

# Science and Technology Enable Quick, Comprehensive Personality Disorder Assessment:

## The CAT-PD Project

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# DSM-IV/5 Def'n of Personality Disorder

“an enduring pattern of inner experience and behavior that deviates markedly from the expectations of the individual’s culture, is pervasive and inflexible, has an onset in adolescence or early adulthood, is stable over time, and leads to distress or impairment.” (APA, 1994, 2000)

# DSM-IV Personality Disorders

Cluster	Personality Disorder
A: Odd / Eccentric	Paranoid, Schizoid, Schizotypal
B: Dramatic / Emotional	Antisocial, Borderline, Histrionic, Narcissistic
C: Anxious / Fearful	Avoidant, Dependent, Obsessive-Compulsive
Appendix Diagnoses	Passive-Aggressive, Depressive

# Significance of Personality Disorder

- [ Prevalence of PD is approx. 10% in the general U.S. population and as high as 50% in psychiatric settings.
- [ PD is associated with:
  - significant interpersonal impairment
  - increased utilization of health care services
  - increased self-injury and suicidality
  - attenuated responses to many treatments
- [ Thus, assessment and treatment of personality pathology is important in applied and research settings.

# Problems with the Current System

- [ Excessive comorbidity
- [ Within-diagnosis heterogeneity
- [ Poor coverage of PD symptomatology
- [ Low stability of categorical PD diagnoses
- [ Poor convergent validity across measures
- [ Limited support for latent categorical models of PD

# Proposed DSM-5 Definition of PD

(DSM-5 website, July 2011)

A. Impairment in self or interpersonal functioning.

B. Core maladaptive personality traits.

C/D/E. Stable across time; Not better understood as a cultural norm; Not due to effects of substance or medical condition.

**BUT.... APA failed to support this new system. PDs in DSM-5 will be described identically to DSM-IV. More research needed.**

# Two Types of Dimensional Systems

- [ Measure existing PDs along continua:
  - still leads to problems with diagnostic overlap, convergent validity, heterogeneity, etc...
- [ Measure traits underlying the PDs:
  - the trait-dimensional approach

# SNAP Correlations with SIDP-IV PD Ratings

Scale	PAR	SZD	STP	ANT	BDL	HIS	NAR	AVD	DPN	OCP
Negative Temperament	<b>.41</b>				<b>.59</b>	<b>.31</b>			<b>.33</b>	
Mistrust	<b>.52</b>		<b>.36</b>		<b>.52</b>	<b>.34</b>		<b>.31</b>	<b>.39</b>	
Manipulativeness		<b>-.32</b>		<b>.43</b>			<b>.34</b>			
Aggression	<b>.43</b>			<b>.30</b>	<b>.37</b>					
Self-harm	<b>.38</b>		<b>.31</b>		<b>.65</b>			<b>.41</b>	<b>.48</b>	
Eccentric Perceptions			<b>.32</b>							
Dependency					<b>.50</b>			<b>.43</b>	<b>.59</b>	
Positive Temperament		<b>-.35</b>						<b>-.52</b>		
Exhibitionism		<b>-.42</b>		<b>.33</b>		<b>.42</b>	<b>.50</b>	<b>-.45</b>		
Entitlement							<b>.40</b>	<b>-.40</b>	<b>-.35</b>	
Detachment	<b>.34</b>	<b>.56</b>	<b>.32</b>					<b>.56</b>		
Disinhibition				<b>.56</b>						
Impulsivity				<b>.39</b>	<b>.30</b>					
Propriety										
Workaholism										<b>.45</b>

Note. N = 94. All rs > .26 are sig., p < .01. All scores are dimensional. **Highest correlation per PD.**

Clark, Simms, Wu, & Casillas (in press)

# SNAP Correlations with SIDP-IV PD Ratings

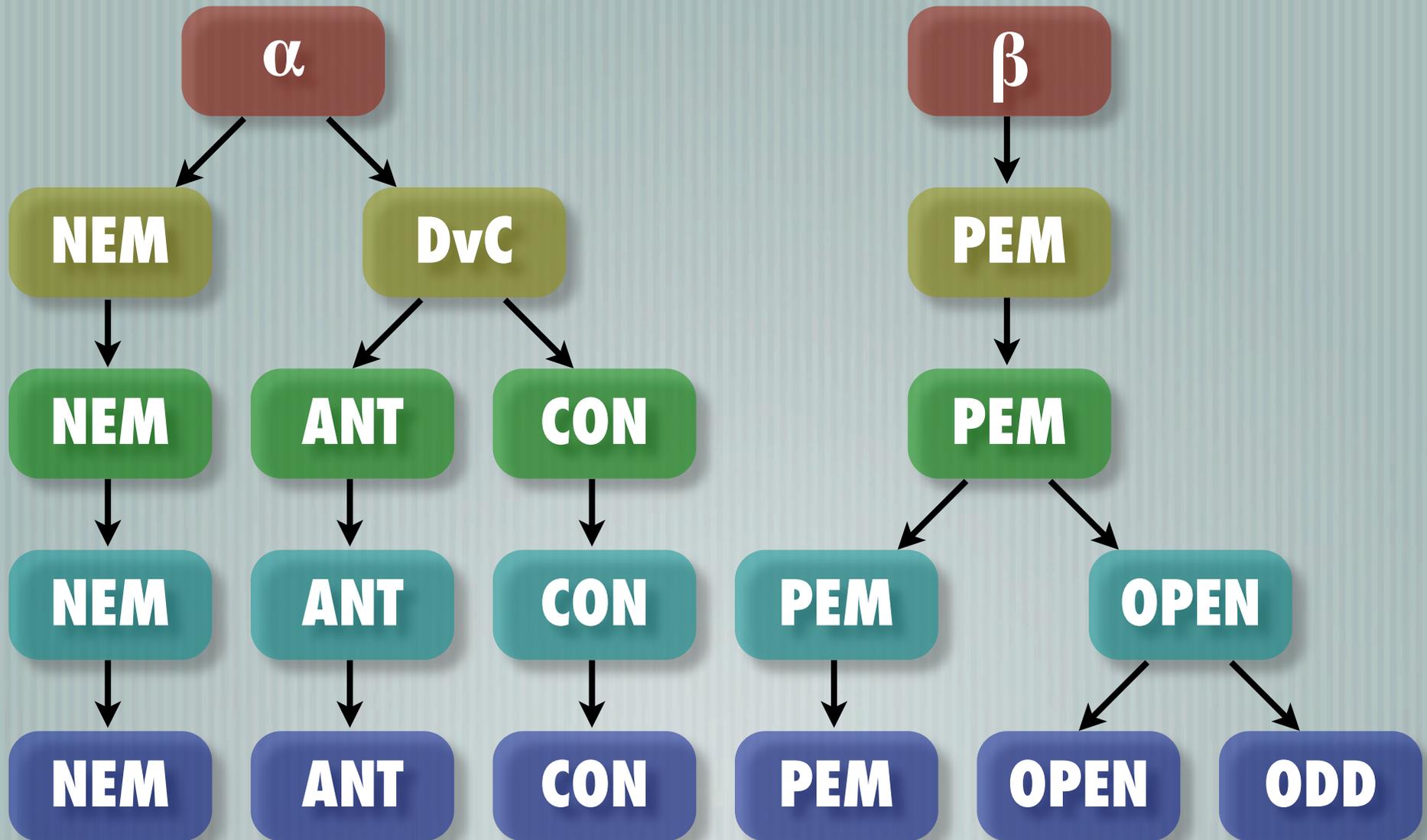
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# Trait-Dimensional Approaches

- [ Based on 50+ years of evidence from the “normal” and “abnormal” personality literatures.
- [ Fundamental dimensions underlying PDs are personality traits.
- [ Traits are building blocks we can use to formulate PDs empirically.
- [ Trait structure is hierarchical... e.g., Big 2, 3, 4, 5, 6, 7, +

# Hierarchy of Higher-Order Models



# How Trait-Dimensional Models Help

- Comorbidity? → PDs overlap due to common traits
- Heterogeneity? → Dimensional scales are homogenous
- Poor coverage? → Trait systems are more comprehensive
- Poor reliability? → Better alphas and temporal stability
- Poor validity? → Cleaner patterns of covariation
- Categories? → No such assumption made

# But... Which Personality Traits?

— [ Prominent trait-dimensional measure exemplars:

— NEO Personality Inventory-Revised (NEO PI-R)

— Schedule for Nonadaptive and Adaptive Personality (SNAP)

— Dimensional Assessment of Personality Pathology (DAPP)

— [ A large literature has emerged showing the links between these trait systems and personality disorder.

— [ But none is comprehensive; and efficiency is a concern.

# Other Models

- [ Widiger & Simonsen (2005, 2006) reviewed 18 trait approaches, organized into the FFM... 100+ possible traits!
- [ DSM-5 workgroup: 37 traits initially, but 25 now...
  - Personality Inventory for DSM-5 (PID-5; Krueger et al., 2011)
  - Problems with inputs and methods led to an incomplete model.
- [ More consensus for the higher order domains than for the lower order facets.

# Summary of Possible Lower-Order Dimensions

Widiger & Simonsen (2005, 2006)

**Extraversion vs. Introversion:** activity, aloofness, assertiveness, detachment, entitlement, excitement seeking, exhibitionism, exploratory excitability, extravagance, gregariousness, histrionic sexualization, intimacy problems, optimism, positive emotionality, restricted expression, schizoid orientation, shyness, sociability, social avoidance, social closeness, social potency, stimulus seeking, warmth, well-being

**Antagonism vs. Compliance:** aggression, agreeableness, alienation, altruism, attachment, callousness, compassion, compliance, conduct problems, dependency, diffidence, empathy, entitlement, helpfulness, insecure attachment, interpersonal disesteem, manipulateness, mistrust, modesty, narcissism, passive oppositionality, psychopathy, pure-hearted, rejection, sentimentality, social acceptance, social closeness, straightforwardness, submissiveness, suspiciousness, tender-mindedness, trust

**Constraint vs. Impulsivity:** achievement-striving, childishness, competence, compulsivity, conscientiousness, deliberation, disorderliness, dutifulness, eagerness of effort, harm avoidance, impulsivity, irresponsibility, obsessionality, order, perfectionism, propriety, resourcefulness, responsibility, risk taking, self-discipline, traditionalism, workaholism

**Emotional Dysregulation vs. Stability:** affective lability, alienation, angry hostility, anticipatory worry, anxiousness, dependency, depressiveness, dysphoria, emotional dysregulation, fear of uncertainty, hostility, hypochondriasis, identify problems, inferiority, introspection, irritability, negative affect, pessimism, self-acceptance, self-consciousness, self-harm, sensitivity, stress reaction, unhappiness, vulnerability, worthlessness

**Unconventionality / Oddity / Openness:** absorption, dissociation, eccentric perceptions, eccentricity, openness to experience, perceptual cognitive distortion, rigidity, spiritual acceptance, thought disorder, transpersonal identification

# Summary So Far...

- [ Categorical models of PD have problems, many of which are ameliorated by trait-dimensional systems.
- [ DSM-5 will include an experimental trait-based PD system, but more research is needed on this system.
- [ **Many dimensional systems exist... How are we to integrate?**
- [ **No single model/measure includes everything.**
- [ **Many trait measures are long and impractical in both research & applied settings...**

# The CAT-PD Project

Primary goals of the CAT-PD project:

**Develop an integrative and comprehensive model  
and efficient measure of PD traits.**

# Summary of Research Plan

- [ Phase 1: Develop constructs & initial item pool
- [ Phase 2: Data collection and structural analyses
  - 2a: 1,000+ community adults
  - 2b: 600+ current or recent psychiatric patients
- [ Phase 3: IRT calibration & CAT simulations
- [ Phase 4: CAT-PD software development
- [ Phase 5: Live testing study / Practical utility
  - Additional sample of 300 psychiatric patients

# Defining CAT-PD Traits/Items

Simms, Goldberg, Roberts, Watson, Welte, & Rotterman (2011)

- [ Started with Widiger & Simonsen's (2005,2006) list, which was rationally sorted, operationally defined, and reviewed by 28 international PD experts.
- [ Resulted in 59 candidate traits, organized by FFM/PSY-5
- [ Most items are based on Goldberg's **International Personality Item Pool (IPIP)**, rationally sorted into domains & trait bins by 11 trained research assistants.
- [ New items written by CAT-PD team to cover the extreme PD-relevant poles of each trait dimension.
- [ Initial item pool included 2,589 items for the first phase of data collection:
  - 1,570 IPIP items; 1,019 new items.
  - Average of 44 items per candidate trait.

# 59 Candidate Trait Dimensions

## **Neg. Emotionality**

Stress Reactivity  
Affective Lability  
Anxious Apprehension  
Fearfulness  
Depressive Dysphoria  
Shame/Guilt  
Low Self-Esteem  
Self-harm  
Suicidality  
Submissiveness  
Exploitability  
Rejection Sensitivity  
Jealousy  
Hypochondriasis

## **Positive Emotionality**

Activity/Energy  
Anhedonia  
Optimism vs. Pessimism  
Exhibitionism  
Seductiveness  
Dramaticism  
Entitlement  
Arrogance  
Emotional Detachment  
Social Avoidance  
Social Aloofness  
Romantic Disinterest

## **(Dis)Constraint**

Urgency  
Lack of Premeditation  
Lack of Perseverance  
Lack of Concern for Consequences  
Risk-taking / Recklessness  
Excitement Seeking  
Rigid Propriety  
Rebellious Nonconformity  
Perfectionism  
Excessive Achievement Striving  
Orderliness  
Undependability

## **Antagonism**

Callousness  
Manipulativeness  
Domineering  
Depravity  
Conduct Problems  
Aggression  
Anger / Irritability  
Hostility  
Blame Externalization  
Deceitfulness  
Oppositionality  
Selfishness  
Social Insensitivity

## **Oddity**

Magical Thinking  
Perceptual Aberrations  
Cognitive Dysregulation  
Obliviousness  
Absorption  
Peculiarity / Oddity  
Suspiciousness  
Cynicism

# Two Rounds of Data Collection

## Community study:

- Ps primarily recruited using random-digit dialing (RDD).
- Supplemented by targeted flyers, ads, & university.
- Goal: FAs to hone initial constructs and build preliminary scales.

## Patient study:

- Ps were current or recent psychiatric clients/patients.
- Recruited using flyers in mental health clinics.
- Goal: Cross-validation and further honing into final scales.

Balanced incomplete block design (BIBD) to deal with large number of items...

# Balanced Incomplete Block Design

Booklet	Items	Blocks of Trait Bins								
		1	2	3	4	5	6	7	8	9
<b>A</b>	<b>886</b>	<b>x</b>	<b>x</b>	<b>x</b>						
<b>B</b>	<b>828</b>	<b>x</b>			<b>x</b>	<b>x</b>				
<b>C</b>	<b>860</b>	<b>x</b>					<b>x</b>	<b>x</b>		
<b>D</b>	<b>831</b>	<b>x</b>							<b>x</b>	<b>x</b>
<b>E</b>	<b>892</b>		<b>x</b>		<b>x</b>		<b>x</b>			
<b>F</b>	<b>878</b>		<b>x</b>			<b>x</b>			<b>x</b>	
<b>G</b>	<b>899</b>		<b>x</b>					<b>x</b>		<b>x</b>
<b>H</b>	<b>851</b>			<b>x</b>	<b>x</b>					<b>x</b>
<b>I</b>	<b>866</b>			<b>x</b>		<b>x</b>		<b>x</b>		
<b>J</b>	<b>862</b>			<b>x</b>			<b>x</b>		<b>x</b>	
<b>K</b>	<b>840</b>				<b>x</b>			<b>x</b>	<b>x</b>	
<b>L</b>	<b>863</b>					<b>x</b>	<b>x</b>			<b>x</b>

# Community Sample Characteristics

N	1,273 [1,073 community; 200 college]
Ns/Block	range = 400 to 446
Sex	50.3% female
Race	59% White; 21% Asian; 18% Black; 1% Native American
Hispanic	5%
Age	M = 48 ( $\pm 17.0$ ); range = 18-87
Rel. Status	27% married; 14% div/sep/wid; 54% never married
Highest Degree	42% high school; 27% BA/BS; 10% graduate degree
Urban-Rural	53% urban; 42% suburban; 5% rural

# Patient Sample Characteristics

N	628
Ns/Block	range = 187 to 224
Sex	63.6% female
Race	63% White; 34% Black; 2% Native American; 1% other
Hispanic	5%
Age	M = 43 ( $\pm 12.5$ ); range = 18-77
Rel. Status	18% married; 31% no longer married; 50% never married
Highest Degree	39% high school; 21% BA/BS; 8% graduate degree
Urban-Rural	59% urban; 33% suburban; 7% rural

# Structural Data Analyses

- [ Block Design yielded ~400 Ps and 200 Ps for within-block analyses in community and patient samples, respectively.
- [ FAs were iteratively conducted at the item level, based on matrices of polychoric correlations.
- [ Most FAs completed within blocks to maximize N. Some cross-block FAs to hone targeted scales.
- [ **Today: Summary of the final CAT-PD scales...**

# Negative Emotionality

<b>INITIAL TRAITS</b>	<b>CAT-PD</b>	<b>PROPOSED DSM-5</b>
Stress Reactivity	Affective Lability	<b>Emotional Lability</b>
Affective Lability		
Anxious Apprehension	Anxiousness	<b>Anxiousness</b>
Fearfulness		
Depressive Dysphoria	Depressiveness	<b>Depressivity</b>
Shame/Guilt		
Low Self-Esteem/Pessimism	Self-harm	?????
Non-suicidal Self-injury		
Suicidality	Submissiveness	<b>Submissiveness</b>
Submissiveness		
Exploitability	Relationship Insecurity	<b>Separation Insecurity</b>
Rejection Sensitivity		
Jealousy	Health Anxiety	?????
Hypochondriasis		

# Positive Emotionality

INITIAL TRAITS	CAT-PD	PROPOSED DSM-5
Anhedonia	Anhedonia	Anhedonia
Activity/Energy		
Exhibitionism	Exhibitionism	Attention Seeking
Seductiveness		
Dramaticism		
Entitlement	Grandiosity	Grandiosity
Arrogance		
Social Avoidance	Social Withdrawal	Withdrawal
Social Aloofness		
Emotional Detachment	Emotional Detachment	Restricted Affectivity
Romantic Disinterest	Romantic Disinterest	Intimacy Avoidance

# (Dis)Constraint

## INITIAL TRAITS

## CAT-PD

## PROPOSED DSM-5

Urgency

(to Affective Lability)

Lack of Premeditation

Non-Premeditation

Lack of Concern for Consequences

Non-Perseverance

Lack of Perseverance

Risk-taking / Recklessness

Risk Taking

Excitement Seeking

Perfectionism

Perfectionism

Orderliness

Undependability

Irresponsibility

Excessive Achievement Striving

Workaholism

Rigid Propriety

Rigidity

**Impulsivity**

**Perseveration  
(Distractibility?)**

**Risk-taking**

**Rigid Perfectionism**

**Irresponsibility**

?????

?????

# Antagonism

INITIAL TRAITS	CAT-PD	PROPOSED DSM-5
Callousness	Callousness	Callousness
Selfishness		
Manipulativeness	Manipulativeness	Deceitfulness Manipulativeness
Deceitfulness		
Blame Externalization		
Domineering	Domineering	?????
Conduct Problems		
Depravity	Norm Violation	?????
Oppositionality		
Rebellious Nonconformity		
Aggression	Hostile Aggression	Hostility
Hostility		
Anger / Irritability	Anger	?????
Social Insensitivity	Rudeness	?????

# Oddity

## INITIAL TRAITS

Magical thinking  
Perceptual Aberrations  
Cognitive Dysregulation  
Obliviousness  
Absorption  
Peculiarity  
Suspiciousness  
Cynicism

## CAT-PD

Unusual Beliefs  
Unusual Experiences  
  
Cognitive Problems  
  
Fantasy Proneness  
Peculiarity  
  
Mistrust

## PROPOSED DSM-5

Unusual Beliefs & Experiences  
Perceptual Dysregulation  
  
?????  
  
?????  
Eccentricity  
  
Suspiciousness

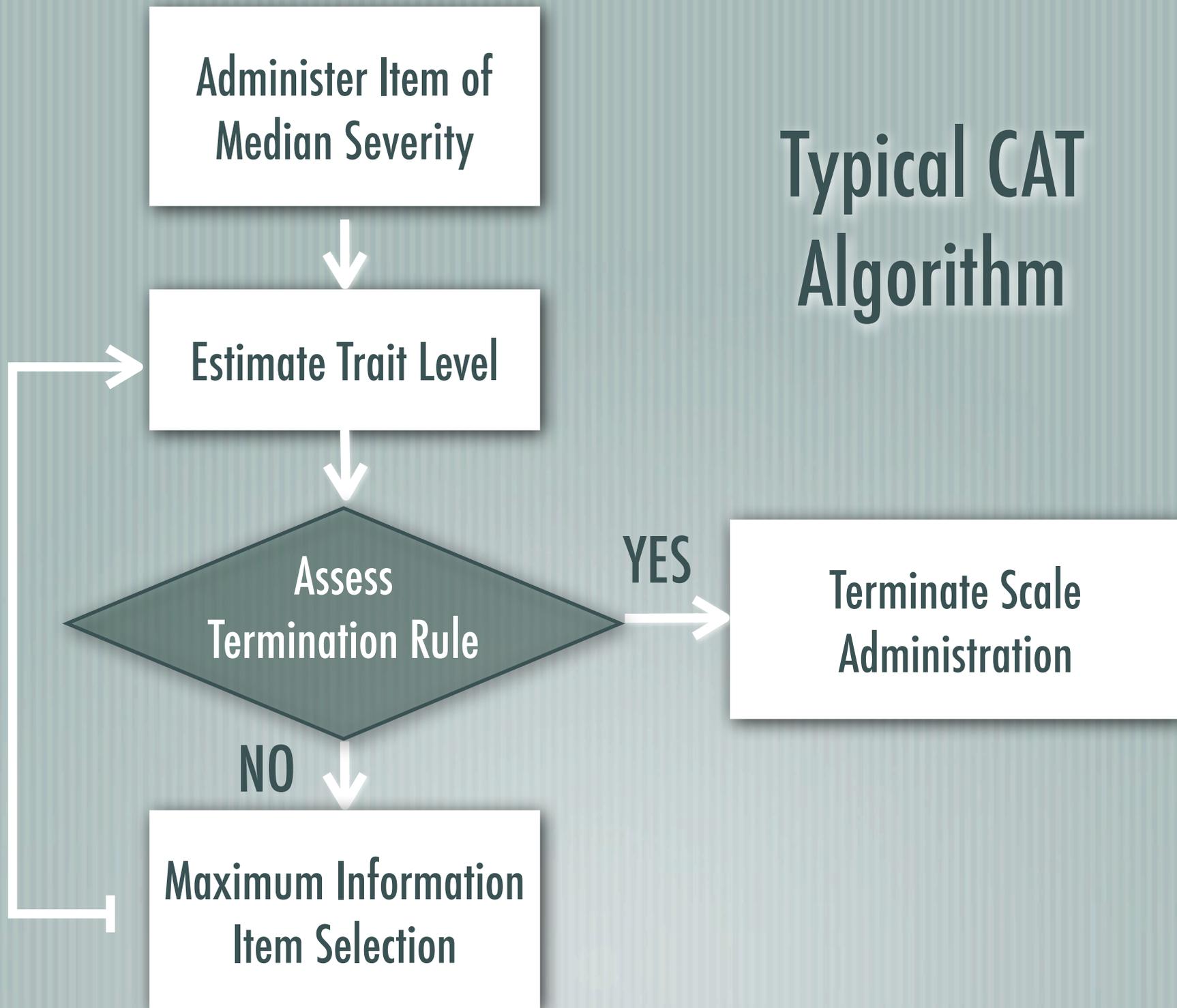
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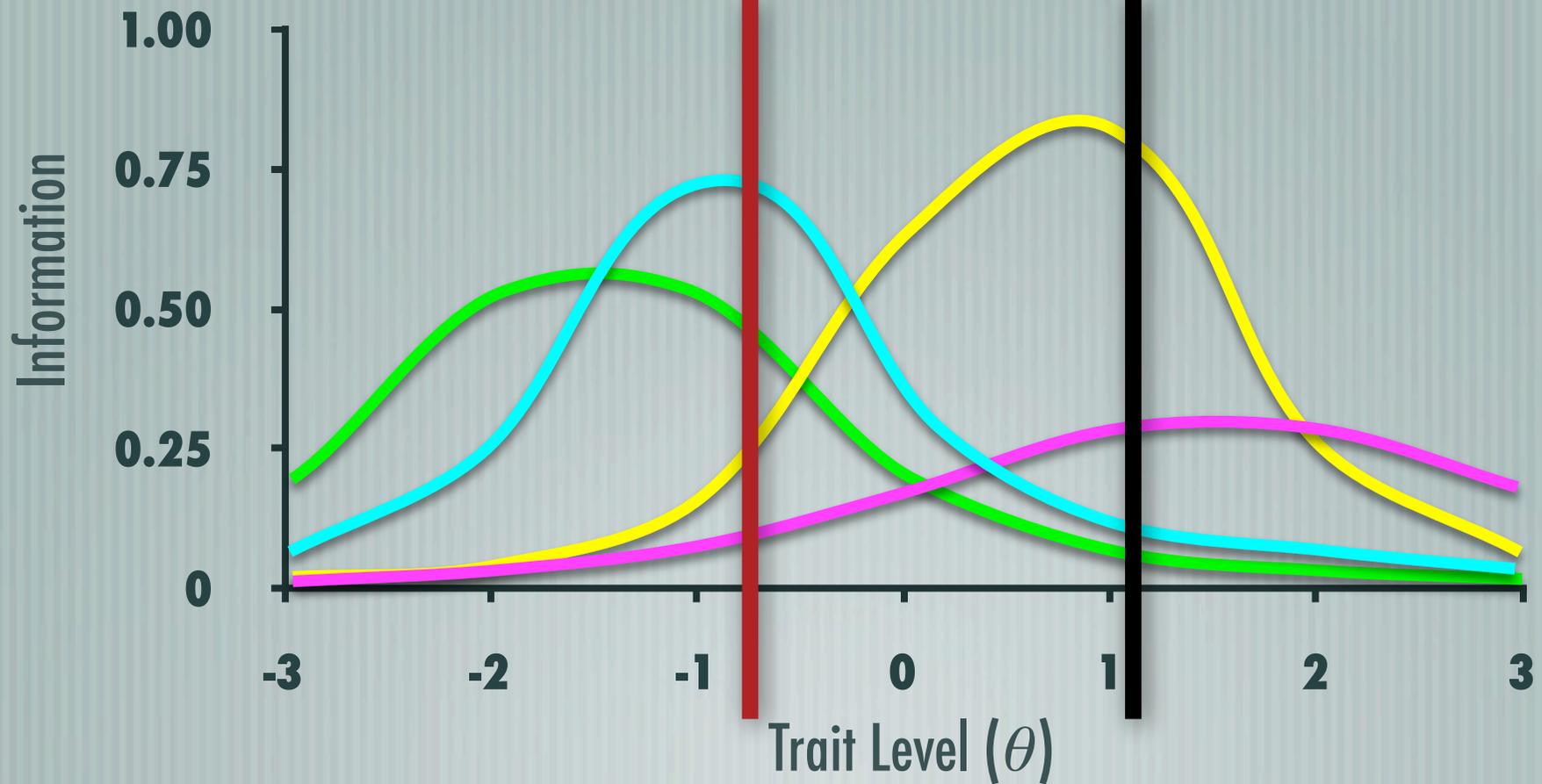
# Computerized Adaptive Testing (CAT)

- [ Tests tailored to individuals.
- [ Administers only items that provide optimal information given person's trait level.
- [ Built on a strong foundation of Item Response Theory (IRT)
- [ Marked efficiency over P&P tests, with little or no cost to measurement precision & validity.
- [ Being implemented in CAT-PD measure to facilitate more efficient measurement of all traits (under development).

# Typical CAT Algorithm



# IRT Item Information Curves



# IRT, CAT, & Personality

— [ IRT-based CATs starting to appear in the personality literature:

— Waller & Reise (1989): **MPQ**

— Kamakura & Balasubramanian (1989): **CPI**

— Reise & Henson (2000): **NEO PI-R**

— Waller (1999): **MMPI-2**

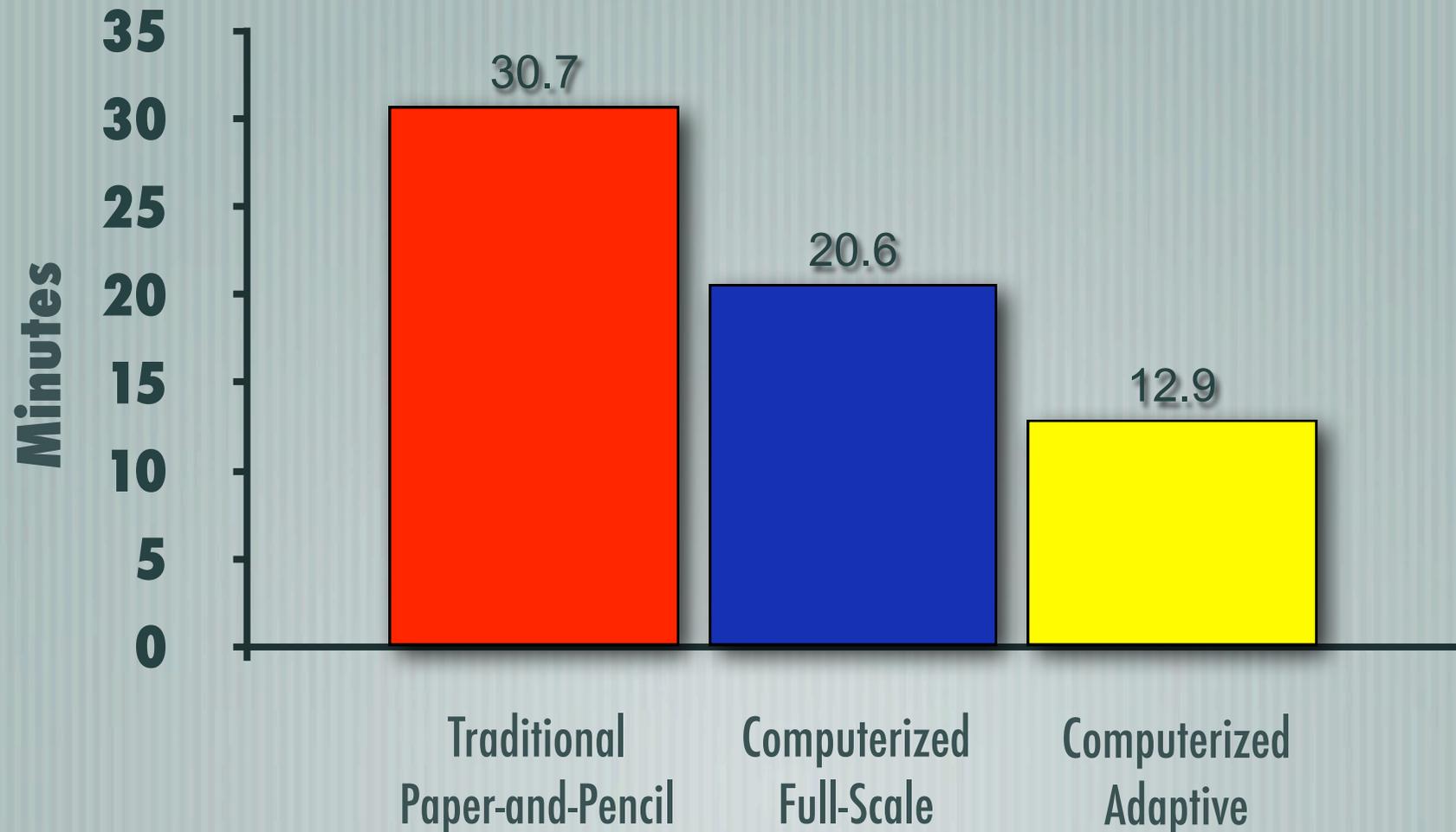
— Simms & Clark (2005): **SNAP/SNAP-2**

— [ Only Simms & Clark (2005) tested a live personality/PD CAT.

— [ None have yielded operational CATs for personality disorder.

# CAT Time Savings

Simms & Clark (2005)



# Summary & Conclusions

- [ Trait-dimensional models of PD show clear advantages over the DSM-based categorical system.
- [ Consensus is emerging on the higher-order PD trait domains, but much less is certain at the lower-order facet level.
- [ We integrated across all prominent PD trait models and identified 59 candidate traits.
- [ Community and Patient structural analyses honed that list to 33 final traits.

# Summary & Conclusions

- [ CAT will facilitate efficient & flexible measurement...
  - ETA Fall 2013... final validation study to come.
- [ In the interim, we have developed a static form (CAT-PD-SF) measuring all 33 traits with 212 items (all alphas  $\geq .80$ ).
- [ The final model/measure is in a strong position to inform the structure of PD traits and future DSM-5 based research.
- [ Our results suggest the proposed DSM-5 trait model is incomplete.
  - e.g., traits missing: self-harm, norm violation, health anxiety, workaholism, rigidity, domineering, anger, rudeness, cognitive problems, fantasy proneness.

# Implications for Treatment & Research

- [ Likely future changes to the DSM and the emergence of elaborated trait models will serve to de-emphasize traditional disorder-specific treatment approaches.
- [ Trait-based PD models could/should lead to treatment plans targeting specific traits or trait profiles, rather than “disorders.”
- [ Research into these trait-treatment relations is needed.
- [ Cross-cutting “trans-diagnostic” dimensions are the future of funded psychiatric research (see NIMH’s RDoC Initiative).

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**Lots of Research Assistants**

**Lots of Participants**

# Thank you.

If you are interested in the CAT-PD measure, please contact me at [ljsimms@buffalo.edu](mailto:ljsimms@buffalo.edu)