

# **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”**

**Introversiion/extraversiion** (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

# 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

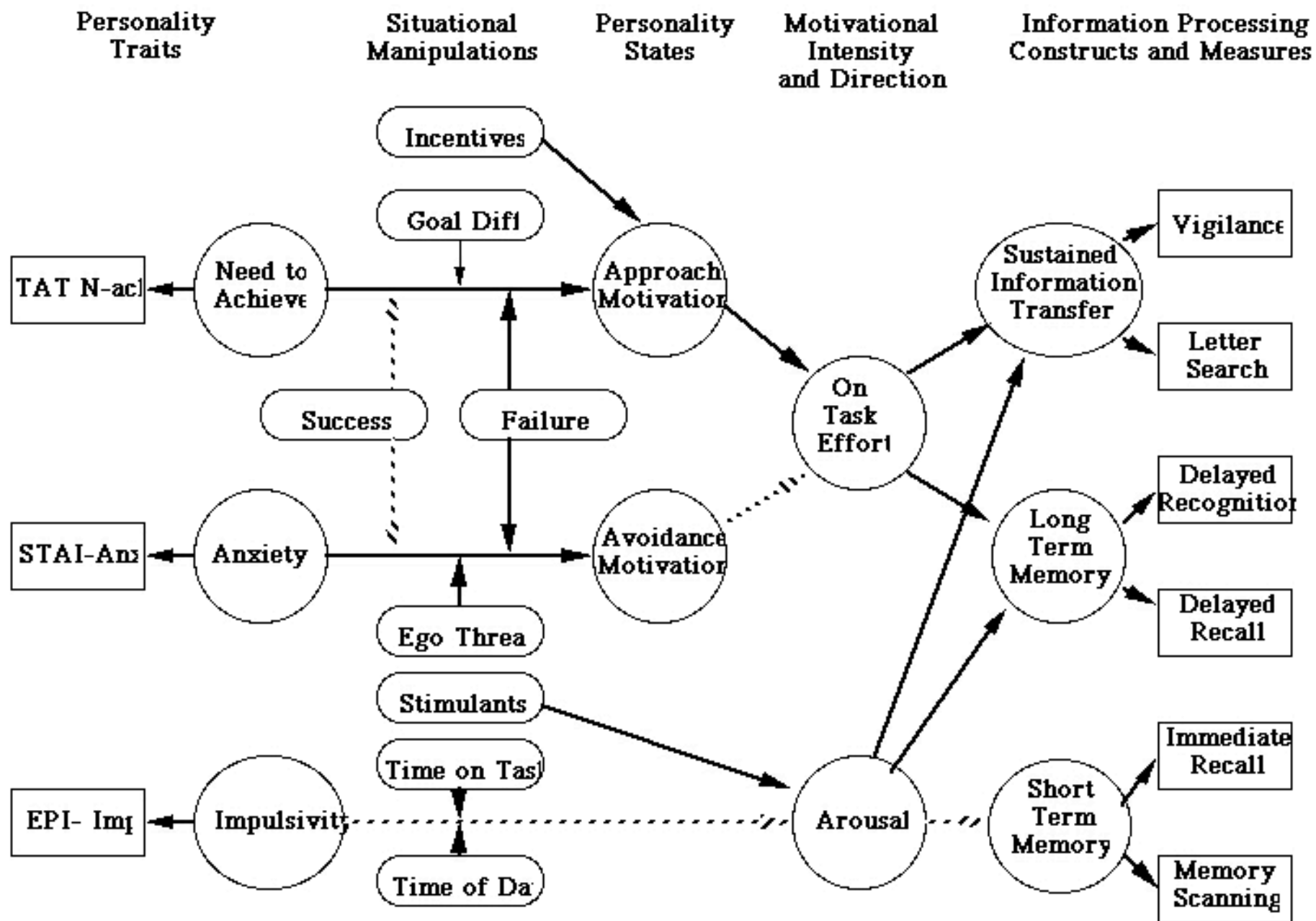
Time spent to achieve goal 1 is time not spent  
to achieve goal 2

studying versus socializing

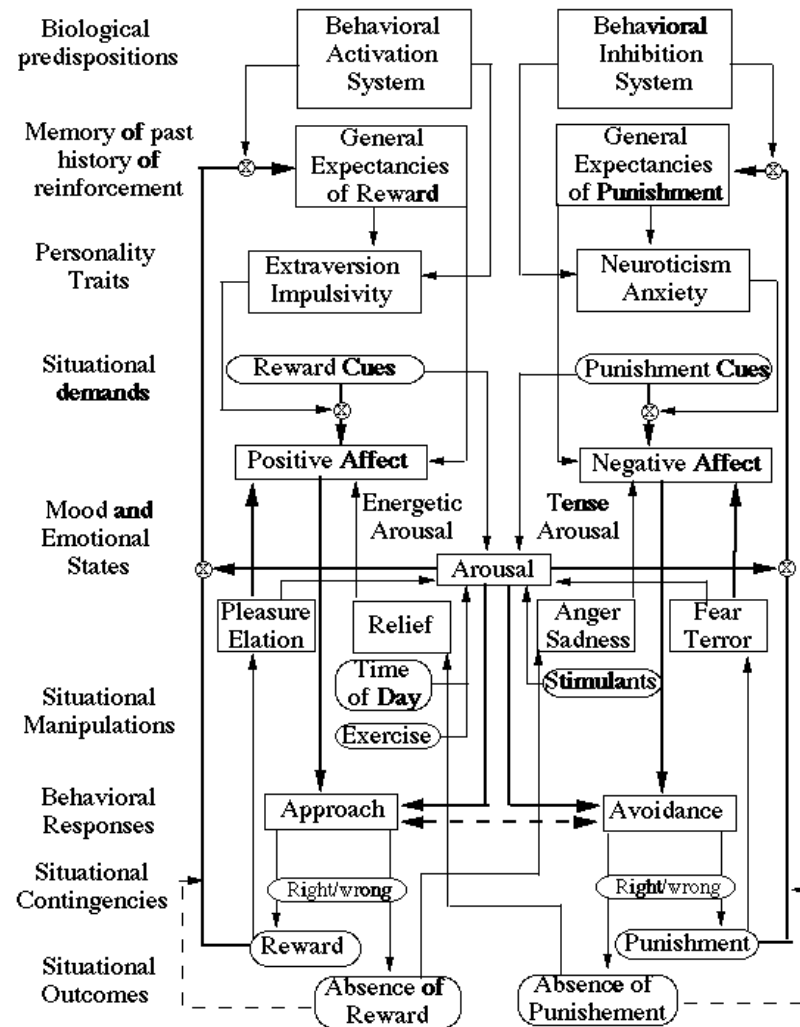
career versus family

# 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



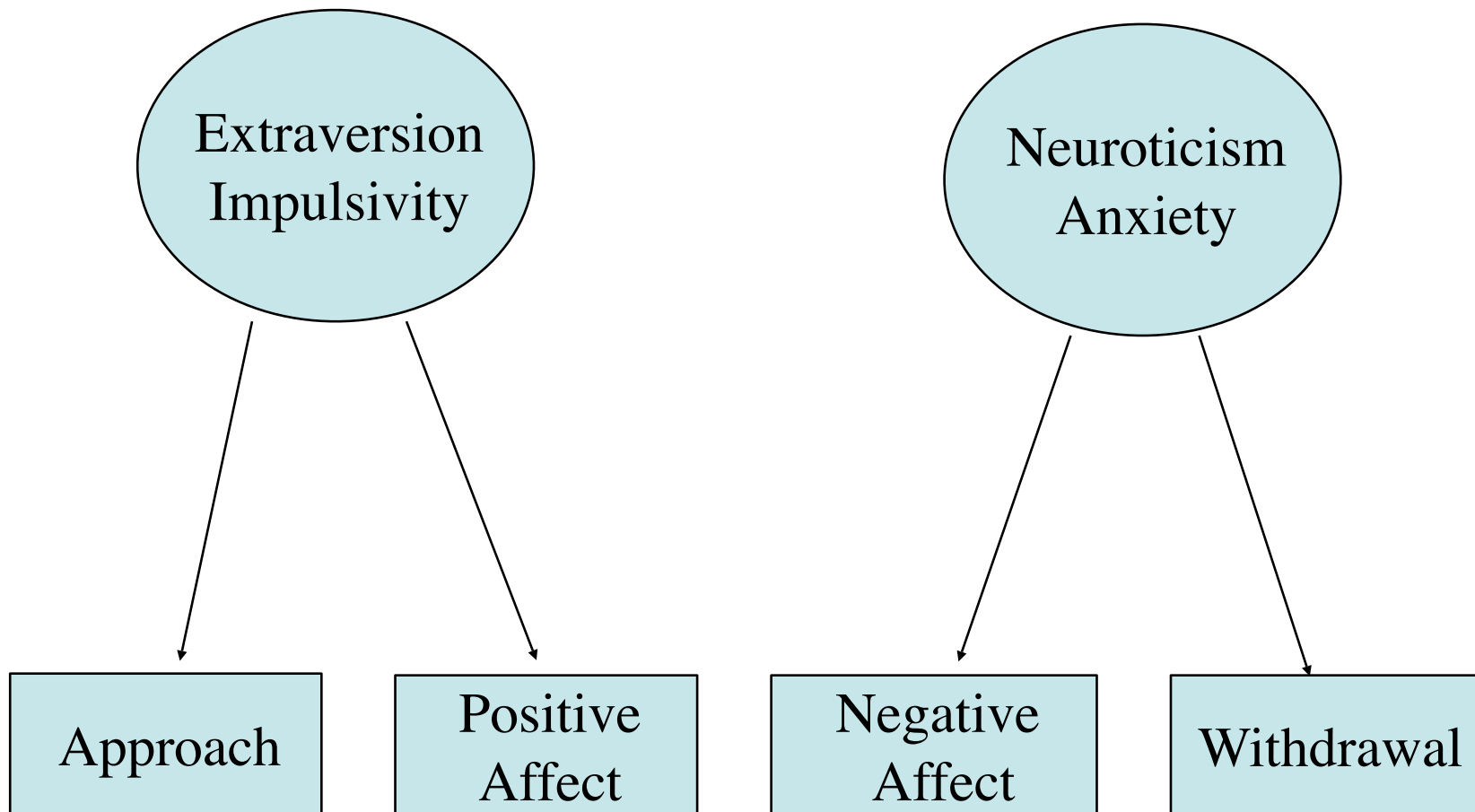
# Personality and Performance:

## 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

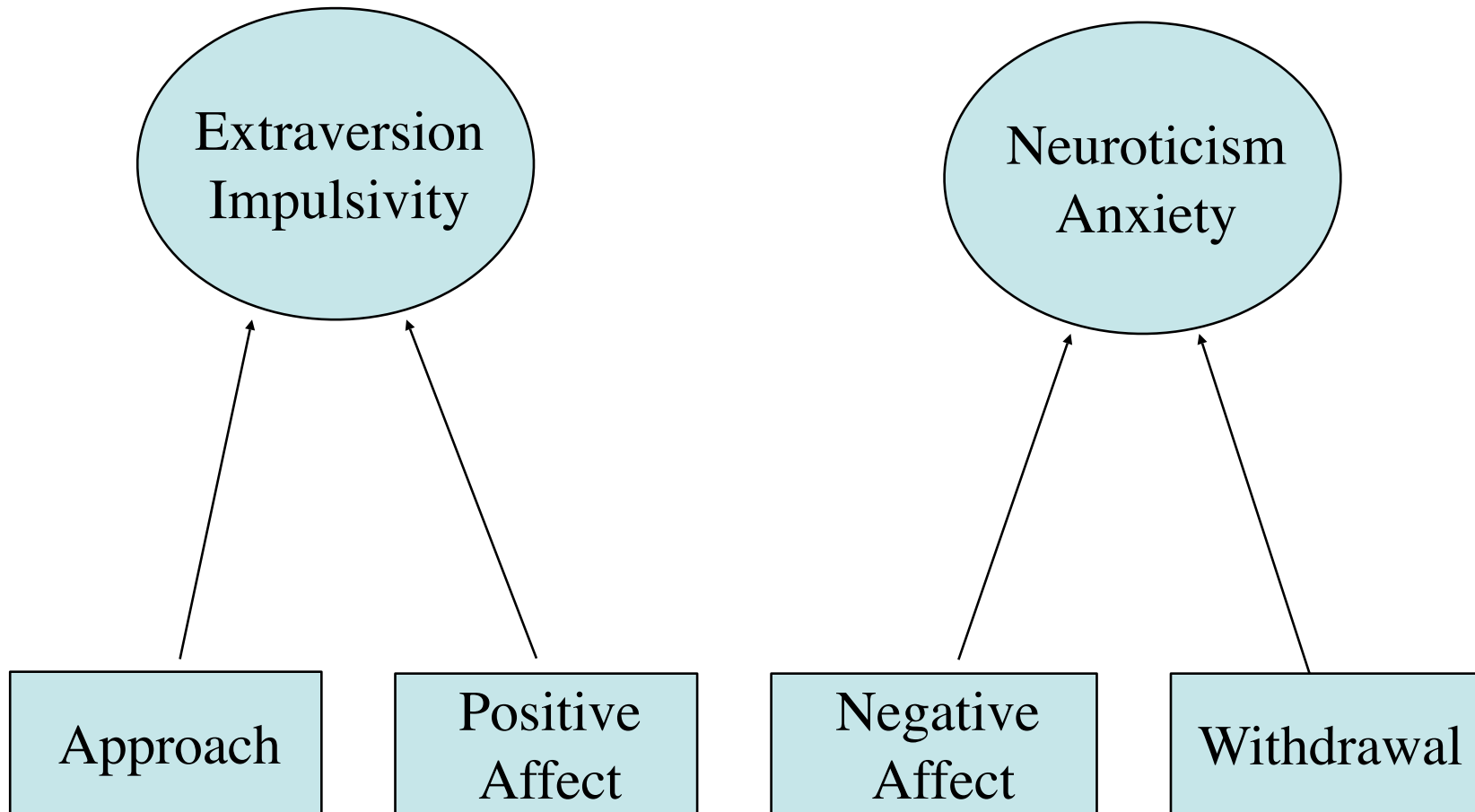


# Traditional Model: Causal factors



# 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	-		+		