Frames in psychiatric classification

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Field(s) of psychiatry

Reference ontology, current discussion

using Frame Approach

„new bricks“ in ontological systems?
ICD-10 - Classification of Diagnoses:

Diagnosis: “Condition state at the present time“
Discussion about psychiatric classification

Kristian E. Markon, PhD (University of Iowa, USA)

- is there a need for a nosology at all?

- nosological systems would impede scientific development

➡ Psychiatric disorders represent practical kinds of constructs.

Constructs or measures reflected in any given nosology constrain the theories that they can be applied to.

➡ Nosological systems ... being developed to serve as heuristic. If they have just an heuristic value, why publish them at all...
Classification systems

Q8 - ‘In your day-to-day clinical work, which classification system for mental disorders do you use most?’

Reed et al, *World Psychiatry*, 2011

with kindly permission from J.Reed, WHO
ICD-10: The F-Group

Mental and behavioural diseases

Organic and another diseases

Difference?

no valid biomarkers for mental disorders
ICD-10: The F-Group

Psychiatry

Psycho-oncology

Psychosomatics

Neurology

Clinical psychology
Case Study 1

- 51 year old woman, lives with her partner, no children; part-time job at police administration.

- several months on sick leave: condition of inner emptiness, severely impaired on her capacity to work

- triggered through a temporally high pressure situation (high work load) at the office

- “coping” by drinking too much alcohol daily, isolating herself from her mates

- searched for professional assistance to prevent getting addicted

- constant feeling of inner strain since she is able to think

- core feeling of permanent insecurity, as if something could go wrong

- low self-esteem
Case Study 2

- 49 year old woman, divorced, living alone, no children, tutor on training college
- has severe signs of fatigue, increased need for sleep
- feels mentally unfit to do her teaching
- according to her physician no physical causes
- some years ago she suffered stroke with a corollary loss of normal language capability
- after stationary rehabilitation capable of good language again
- before stroke she was in a position of a senior controller in a big company
- after rehabilitation she felt no more capable to stay well focused on her functions
  ➔ decision to give up her job
Classification in case studies
- comorbidity

Case 1: **Severe Depressive Episode (F32.2)** against the background of narcistic personality disorder (F60.8)

⇒ Primary mental disease(s)

Case 2: **Severe Depressive Episode (F32.2)** against the background of stroke (I63.9)

⇒ Primary somatic disease leads to (secondary) mental disease
Looking behind diagnosis: Neurobiology of depression

Serotonin hypothesis

PRESYNAPTIC CELL

AUTORECEPTOR

REUPTAKE TRANSPORTER

SYNAPTIC CLEFT

POSTSYNAPTIC CELL

SEROTONIN RECEPTOR

SEROTONIN

Image by Bilt0r, © 2005 Erowid.org
Looking behind diagnosis:
Neurobiology of Auditory hallucinations

Auditory hallucinations in schizophrenia
Grey matter density reductions:
- bilateral insula
- bilateral superior temporal gyri
- left amygdala

G. García-Martí et al. (2008)
Idea of modularity
Linking neurobiology with symptoms

Neurobiological evidence for mental diseases

visual processing

... 

affective processing

Modules

Range of symptoms / mental activities
What are modules?

discernable functional units that organize human mind

synonyme:

faculties of mind

attractive for psychiatric classification

Gaebel at al. 2006
Modularity

debate around the idea of modularity since publication of „Modularity of Mind“ (1983), J. Fodor
Properties of modules

(1) Localized: modules are realized in dedicated neural architecture
(2) Subject to characteristic breakdowns: modules can be selectively impaired
(3) Mandatory: modules operate in an automatic way
(4) Fast: modules generate outputs quickly
(5) Shallow: modules have relatively simple outputs (e.g., not judgments)
(6) Ontogenetically determined: modules develop in a characteristic pace and sequence
(7) Domain specific: modules cope with a restricted class of inputs
(8) Inaccessible: higher levels of processing have limited access to the representations within a module
(9) Informationally encapsulated: modules cannot be guided by information at higher levels of processing

J. Prinz (2006)
Criticism of the modularity of mind

Jesse Prinz: “Systems that have been alleged to be modular cannot be characterized by the properties on Fodors‘ list “

“shallow output“ – outputs requiring only few of processing but:

visual system – from retinal stimulation to visual recognition complex process
Criticism of the modularity of mind

- intense debate in the cognitive sciences for more than two decades

- despite criticism modularity supported by arguments convincing many
Neurobiological foundation of modules

spatially stable subunits vs. network theories

He et al., 2009
Modules and disorders

identification of modules (functional entities) and their disturbances

→ definition of relevant core modules for given disorder

Disturbed Mental Functions (Modules) in Schizophrenia

Kircher, 2008
Disturbances on modular level

How disturbances may occur on a modular level?

General principles of impaired modular functions:

- Slowing of impulse transfer
- Reduction of response amplitude
- Episodic interruptions
- Delayed "switching" between modules
- Reduced access to contextual information ("hyper-modularity")

(Zielasek & Gaebel, 2008)
Connection between symptoms and modules?

- beliefs as normally non-modular processes
  - become modular in schizophrenic delusions (David, 2003)

→ reduced access to information from other cognitive domains
  - that may correct false beliefs („hyper-modularity“)

(Zielasek & Gaebel, 2008)
John Nash suffered delusions over long time…

could get insight …
Modules or Faculties of Mind & Frame Analysis

disturbed faculties as attributes of a person

non-adequate

Perception

Person

Motor Faculty

Fine Tuned
Example of executive faculty

Executive function (behavioral outcomes) allows us
- make plans
- keep track of time
- change our minds
- choose appropriate actions etc.

Based on interaction of three parts:
- subdue irrelevant impulses (Inhibition)
- process information (Working memory)
- switch to new situation (Cognitive flexibility)
Frame of undisturbed executive faculty
- work in progress -

- Rehearsal
  - Phonological loop

- Executive Faculty
  - Switching
    - Cognitive flexibility
      - timed
      - adequate
  - Regulation
    - Inhibition
      - adequate

- Task:
  - Impulses
    - attend to
  - internal / external
    - type

- Working memory
  - central executive subsystem
    - adequate
  - visual/spatial subsystem
    - adequate

- Control
- Imagery

Frames in psychiatric classification August 25, 2014
Frame of specific phobia

Classificatory Definition of Specific Phobia (F40.2) ICD-10 ➔ basis for frame

A. Either (1) or (2):

(1) marked fear of a specific object or situation not included in agoraphobia or social phobia
(2) marked avoidance of such objects or situations

Among the most common objects or situations are animals, birds, insects, heights…

B. Symptoms of anxiety in the feared situation at some time since the onset of the disorder

C. Significant emotional distress due to the symptoms or the avoidance, and a recognition that these are excessive or unreasonable

D. Symptoms are restricted to the feared situation, or when thinking about it
Frame of specific phobia (F 40.2)

**specific phobia**

- Fear of object/situation
- Presence
- Danger
- Intensity
- Anxiety
- Reactions
  - Physiological
  - Emotional
  - Behavioral
- Flight/avoidance
- Fear/disgust

**Comparison**
- Subjective > objective

**Presence**
- Actual: e.g. yes
- Imaginative: e.g. no

**Reactions**
- Altered physiological processes

**Intensity**
- High
- E.g. appropriate

**Comparison**
- Subjective > objective
Modular „bricks“ as a part of psychiatric taxonomy?

Modules must be identified and related to clinical symptoms

A range of perceptive, intentional, social, motor, affective/emotional modules may be expected

➤ Hierarchy of module dysfunctions in mental disorders according to the affected functional modules.
Frame of specific phobia (F 40.2)

Potential disturbed core faculties in Phobic Disorder:

Executive and Motor Control

Agitation

Motor Faculty

executive faculty

specific phobia

exececutive faculty

attend to impulses

FOR

Inhibition

Regulation

external
Perspective

Interlinking

Ontology of Mental Diseases

- F0 Organic including symptomatic disorders
- F1 Substance related disorders
- ...

Ontology of faculties of mind

- Perception
- Motor
- Executive Function
- ...

frame analysis for connecting both

➔ from research on different diseases to research exploring basic functions or underlying mechanisms
Thank you!