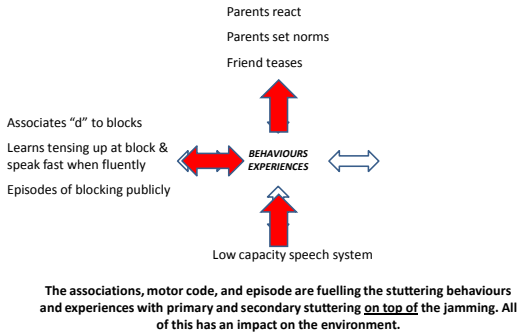
The low capacity system in the bio system jams at high demand and creates stuttering behaviour and experiences of stuttering.

AME are created as kid adapts

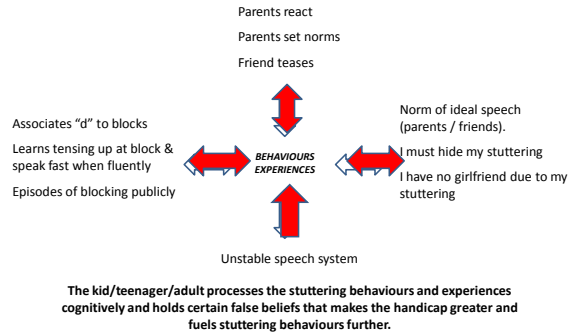


Stuttering behaviours and experiences from jamming in biological system creates associations, motor codes, and episodes. While low capacity system keeps on jamming!

ENVIRONMENT changes



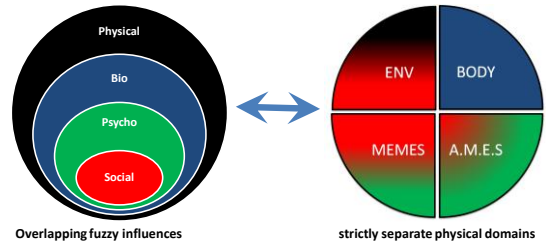
Beliefs are created as kid adapts



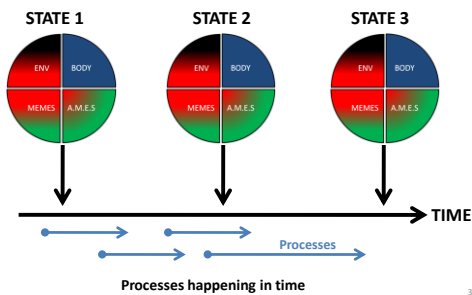
Dual perspective: processes - states

TREATMENT SCHEME

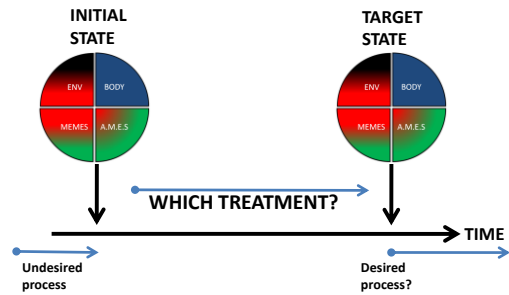
HOW TO UNDERSTAND AND TREAT DISORDERS HOLISTICALLY



Biological, psychological, and social processes describe changes of physical states



Treat=Change state to change B&E



BPS2.0		INTERVENTION MATRIX	
<i>Rank intervention methods according to impact and changeability in order to prioritise intervention</i>			
	<i>LOW</i>	CHANGEABILITY	
			<i>HIGH</i>
IMPACT	<i>HIGH</i>		gradual desensitization, flooding, role play, hypnotherapy, convince him to go to self-help group
		self-help group, anti-stress (stress relaxation, meditation, sports, medication)	beta-blockers
<i>LOW</i>			pharmaceuticals

43



CHECK WEBSITE!

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44