Ch. 13: Clinical & Counseling

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- Settings / Situations
- Test Types
- Test Design
  - Deductive
  - Empirical
- Frequently used tests
  - MMPI
  - 16PF
  - NEO-FFI

Clinical and Counseling Settings

- Hospital
  - Inpatient
    - acute
    - long-term
  - Outpatient
- School
  - Counseling (educational)
  - Counseling (psychological)
- Vocational
- Motivational/Performance

Types of Tests

- IQ & Achievement
- Personality
  - structured ("objective")
  - unstructured ("projective")
- Clinical
  - Diagnostic
    - Depression, Anxiety, etc.
  - Symptom checklists
- Neuropsychological

Logical Reasoning

- Deduction
  - premises —> conclusion
    - All swans are white
    - Susan is a swan
    - Therefore, Susan is white
- (Empirical) Induction
  - less certain: evidence —> probability
  - All of the swans we have seen are white
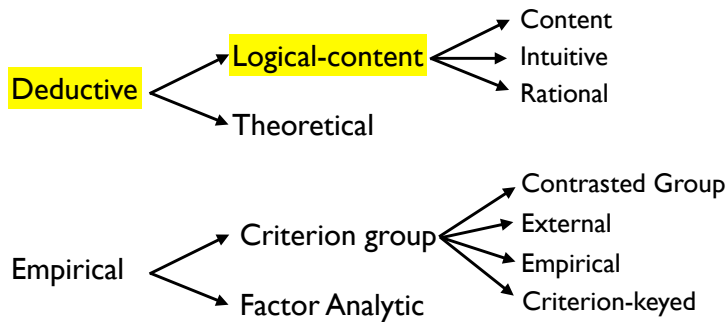 - Thus, all swans are probably white

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Design Theories

- Deductive (aka "Top Down" or "Theory-driven")
  - Use reason, clinical experience and common sense to choose test items that are face-valid.

- Empirical (aka "Bottom-Up" or "Data-driven")
  - Look for patterns in large groups of data
  - Data tells us what factors exist
  - Don't assume face validity

Design Theories

Deductive → Logical-content → Content / Intuitive / Rational

Deductive → Theoretical

Empirical → Criterion group → Contrasted Group / External / Empirical / Criterion-keyed

Empirical → Factor Analytic

Logical-Content

- Deductive
  - Logical-Content
    - aka "Content approach", "Intuitive approach", "Rational approach"
    - straightforward questions
      - e.g. "did you wet the bed last night?"
    - assumes subjects are honest
    - Pro: simple
    - Con: simplistic, naive

Logical-Content: Woodsworth

- Woodsworth Personal Data Sheet (1920)
  - Developed in WWI to identify soldiers who would fail in combat
  - 116 Yes/No questions -- all face valid.
    - "Do you drink a fifth of whiskey a day"?
    - "Do you frequently daydream?"
    - ...

  - rarely used today

Logical-Content: Mooney

- Mooney Problem Checklist (1950)
  - yes/no to many problem items "I'm having trouble with money"
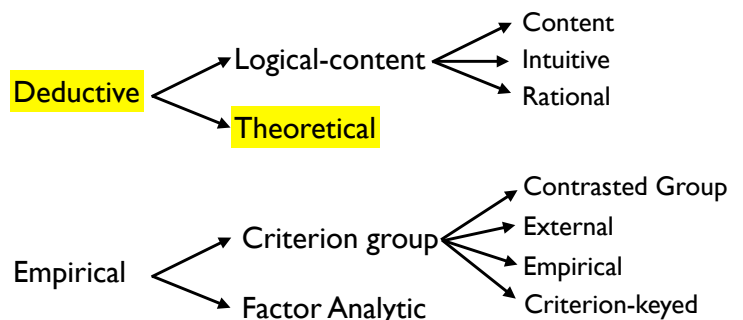 - sometimes used today. Why?

Criticism : Logical-Content

- Major assumptions:
  - Subjects are being honest
  - Items have one objective interpretation
    - e.g. "I never drink too much alcohol"
- Assumptions are flawed
- This design rarely used post 1940

Design Theories

Deductive → Logical-content → Content / Intuitive / Rational

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Theoretical

- Deductive
  - Theoretical
    - Theory of constructs (dimensions, factors) used to create test questions.
    - Example (from Freud)
      - Depression =
        - **Anaclitic** (anger at parents)
          - "do you get along with Mom & Dad?"
        - **Introjective** (self loathing)
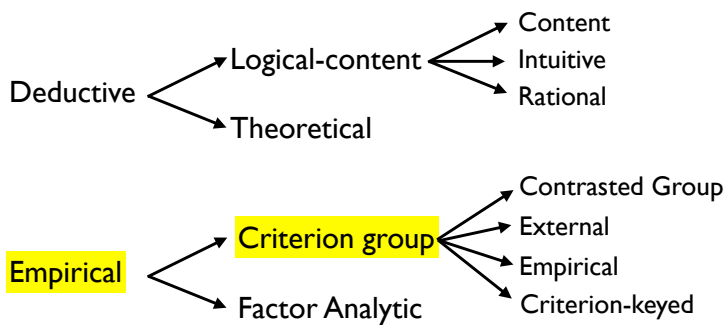   - "do you fall short of your goals?"

Criticisms of Theoretical Approach

- What evidence that the theory / construct / sub-constructs exist?
- Example:
  - Depression - what theory to use?
    - Psychodynamic?
    - Cognitive?
    - Behavioral?
    - Medical?
    - Social
    - ...

Design Theories

Criterion-Group

- Empirical
  - Criterion Group
    - aka "Contrasted Group", "External strategy"...
    - Give test items to a group that has some disease, disorder or diagnosis (e.g. "Schizophrenics")
    - Compare (contrast) with performance in an "normal" group
    - Items which strongly distinguish the groups are kept.
    - Cross-validate results with other group(s)

Criterion-Group Example

Question	Bullies	Non-Bullies
1. Do you like to hurt others?	N	N
2. Do you like watching Boxing?	Y	Y
3. Do you like Hello Kitty?	**N**	**Y**
4. I am always a good person	Y	Y

Cross-Validation

- Method of giving a more fair, accurate estimate of reliability by essentially "repeating the study" with new subjects
- Use the prediction equations (formulas) on a "fresh" sample
- Guards against "over fitting" data in the first experiment (e.g. Shrinkage)
- If cross-validation groups differ in demographics, increases generalizability.

Cross-Validation Example

- Researcher #1 does a study in their hospital showing that Schizophrenic patients say "Yes" to the question "I'm afraid of the color blue" at a much higher rate than control subjects.
- This test item can diagnose Schizophrenia?
- Researcher #2 attempts to cross-validate this study at a different hospital with a different set of patients and controls, and does not find the same effect.
- Why?

Criterion-Group Tests

- Minnesota Multiphasic Personality Inventory
  - Most popular / well researched test
  - Revisions
    - MMPI-2 : 1989; revised norms in 2003; 567 items
    - MMPI-2-RF : 2008 ; shortened to 338 items
  - 10 clinical scales
  - Focused more on psychopathology
  - Good psychometrics
- California Psychological Inventory - 3 (CPI-3)
  - 20 scales
  - focused more on health than illness
  - psychometrics are fair, not great

MMPI Design

- Goal : detect abnormal psychology
- Subjects: Eight criterion groups (psychiatric inpatients) plus normal* control group
- Method: Items which contrasted criterion group with normal group, AND which passed cross-validation at P<.05 level were kept.
- Test items were grouped into scales, the scales were named after the criterion group

- Later: additional scales added: Mf and Si

MMPI-2

- 567 true/false items
- About 2 hours to administer
- Item content appear as face valid statements "I like mechanics magazines"
- Item scoring is not done in face-valid way.
- Each item contributes to one or more <u>Clinical Scales</u> or <u>Content Scales</u>
- Additional <u>Validity Scales</u> attempt to correct for response styles, faking bad or good, etc.
- Scales are normed to T-Scores (mean 50, sd 10)

MMPI Clinical Scales

#	Scale	Name	Interpretation
1	Hs	Hypochondriasis	physical complaints
2	D	Depression	depression
3	Hy	Hysteria	immaturity
4	Pd	Psychopathic Deviate	authority conflict
5	Mf	Masculinity-Femininity	stereotypic m/f interests
6	Pa	Paranoia	suspicion, hostility
7	Pt	Psychasthenia	anxiety
8	Sc	Schizophrenia	alienation, withdrawal
9	Hy	Hypomania	elevated mood & energy
0	Si	Social Introversion	introversion, shyness

MMPI Validity Scales

#	Scale	Name	Interpretation
1	L	Lie scale	naive attempt to fake good
2	F	F scale	"Frequency" scale: attempt to fake bad
3	K	K scale	(sophisticated) defensiveness
4	VRIN	Variable response inconsistency	random responding
5	TRIN	True response inconsistency	"yes" bias

MMPI Psychometrics

- Overall reliability is good. Not as high as the best IQ tests.
- Median test-retest coefficients range from 0.50 to 0.90, average 0.80s
- Scales are poorly designed -- many items contribute score to more than one scale. Thus the scales are highly intercorrelated.
- Keyed poorly (e.g. all items on the L scale are keyed false) so sensitive to response style
- Scores are affected by demographics (age, gender, IQ, and to a lesser extent, ethnicity)

MMPI Validity

- Thousands of studies have been done on the MMPI supporting its Construct validity
- Used and researched in a very wide range of subjects, settings, disorders.

Criticism : Criterion-Group

- Major assumptions:
  - People/Patients can be grouped, groups show consistent features and are independent
  - Face validity of response is not important, but responses should be consistent
  - Scales can predict membership in criterion group
- Flaws:
  - Criterion group assumes a lot about patterns of behavior. Neglects possible commonalities across groups.

Project Example: Measuring Depression

- Theory
- Measurement
- Reliability / Validity

Design Theories

Deductive
- Logical-content
  - Content
  - Intuitive
  - Rational
- Theoretical

Empirical
- Criterion group
  - Contrasted Group
  - External
  - Empirical
  - Criterion-keyed
- Factor Analytic
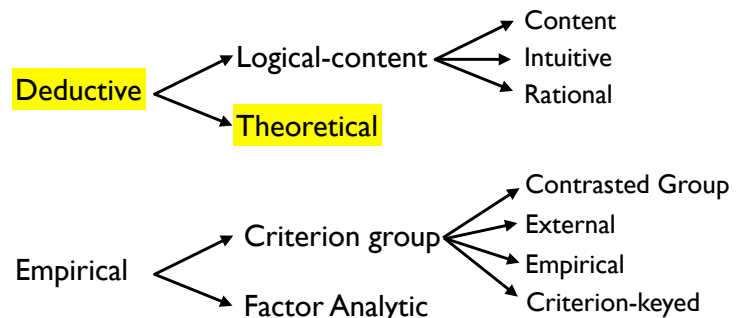
Project Proposal

- Pick a field and sub-field
  - get 1 *Review* journal article
- Pick a construct to measure
  - get 1 *Original Research* article
- Design two 1-item tests to measure your construct
- Write Proposal: 3 pages, 2 tests, 2 articles
- Due Date: see website
- Note: late submissions may not be included in survey

Theory & Construct, Measures

- Theories:
  - Psychodynamic
  - Modern CBT
- Measures
  - BDI-II
  - HAM-D

Depression : the Construct

- Examples of different theories and ways to define the construct of 'depression'

Psychodynamic Theory of Depression

- depression = inverted hostility
- Angry at parents, but parents needed for survival
- "anger turned inward"
- "self hatred"

Psychodynamic Theory of Depression

- Subtypes
  - *Anaclitic* depression : (perceived) loss of relationships one depends on
    - helpless, fears of abandonment, separation anxiety
  - *Introjective* depression : failure to meet own standards (harsh superego)
    - worthlessness, guilt, feelings of failure

Depression-modern theory

- Psychological (Emotional, Cognitive)
- Biological

Depression-modern theory

- Psychological
  - depressed mood
  - anhedonia
  - poor concentration
  - ruminations (guilt, worthlessness)
  - suicidal ideation
- Cognitive Triad - negative thoughts:
  - about the world
  - about the future
  - about the self

Depression-modern theory

- Biological:
  - weight change: unintentional loss or gain
  - sleep disturbances
 - psychomotor agitation or retardation
  - loss of energy

DSM-5 : Major Depressive Episode

- 5 or more for 2 week period, must include (*)
  - *Depressed mood most of most days
  - *Anhedonia
  - Significant weight gain or loss (5%/month)
  - Insomnia/hypersomnia
  - Psychomotor retardation/agitation
  - Fatigue/loss of energy
  - Worthless/guilty feelings
  - Trouble concentrating or indecisiveness
  - Suicidal ideation, plans, attempts

Design Theories
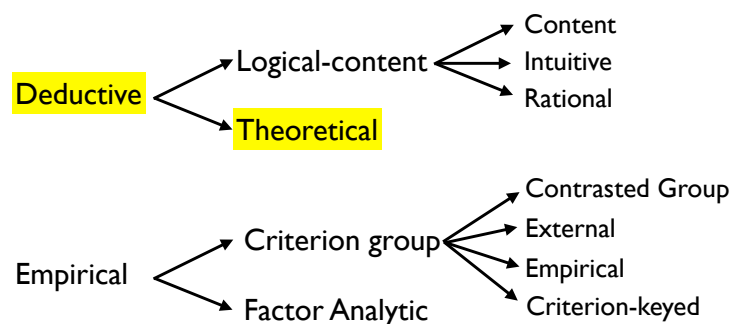
Sample Constructs & Measures

- BDI
- HAM-D (HRSD)

Beck Depression Inventory

- Aaron T Beck - Psychiatrist (with cognitive focus)
- BDI (1961), BDI-1A (1976)
- BDI-II (1996) - in response to DSM-IV
- 21 item self report
- 0-3 points per item
- Scoring
  - 0-9 minimal depression
  - 10-18 mild depression
  - 19-29 moderate depression
  - 30-63 severe depression

BDI-II

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness
0   I do not feel sad.
1   I feel sad much of the time.
2   I am sad all the time.
3   I am so sad or unhappy that I can't stand it.

2. Pessimism
0   I am not discouraged about my future.
1   I feel more discouraged about my future than I used to be.
2   I do not expect things to work out for me.
3   I feel my future is hopeless and will only get worse.

6. Punishment Feelings
0   I don't feel I am being punished.
1   I feel I may be punished.
2   I expect to be punished.
3   I feel I am being punished.

7. Self-Dislike
0   I feel the same about myself as ever.
1   I have lost confidence in myself.
2   I am disappointed in myself.
3   I dislike myself.

8. Self-Criticalness

1,320

BDI-II Questions

Sadness	Self-Criticalness	Loss of Energy
Pessimism	Suicidal Thoughts	Sleep Changes
Past Failure	Crying	Irritability
Loss of Pleasure	Agitation	Appetite
Guilty Feelings	Loss of Interest	Concentration
Punishment Feelings	Indecisiveness	Fatigue
Self-Dislike	Worthlessness	Interest in Sex

BDI-II Psychometrics

- Correlation with HAM-D : 0.71
- Test-retest: r = 0.93
- Cronbach's Alpha : 0.91

HAM-D aka HRSD

- Hamilton Rating Scale for Depression
- Max Hamilton - Psychiatrist 1912-1988
  - trained with Cyril Burt, UK edu psychologist / statistician - "father" of studies of heritability of IQ
- 17 item clinician rating
- 0-7 rating for each question
- Scoring:
  - 0-7 : normal
  - 20 + : moderate depression

HAM-D

Hamilton Depression Rating Scale (HDRS)

PLEASE COMPLETE THE SCALE BASED ON A STRUCTURED INTERVIEW

Instructions: for each item select the one "cue" which best characterizes the patient. Be sure to record the answers in the appropriate spaces (positions 0 through 4).

1 DEPRESSED MOOD (sadness, hopeless, helpless, worthless)
0   [ ] Absent.
1   [ ] These feeling states indicated only on questioning.
2   [ ] These feeling states spontaneously reported verbally.
3   [ ] Communicates feeling states non-verbally, i.e. through facial expression, posture, voice and tendency to weep.
4   [ ] Patient reports virtually only these feeling states in his/her spontaneous verbal and non-verbal communication.

2 FEELINGS OF GUILT
0   [ ] Absent.
1   [ ] Self reproach, feels he/she has let people down.
2   [ ] Ideas of guilt or rumination over past errors or sinful deeds.
3   [ ] Present illness is a punishment. Delusions of guilt.
4   [ ] Hears accusatory or denunciatory voices and/or experiences threatening visual hallucinations.

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HAM-D Questions

Depressed Mood	Retardation	Hypochondriasis
Feelings of Guilt	Agitation	Weight Loss
Suicide	Anxiety: Psychic	Insight
Insomnia: Early	Anxiety: Somatic	
Insomnia: Middle	Appetite	
Insomnia: Late	General Somatic Sx	
Work/Activities	Genital Symptoms	

HAM-D Psychometrics

- Often considered the "Gold Standard"
- Criticized for not being "Gold Standard"
- Bagby, Ryder et al (2004)
  - Pros:
    - test-retest: r= 0.81 to 0.98
    - Cronbach's alpha: r = 0.48 to 0.92
    - inter-rater: r = 0.65 to 0.98

HAM-D Psychometrics

- Cons:
  - poor item characteristics
  - "Most of the items still measure multiple constructs, items that have consistently been shown to be ineffective have been retained, and the scoring system still includes differential weighting of items…"

Factors?

- What if you don't know what the factors are?

Empirical Analysis

Multivariate data often appears to form natural groups
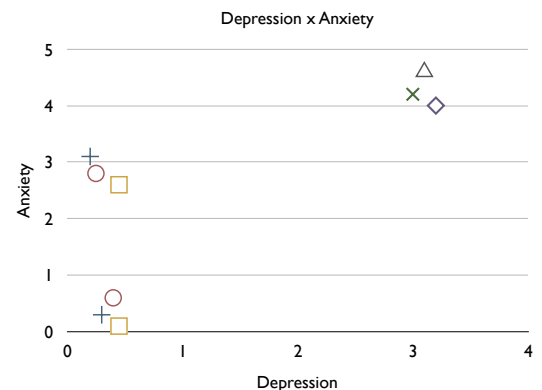
Empirical Analysis

"Natural" groupings in data are determined statistically
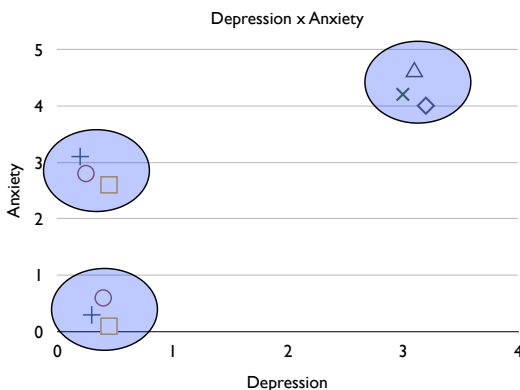
Empirical Analysis

Groups are then named using logical/content analysis
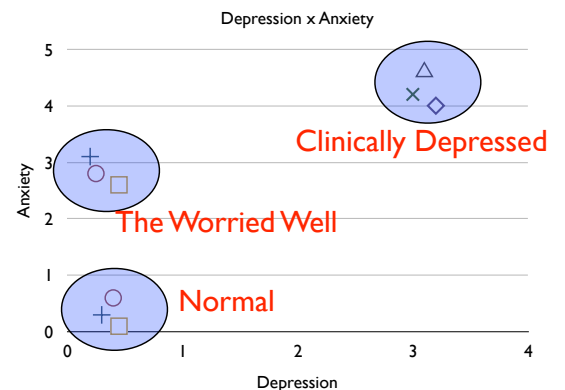
Clinically Depressed

The Worried Well

Normal

Review : Design Theories

Deductive →
- Logical-content →
  - Content
  - Intuitive
  - Rational
- Theoretical

Empirical →
- Criterion group →
  - Contrasted Group
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- Factor Analytic
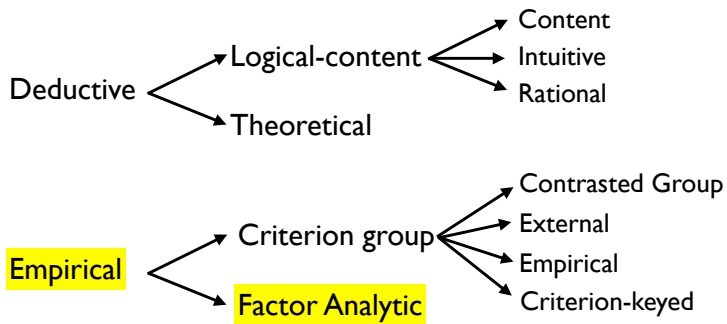
Factor-Analytic

- Empirical
  - Factor-Analytic
    - Ignore face-validity, content-validity or criterion-group.
    - Look for natural patterns in the data
    - Assume patterns are meaningful (not random)
    - Reduce redundant variables
    - Examine the content, name the factors

Factor Analysis

- Patterns within correlation matrix
- Compute *Factors* which account for maximum variance
- Factors: How many? Naming them?

Correlation Matrix

Measure	Factor 1	Factor 2
Love	**0.75**	0.17
Like	**0.87**	0.05
IQ	-0.02	**0.65**
GPA	0.10	**0.91**

Validity & Factor Analysis

- Convergent Validity : strong correlation
- Divergent Validity: weak correlation

Measurement   *Construct*

Love
Like   Affection
IQ
GPA   Intelligence
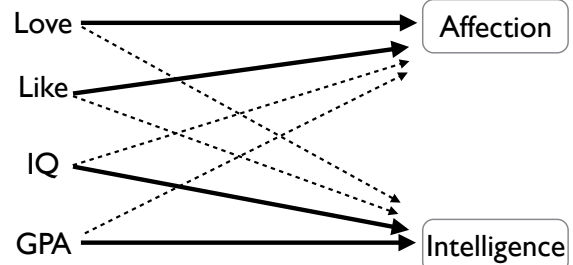
Factor-Analytic : 16PF

- Cattell's 16 Personality Factor Questionnaire (16PF)
  - 4504 traits chosen from dictionary, reduced to 171 traits.
  - These 171 items given to college students
  - Factor Analysis reduced these to 16 distinct factors (with 4-5 higher factors)
  - Extensive norms for age, gender, reading level, etc.
  - Similar test available for adolescents and children

16PF Factors

Scale	Low	High
A	cool, reserved	warm, outgoing
B	concrete, dull	abstract, bright
C	affected by feelings	emotionally stable
E	submissive, humble	dominant, assertive
F	sober, restrained	enthusiastic, spontaneous
G	expedient, indulgent	conscientious, conforming
H	shy, timid	bold, venturesome
I	tough-minded	tender-minded, sensitive
L	trusting, easy going	suspicious, skeptical
M	practical, down to earth	imaginative, absent-minded
N	forthright, genuine	shrewd, calculating
O	self-assured, secure	apprehensive, insecure
Q1	conservative, traditional	experimenting, liberal
Q2	group-oriented, joiner	self-sufficient, resourceful
Q3	undisciplined, lax	following self image, compulsive
Q4	relaxed, tranquil	tense, frustrated

Criticism : Factor-Analytic

- Major assumptions:
  - Data patterns (factors) are stable
  - Factors can be named from question content
- Flaws:
  - Factor analysis allows multiple solutions
  - # of factors is arbitrary (16 or 5 or 4?)
  - Naming factors : face-valid examination of data

Factor-Analysis

- FA of the MMPI-2 suggests there may be only 2 major factors! ("positive affectivity" and "negative affectivity")

Factor Analysis
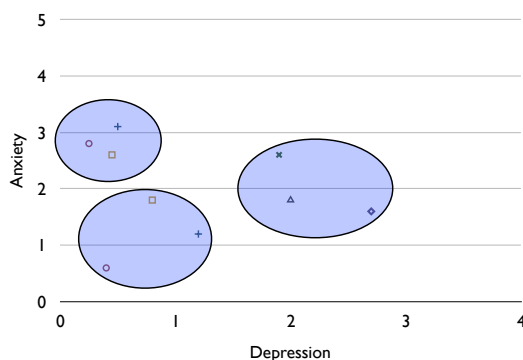
# of groups, and group boundaries can be arbitrary

Depression x Anxiety

Factor Analysis

3 groups? Or only two?

Depression x Anxiety
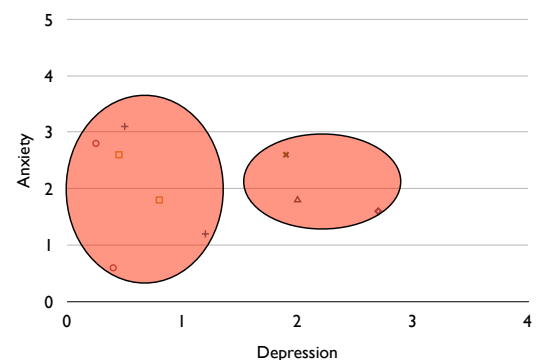
The "Big 5"

- Many researchers find 3 to 5 personality factors a good balance
- The 16PF factors reduce to 4 (or 5) bigger factors

Big 5 Personality Factors

Scale	Description
N	Neuroticism
E	Extraversion
O	Openness to experience
A	Agreeableness
C	Conscientiousness

NEO Personality Inventory

- NEO: "positive psychology" - health & style in normal subjects
- MMPI : psychopathology in abnormal subjects
- Versions
  - NEO : 3 factors (N,E,O)
  - NEO-PI: 5 factors (N,E,O, A,C)
  - NEO-PI-R
  - NEO-FFI (60-item version of NEO-PI-R)
  - NEO-PI-3
  - The NEO Five-Factor Inventory-3: Four-Factor Version (NEO-FFI-3:4FV)

NEO Facets

Scale	Description	Facets					
N	Neuroticism	anxiety	hostility	depression	self-conscious-ness	impulsive-ness	vulner-ability to stress
E	Extraversion	warmth	gregarious-ness	assertiveness	activity	excitement-seeking	positive emotion
O	Openness to experience	fantasy	aesthetics	feelings	actions	ideas	values
A	Agreeable-ness	trust	straight-forward-ness	altruism	compliance	modesty	tender-minded-ness
C	Conscientious ness	compe-tence	order	dutifulness	achieveme nt striving	self-discipline	delibera-tion