Cognition and Psychopathology

PSY342F

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Introduction
What is Psychopathology?

Societies have members that differ from majority

Two (non-exclusive) categories:

• the disturbing
• the disturbed

Former troubling, but appear to understand their actions and choose them.
Latter unable to choose to behave/believe differently.

“Abnormal”

What counts as “abnormal” or “pathological”?

• Different from average / “norm”?
• Genuine illnesses?
  - Biochemical/medical
  - Psychological?

Not easily answered.

*Phenomena considered “abnormal” may not be homogenous.*
Generally, psychopathologies share three features:

- the individual acts and/or believes markedly differently from most other people
- such actions/beliefs are not under the control of the individual
- these actions/beliefs impair the individual's ability to function (whether they recognize this or not)

E.g., proposed DSM-5 definition:

a) A behavioral or psychological syndrome or pattern that occurs in an individual

b) That reflects an underlying psychobiological dysfunction

c) The consequences of which are clinically significant distress (e.g., a painful symptom) or disability (i.e., impairment in one or more important areas of functioning)

d) Must not be merely an expectable response to common stressors and losses (for example, the loss of a loved one) or a culturally sanctioned response to a particular event (for example, trance states in religious rituals)

e) That is not primarily a result of social deviance or conflicts with society
Is it “pathology”? 

- Some have claimed that mental illness as a category does not really exist
- Label for deviant behaviour that does not fall into other categories (e.g., criminal)
- “Anti-psychiatry”

Useful critiques, but:

- Over-romanticize disorders, downplay suffering
- Applied primarily to psychotic disorders, not to more mundane pathologies (e.g., depression) that do not involve such societal displeasure
- Ignore biological and psychological evidence of real differences between individuals with psychopathologies and those without
Although formal anti-psychiatry movement has waned, arguments still have some influence:

- *Psychiatric survivor* movement
- *Neurodiversity approach* to autism spectrum conditions

There are also potential darker aspects to this approach:

- “*Pro-ana*” culture among eating disorder sufferers
- The attempted normalization of pedophilia (e.g., NAMBLA)

Also, concerns regarding “pathologizing” normal behaviour (e.g., “pre-menstrual syndrome”, homosexuality, “hysteria”, “gender identity disorder”).

Having formal diagnostic labels can have very powerful practical impacts:

- Existence/type of diagnosis can determine whether private health insurance pays for treatment
- Some government/non-profit programs limited to certain diagnoses
  - can result in “diagnostic substitution” (e.g., autism)
What does cognition have to do with psychopathology?

- Key features of psychopathology: aberrant behaviours and beliefs.
- Individuals with same environment and stimuli act radically different (often to own detriment) without volition.
- Cognition: how ("normal") individuals process information and make decisions
- Psychopathology defining features include faulty processing of information and irrational decision-making.

Benefits of Cognitive Approach

- Practical benefits
  - Improved diagnosis and treatment (e.g., Cognitive Behaviour Therapy for depression)
- Theoretical advances
  - Improved nosology (cf. syndrome-based approach of DSM-IV)
  - Clearer understanding of brain-cognition link
  - Illuminate normal cognitive processes
Isn’t it all biochemicals/neurological?

Why study cognition? Why not go straight to the brain?

- Many psychopathologies have clear environmental antecedents (e.g., PTSD)
- Many psychopathologies very amenable to psychological interventions (e.g., CBT for mood disorders).
- Cognitive approach may illuminate specifics of brain dysfunction (e.g., inhibitory dysfunction in depression).

Mental Disorder as Illness

Our modern conception of mental disorder is as an illness:

- the etiology (cause/origin) of the disorder is a pathology or disease [i.e., systemic dysfunction(s)]
- pathology causes overt clusters of symptoms
- symptoms are alleviated primarily through the removal of the underlying pathology
- in principle similar to physical diseases in theoretical account

(Contrast with historical perspectives, e.g., supernatural forces or moral failure)
Versions of Pathological Model

Specific versions of pathological model have additional assumptions, primarily involving etiology:

**Medical Model**

- underlying pathology is organic (somatogenic)
  - mental illness is genuine physical disease, albeit with marked psychological symptoms
- treatment involves physical intervention (e.g., pharmacological agents)
- treatment provided by members of the medical profession

**Psychological Model**

- underlying pathology is psychological
- treatment involves addressing the psychological cause through "talk" therapies and/or behavioural interventions
- treatment provided by those trained in clinical psychological techniques
Which model is correct?

The question itself presumes that all psychopathologies are qualitatively similar in origin, which is certainly not the case:

- some disorders have clear psychological antecedents (e.g., phobias)
- other disorders show evidence of physical genesis (e.g., schizophrenia)

Current thinking takes a broader, eclectic view of psychopathology ("biopsychosocial" approach), although debates about the nature of the causal factors of many disorders (e.g., depression, anorexia) still rage.

Can also distinguish between vulnerability and promixal causes (diathesis-stress models)

Classification of Mental Illness

*Nosology*: the classification of illness

Classification of disorders is not exact, and all disorders not classified by same principles.

Medical diagnoses can be made using a number of different criteria:

- symptom presentation (e.g., migraine)
- structural pathology (e.g., broken bone)
- deviation from physiological norm (e.g., hypertension)
- etiology (e.g., influenza)
Although etiology is important to theoretical understanding of psychopathology, the classification of diagnostic categories of mental illness are (in current practice) primarily atheoretical in orientation.

Most classification systems of psychopathology are based on examination of overt symptoms. The primary classification concept is that of syndrome:

*syndrome* - a pattern of symptoms which tend to go together

(Syndrome is atheoretical notion that essentially looks at correlation of symptoms.)

Emil Kraepelin first systematized mental disorders in terms of syndromes in 1896. His system proved very influential on later classification attempts.

Current diagnostic approach in North America is governed by the fourth revision of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) published by the American Psychiatric Association (1994).

(Other similar systems exist, such as the World Health Organization's more general *International Statistical Classification of Diseases and Related Health Problems*, or ICD.)
DSM-IV takes a \textit{categorical} approach to diagnosis:

- mental disorders divided into types based on criteria sets with defining features

(Contrast with a \textit{dimensional} system, where classification is based on \textit{quantification} of attributes along pre-determined dimensions that capture relevant distinctions.)
Note that DSM-IV does not assume that:

- each category of mental disorder is a completely discrete entity with absolute boundaries dividing it from other disorders or no disorder
- all individuals diagnosed with the same disorder are alike in all important ways

Diagnostic criteria in DSM-IV are often polythetic:

- determined by multiple criteria, requiring only a subset of criteria from a longer list in order to meet diagnosis

(e.g., a diagnosis of Borderline Personality Disorder requires only five out of nine possible criteria).

The disorders noted in the DSM-IV fall into broad categories, e.g.:

- *Schizophrenia* and other *psychotic disorders*
- *Mood disorders* (e.g., major depression, bipolar disorder ["manic-depression"])
- *Anxiety disorders* (e.g., agoraphobia, panic disorder, specific phobia, obsessive-compulsive disorder, posttraumatic stress disorder)
- *Eating disorders* (e.g., anorexia, bulimia)
- *Personality disorders* (e.g., antisocial personality disorder, borderline personality disorder)
DMS currently undergoing revision (DMS-5) for release in 2013.

Major changes may include:

- addition of *dimensional* components, measuring symptom severity, personality, etc.

- addition of cross-cutting assessment, features that are not specific to particular disorders but are commonly present across many disorders (e.g., mood, sleep)

- major revision of some diagnostic categories (e.g., collapse of various disorders into Autism Spectrum Disorder)

- reworking of Substance Use and Abuse into more general Addiction category, which will now include a solely behavioural disorder (Gambling)
Although clinical judgement is usually used to develop a diagnosis, there are more objective methods available that are often used in research settings.

E.g., the Structured Clinical Interview for the DSM-IV (SCID)

- a interview procedure with specific, verbatim questions that an interviewer is to ask
- questions designed to establish if interviewee meets DSM criteria for various disorders

Research also uses a variety of disorder-specific tools to assess overall severity, but these are not used diagnostically.

Cognitive Approach to Understanding Psychopathology

Cognition: the manner in which individuals process information.

Cognition involves a number of narrower areas, including:

- **Perception**: how information is detected and initially processed
- **Attention**: how information is selected for processing
- **Memory**: how information is preserved for later use
- **Judgement**: how information is acted upon

Any/all can be affected by psychopathology.
Four categories of cognitive concepts (Kendall and Dobson, 1993):

- structures
- processes
- content
- products

Cognitive structures: the organization of past experience in memory that guides the interpretation of new experiences

- e.g., schema:
  - a cognitive structure, formed through prior experience, that filters present incoming information and provide an interpretation of it

The notion of schema is central to certain cognitive accounts of depression.
Cognitive processes: the manipulation of information, the operations involved in perceiving, remembering, and interpreting experiences.

Perceptual distortions are involved in many psychopathologies, and some also affect memorial processes and produce attentional biases (e.g., anxiety disorders). Some disorders may show effects on relatively "low level" processes (such as inhibitory processes, e.g., psychopathy).

"Cognitive processes" is a broad area.

Cognitive content: what is actually represented in cognitive structures, the specific information that is present (the content of memory).

Some disorders (especially mood and anxiety disorders) produce marked effects on the content of memory.

Cognitive products: the result of interactions of the other three aspects, and produce attributions / judgements / interpretations.

Distortions in attributions or interpretations are a common feature of many disorders.
We can also distinguish between cognitive *deficits* and cognitive *distortions*:

- **cognitive deficit**: a lack of or reduction in a cognitive process (e.g., inhibitory processes)
- **cognitive distortion**: active but dysfunctional thinking process (e.g., misinterpretation of events)

Further helpful (interrelated) distinctions in cognitive processes:

*Early* vs. *late* processes: time-course of the processing of stimuli.

- **Early processes** happen soon after a stimulus is encountered
  - generally automatic and primarily perceptual (e.g., detection of a noise)
- **Late processes** happen more downstream
  - usually involve more meaning-based, higher-level processing, often under volitional control (e.g., reasoning)
Perceptual vs. conceptual processes: the type of information that is being manipulated for a given stimulus.

- *Perceptual* processes focus on the form of the stimulus, and involve the actual physical representation (e.g., determining in what colour of ink a word is displayed)
- *Conceptual* processes involve the semantics (meaning) of the stimulus (e.g., coming up with a synonym for a word)

Automatic vs. controlled processes: the degree of attention and conscious control that a cognitive operation requires.

- *Automatic* processes occur with requiring attention, and may not be amenable to conscious control (e.g., converting letter strings to words, i.e., reading)
- *Controlled* (or *effortful*) processes only happen when an individual is consciously attending to them (e.g., doing arithmetic)
Explicit vs. implicit memory: two different manners in which past experience can influence current cognitive processes.

- **Explicit** memory involves conscious recollection of past events/stimuli (e.g., recognition, recall, what we usually think of as “memory”)

- **Implicit** memory involves a past event or stimulus affecting present processing without a conscious experience of recollection (e.g., priming)

Methodologies for Examining Cognition in Psychopathology

There are a huge number of experimental tasks and paradigms that are used to examine cognitive factors in mental disorders.

They can be grouped in part on the basis of what aspect of cognition they address.
Measures of Attentional Bias

Attention is a limited capacity resource

• only so much attention that can be allocated to those cognitive processes that require it.

Incoming information must be filtered or selected in some manner, so that only some is processed further.

Attention may be influenced by emotion:

• may influence the kind of information that is selected for

• emotional disorders may impose attentional biases on detection and processing of stimuli relevant to the person's affective condition

For example:

• individuals with spider phobia may be hypervigilant to possible spider threats.

• depressed individuals may have attentional bias towards negative evaluation.
Biases may reveal themselves in terms of:

- **task facilitation**
  
  (when the object of the task is to detect *disorder-congruent* material)

- **task interference**
  
  (when the disorder congruent material is *irrelevant* to the primary task)

One task used to explore such biases is the *dichotic listening task*:

- participant listens to two different messages, one in each ear

  - blah, blah, blah
  - yadda, yadda, yadda
• participant must repeat ("shadow") the message in one ear, and ignore message in the other

- typically, participants must also perform some secondary task
  - indicate when certain target words occur in either ear
• typically, participants must also perform some secondary task

- indicate when certain target words occur in either ear

- detect a visual stimulus
- detect a visual stimulus

If disorder produced attentional bias for some kinds of material, then...
Where task involves detection of disorder-related material, attentional bias will *facilitate* task performance.

Where disorder-related material is irrelevant to the task, attentional bias will *interfere* with task performance.
Burgess, Jones, Robertson, Ratcliffe, & Emerson (1981) examined the relative detection sensitivity of social phobics and non-phobic controls for target items that were either neutral ("pick") or fear-relevant ("failure").

- both groups detected both target types in attended ear equally well
- social phobics detected fear-relevant words in unattended channel better than controls

Example of facilitation.

Example of interference: Stroop task
Word *meaning* interferes with processing of colour stimulus.

In anxiety disorders, patients show more colour naming interference for threat related words than do control subjects (e.g., Mathews & MacLeod, 1985).

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Such results suggest that anxious patients may be hypervigilant for threat information.

Similar effects have occasionally been found in depression for negatively evaluative words

- e.g., "stupid", "lonely", "failure"

but these effects are generally much harder to produce

- depression may involve less perceptual hypervigilance than anxiety
Memory Bias

Schemata for particular information should facilitate processing of that type of information, and should make recall easier.

To what extent do individuals with affect disorders recall disorder-relevant information?

Numerous studies:

- depressed and non-depressed individuals
- present negative and positive descriptive terms to remember
  - e.g., "stupid", "lonely", "failure"; "intelligent", "charming", "beloved"

Generally,

- depressed individuals have better recall for negative material relative to controls, with little difference for positive material.

Similar studies in anxious individuals have provided mixed results (some studies show biased recollection of threat words, some studies don't).
Judgements

Deliberative judgements about stimuli have been used to examine expectancies or attributional biases in disorders.

(Such judgements are "high-level" cognitive products, the result of elaborative processes.)

Alloy & Abramson (1988) looked at expectancies of success that depressed and non-depressed individuals had for a series of trials on two different types of tasks, one determined purely by chance, the other ostensibly skill-related (but not really). Both task actually had a 50-50 chance of success on any trial.

- *non-depressed* subjects would *over-estimate* their likelihood of future success on the "skill" trial – accurate in their estimate of success for someone else.

- *depressed* individuals were relatively *accurate* in their assessment of future success, although sometimes over-estimated the success of others.

(Alloy and Abramson have argued that this shows "depressive realism")
Derry & Kuiper (1981) showed positive and negative descriptive adjectives to depressed and control subjects, and asked them to decide if each adjective described them or not.

Depressed subjects showed faster judgement reaction times for negative material than for positive.