

Personality, Motivation, and Cognitive Performance:

**a theory of individual differences in cognitive
performance**

Personality, Motivation, and Performance

- The who, what, where, why, and when of behavior
- Who (individual differences)
- What (task variables)
- Where (situational variables)
- Why (motivational variables)
- When (temporal sequencing and cumulative performance)

Personality traits and individual differences (Who)

American taxonomies-**The Big 5**

Surgency or extraversion

Agreeableness

Conscientiousness

Emotional Stability

Culture/Openness

European biological taxonomies- **“Giant 3”**

Introversion/extraversion (Sociability, Impulsivity, Surgency)

Neuroticism (anxiety, emotionality)

Tough mindedness (Aggression, Masculinity?)

Background variables

- Biological bases

 - Genetic predispositions

 - Biological substrates

- Past history

 - Knowledge

 - Past history of reinforcement leading to current expectations

Biological bases

A. Genetic predispositions

polygenetic inheritance

moderate heritabilities

B. Biological substrates

1. Conceptual Nervous System

Behavioral Activation System

Behavioral Inhibition System

Fight/Flight/Freezing System

2. Arousal System (one or many?)

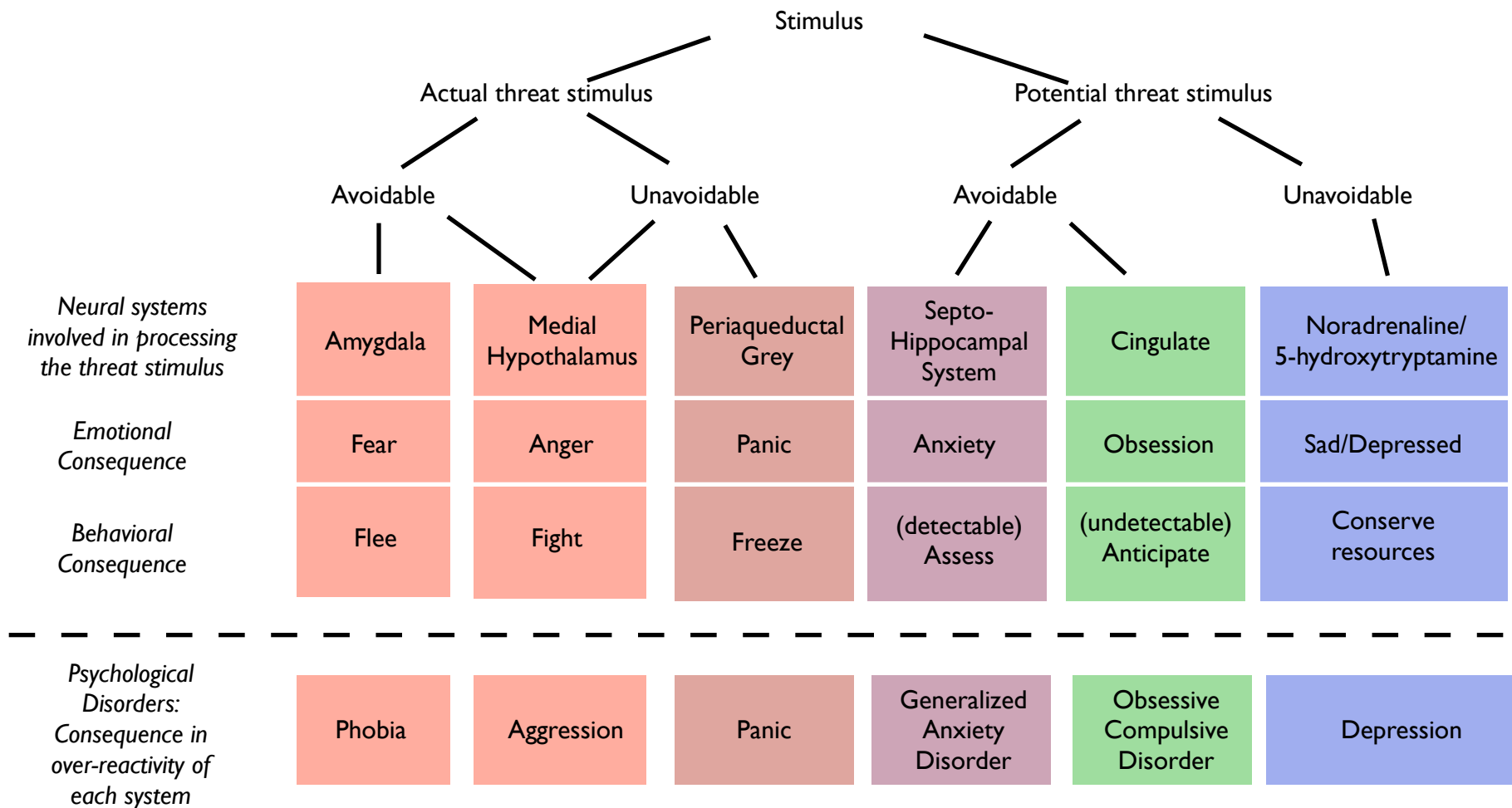
energetic arousal tense arousal

3. Sensitivities to reinforcement

sensitivity to rewards

sensitivity to punishments

Nature of stimulus & the relation to neural systems, function, emotion & disorders



(Adapted from p.295, Gray & McNaughton (2000))

Past history

Knowledge

Declarative

episodic memories (of)

semantic memories (that)

Procedural (how)

Skills

Classical conditioning

Past history of reinforcement leading to current
expectations

expectations of rewards

expectations of punishment

Situational variables (Where)

- primary effects on direction
- primary effects on intensity
- Mixed effects

Situational effects on direction

Expectancies of success and failure

task difficulty

comparison level

Extrinsic demands

rewards

threats

Public versus private feedback

Situational effects on intensity

time of day

stimulant drugs

depressant drugs

exercise

Effects on direction and intensity

Noise

time pressure

presence of others

Motivational Variables (Why)

Motives (see also personality traits)

need for achievement

need to avoid failure

need affiliation

need for stimulation?

Motivational variables (why)

Motivational level:

Directional

approach

avoidance

Intensity

energetic arousal

tense arousal

Task Variables (What)

Multiple types of demands

Detection

Encoding

Storage

Retrieval

Processing

Task variables (what)

Attentional demands

Detecting

Filtering

Sustaining

Memory demands

Immediate versus delayed processing

Capacity of immediate memory

Outcome measures

Immediate measures

Task choice

Time spent

- latency of choice

- persistence of choice

Intensity

Efficiency

speed/accuracy/quality of performance

rate of acquisition of task

asymptotic level

Cumulative achievement

Ability

knowledge base

application of knowledge

Efficiency

curvilinear function of motivation?

function of task difficulty?

Time spent

Efficiency of performance

Curvilinear function of motivation?

Humphreys-Revelle model

arousal facilitates attention

arousal facilitates long term memory storage

arousal hinders immediate (working) memory

Anderson-Revelle model

beneficial effects of energetic arousal

detrimental effects of tense arousal

optimal and non-optimal performance

Yerkes-Dodson Law and the function of task difficulty

Control systems and feedback

- Short term feedback loops
 - Motivational carryover
 - motivation for incomplete acts persists
 - completion quenches motivational state

Task choice as function of time and alternatives

Control systems and feedback

- Long term feedback loop
 - expectancy of success = $f(\text{history of success, sensitivity to success})$
 - expectancy of failure = $f(\text{history of failure, sensitivity to failure})$
 - self efficacy = balance of expectancy of success and failure

Strategic tradeoffs

Speed versus accuracy

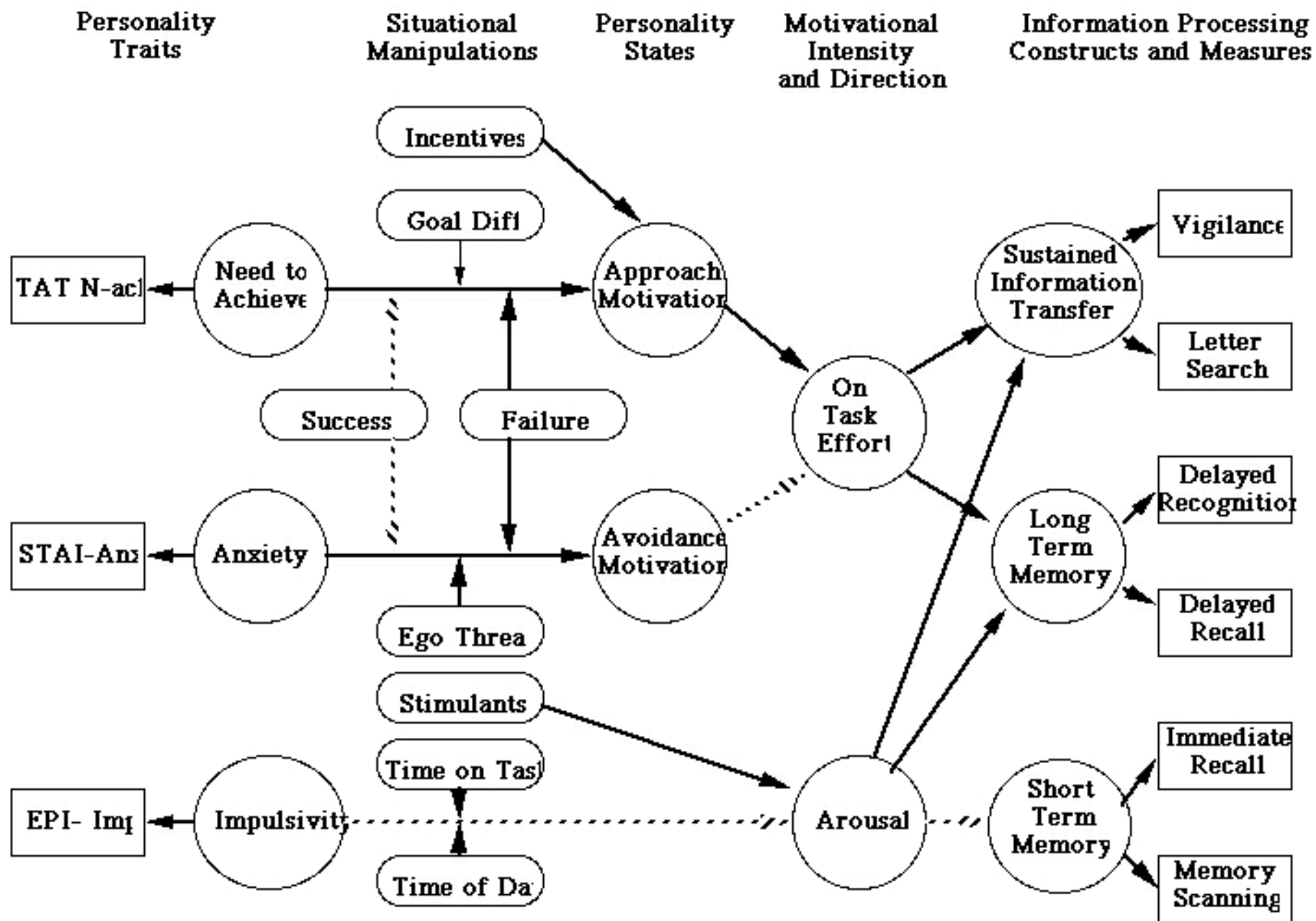
Time spent to achieve goal 1 is time not spent
to achieve goal 2

studying versus socializing

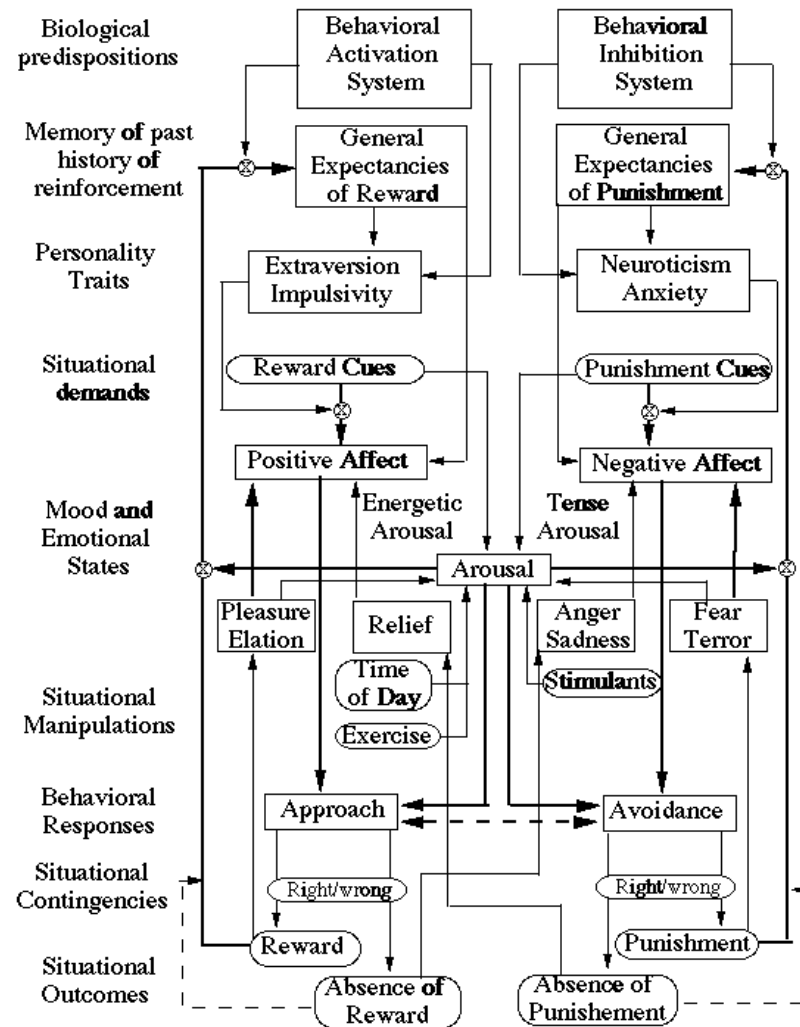
career versus family

Personality and Performance

- Interplay of the who, what, where, why and how.
- To study personality we need to answer all of these questions.



Yet another “plumbing diagram” relating personality, affect, and cognition

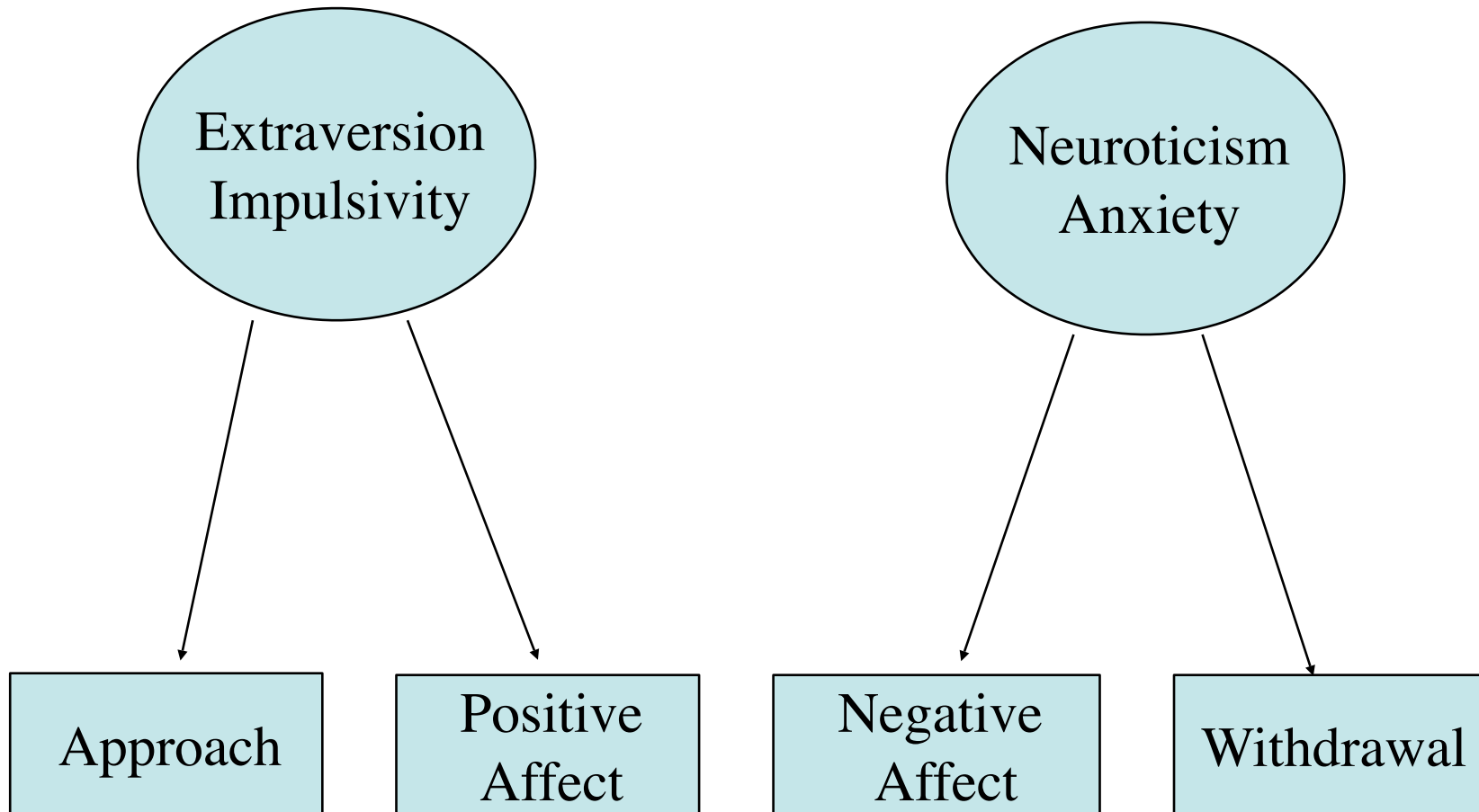


Personality and Performance:

Another perspective

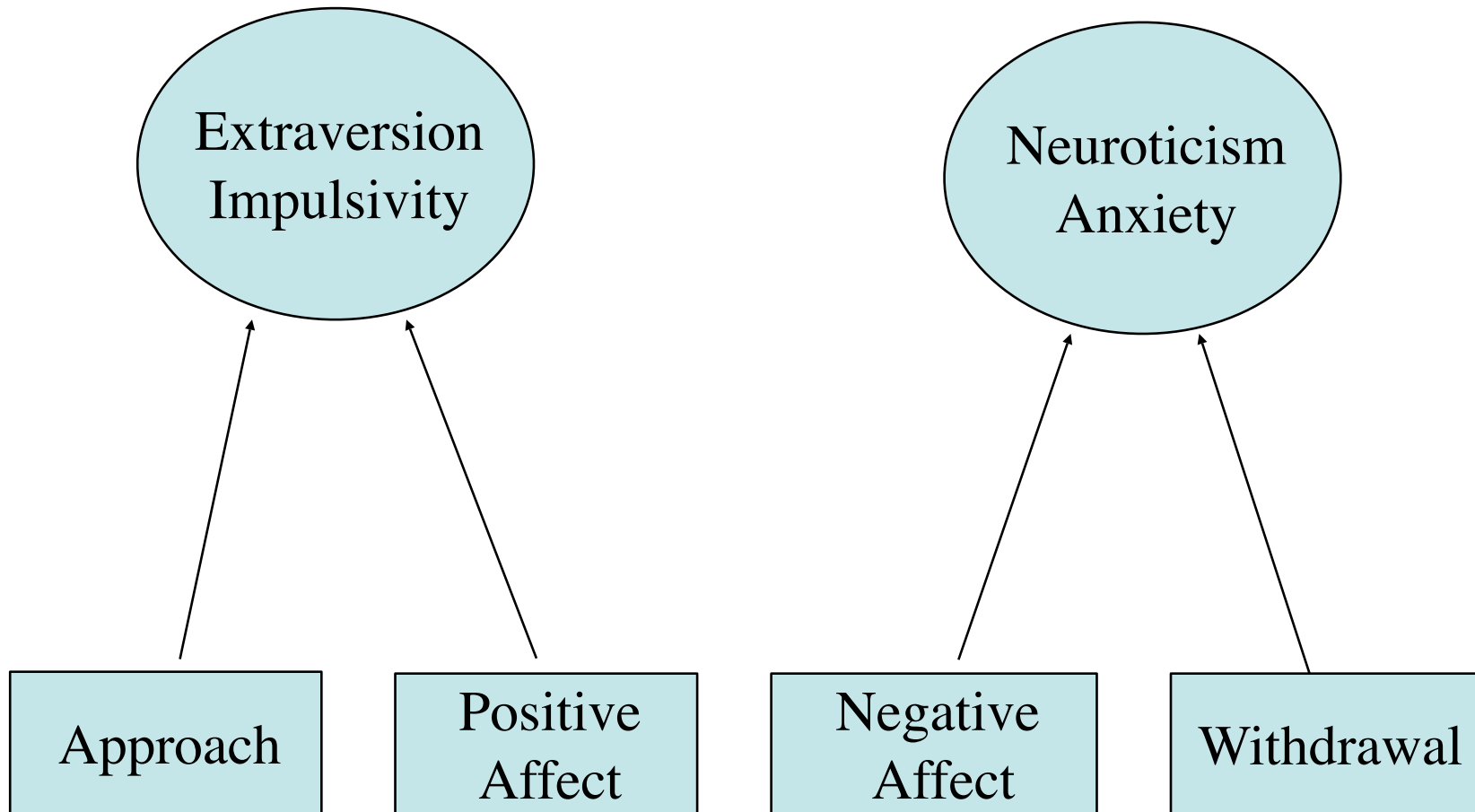
- Personality as coherent pattern over time of Affect, Behavior, Cognition and Desire
 - Affect/Energy
 - Positive, Negative, Energetic, Tense
 - Behavior
 - Approach, Withdrawal, Inhibition
 - Cognition
 - Knowledge Structures, breadth
 - Desires and Goals
 - Needs, Wants

Traditional Model: Causal factors



Alternative Model

Descriptive summaries



Achievement Motivation and the ABCDs

- Achievement as positive Affect upon success
- Achievement as approach Behavior
- Achievement motivation as Cognitive appraisals of task difficulty
- Achievement motivation as Goal setting

Extraversion and the ABCDs

- Extraversion as positive Affect
- Extraversion as approach Behavior
- Extraversion as cognitive bias towards rewards
- Extraversion as performance approach Desires

Anxiety and the ABCDs

- Anxiety as negative Affect
- Anxiety as avoidance Behavior
- Anxiety as cognitive bias towards threats
- Anxiety as performance avoidance Desires

Ways of studying Personality coherence and Affect, Behavior, Cognition, and Goals

- Between individual differences across items
- Between individual differences across situations and across time
- Within person variation across items, situation and time
- Are within person patterns different across people?

The ABCDs of personality

Affect	What we feel
Behavior	What we do
Cognition	What we think
Desire/Goals	What we want
Environment	Where we are

The Big 5 and the ABCDs

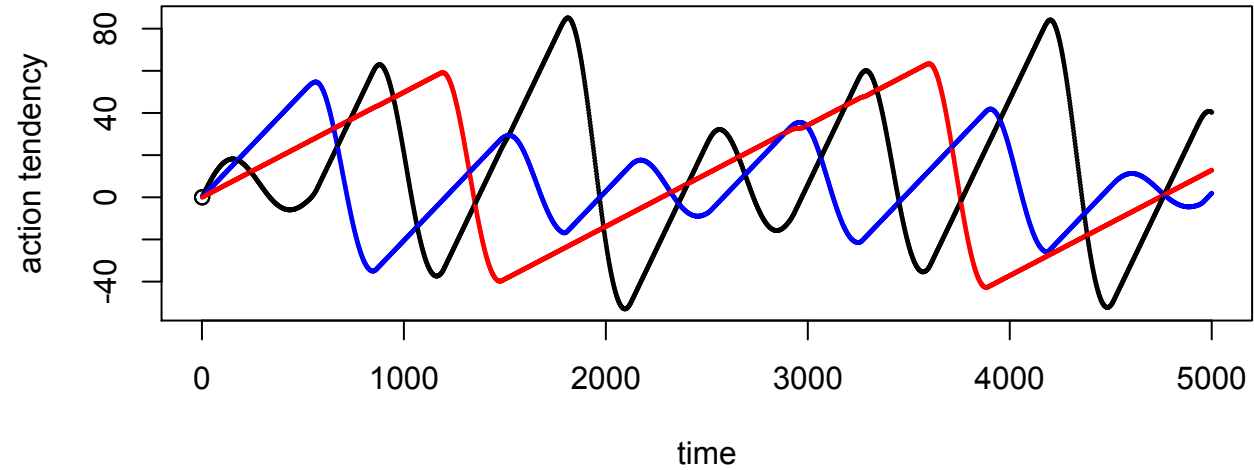
		E	N	C	A	O
Affect	Pos	+	0		+	+
	Neg	0	+			0
Behavior	App	+	0		+	+
	Avoid/ Inhibit*	0	+			
	F/F/F				+	
Cognition	+ bias	+				
	- bias	0	+	+		
	broad	+		-		+
Desires	mastery			+		+
	success	+		+		
	avoid	0	+	+		
	long term	-		+		

Tests of theory

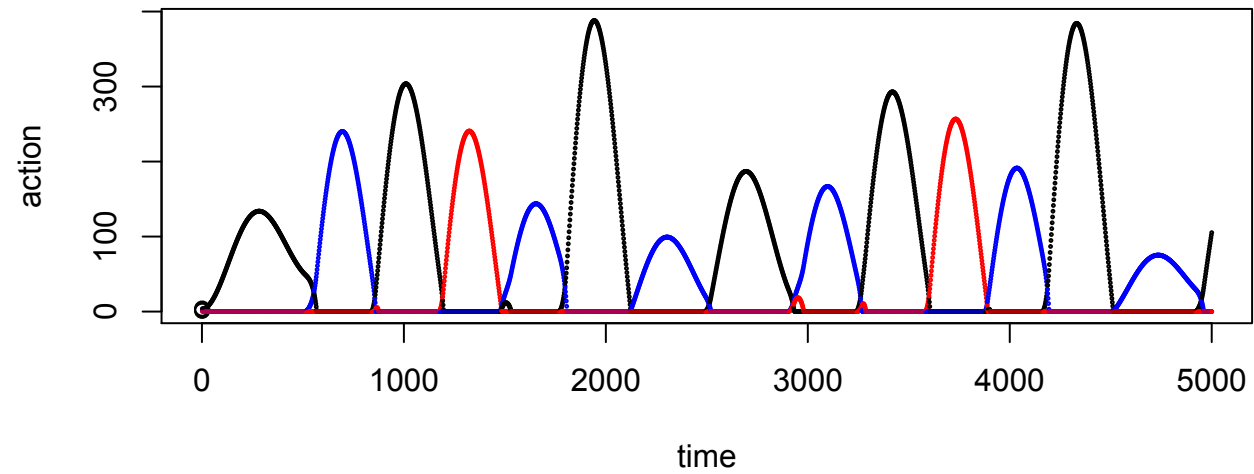
- Classic experimental design
- Correlational designs
- Computer formalism (Cues-Tendency-Action model)
- Computer simulations and “real life appearance”

CTA model

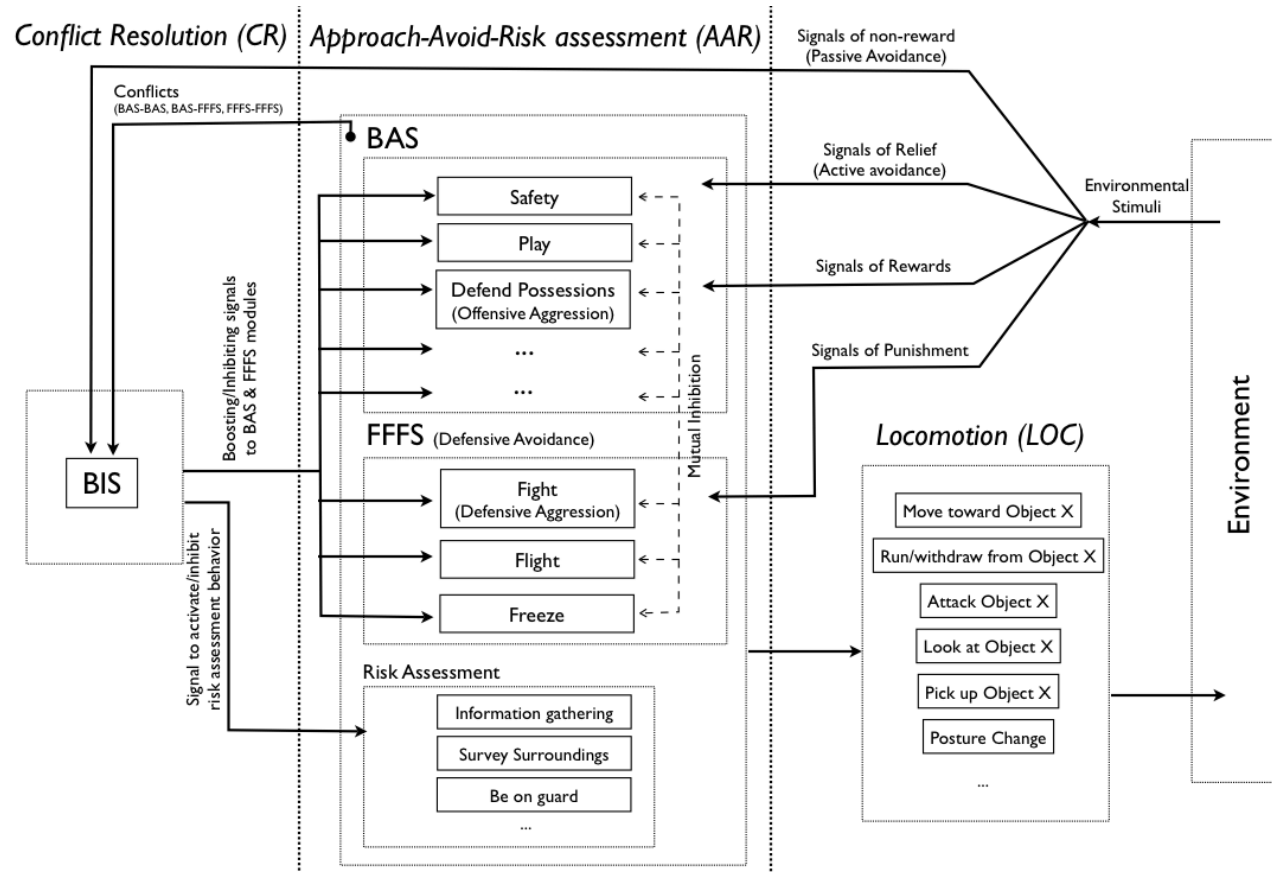
Action Tendencies over time



Actions over time



Implementing RST in Twig



Testing Theory by simulation

- Cues Tendency Action model
- Computer implementation of RST