

Stress (appraisal) processes in daily life

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**New ideas in conceptualization and measurement of the stress process
ABMR, 2014**

Overview

- A context-process chasm
- Conceptual (context-process) model of chronic stress
- An updated view on the role of perseverative cognitions
- Thoughts on some novel directions in daily stress research
- Measurement implications

A context-process chasm

- Stressor based
 - Event
 - (Appraisal)
 - Acute responses

- Often adaptive

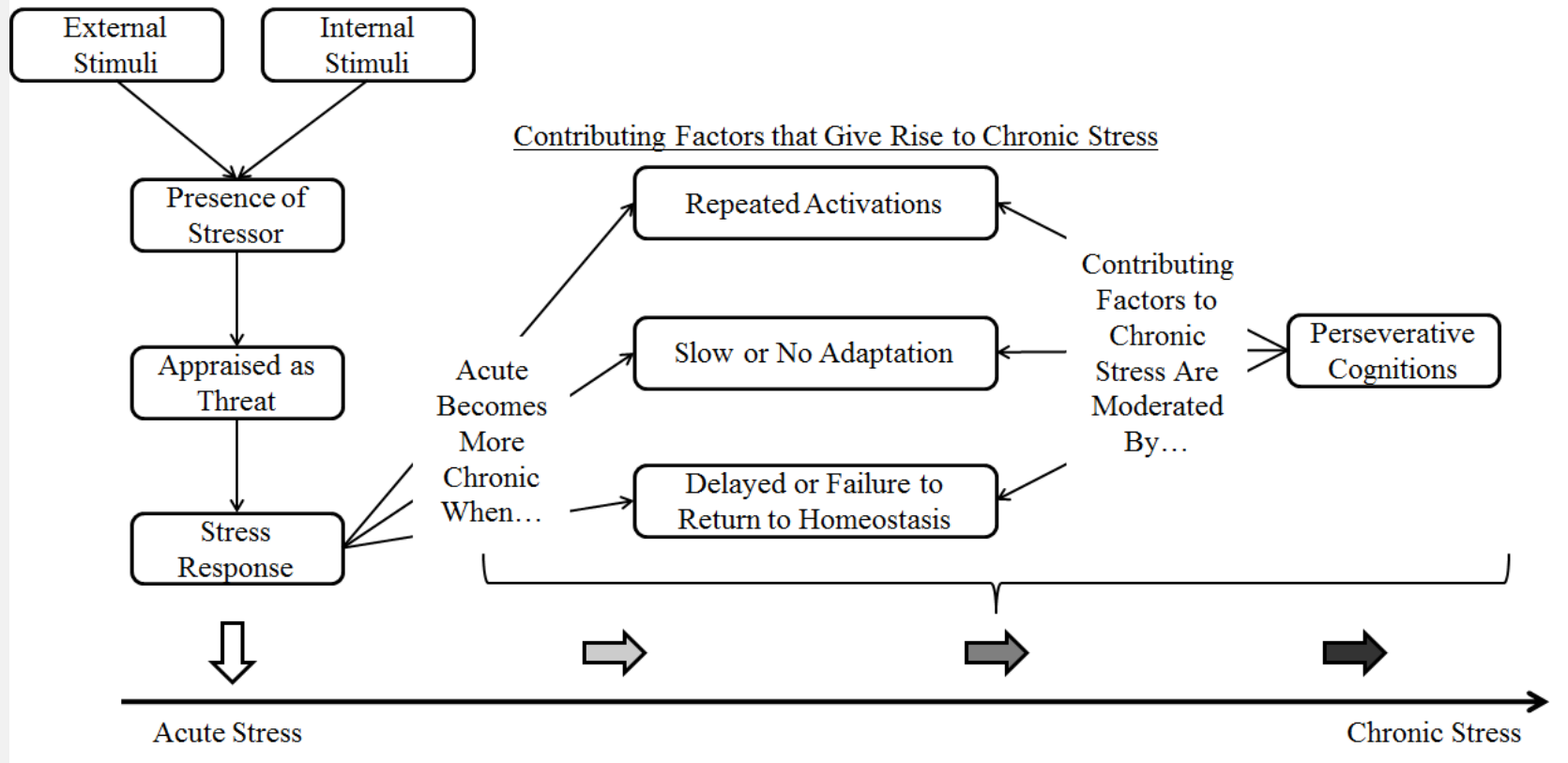


- Outcome based
 - Chronic stress
 - Long-term outcomes

- Often maladaptive

How is the experience of, and immediate reaction to, a stressor transduced into long-term health risks?

Conceptual model



This process unfolds over time, across contexts, and is dynamically recursive

Data capture across time and context in daily life

- What is the 'value added' of daily experience studies (broadly defined) of stress appraisal and regulation?
- Types and categories (EMA, ESM, DD, etc.):
 - Repeated, naturalistic, short(ish) recall
 - Results in intensive longitudinal data [ILD; ImLD]
 - Contents: self report, biomarkers, behavioral data
 - Increasing range of sensors and passive sensing tools
 - Activity, GPS, physiology, etc.
- Within person dynamics, context, and processes

Dynamics, context, and processes

- Response dynamics
 - Duration, peak, recovery, dose [AUC?], interactions/cumulative effects
- Component analysis of daily stress processes
 - Occurrence, ratings, responses
- Cross level modulation (person*context)
 - Amygdala and stress reactivity in daily life
 - More threat reactive in fMRI show greater stress frequency and response severity (rated and cortisol) in daily life
 - Context moderation of this relationship (e.g., momentary perceived social support)

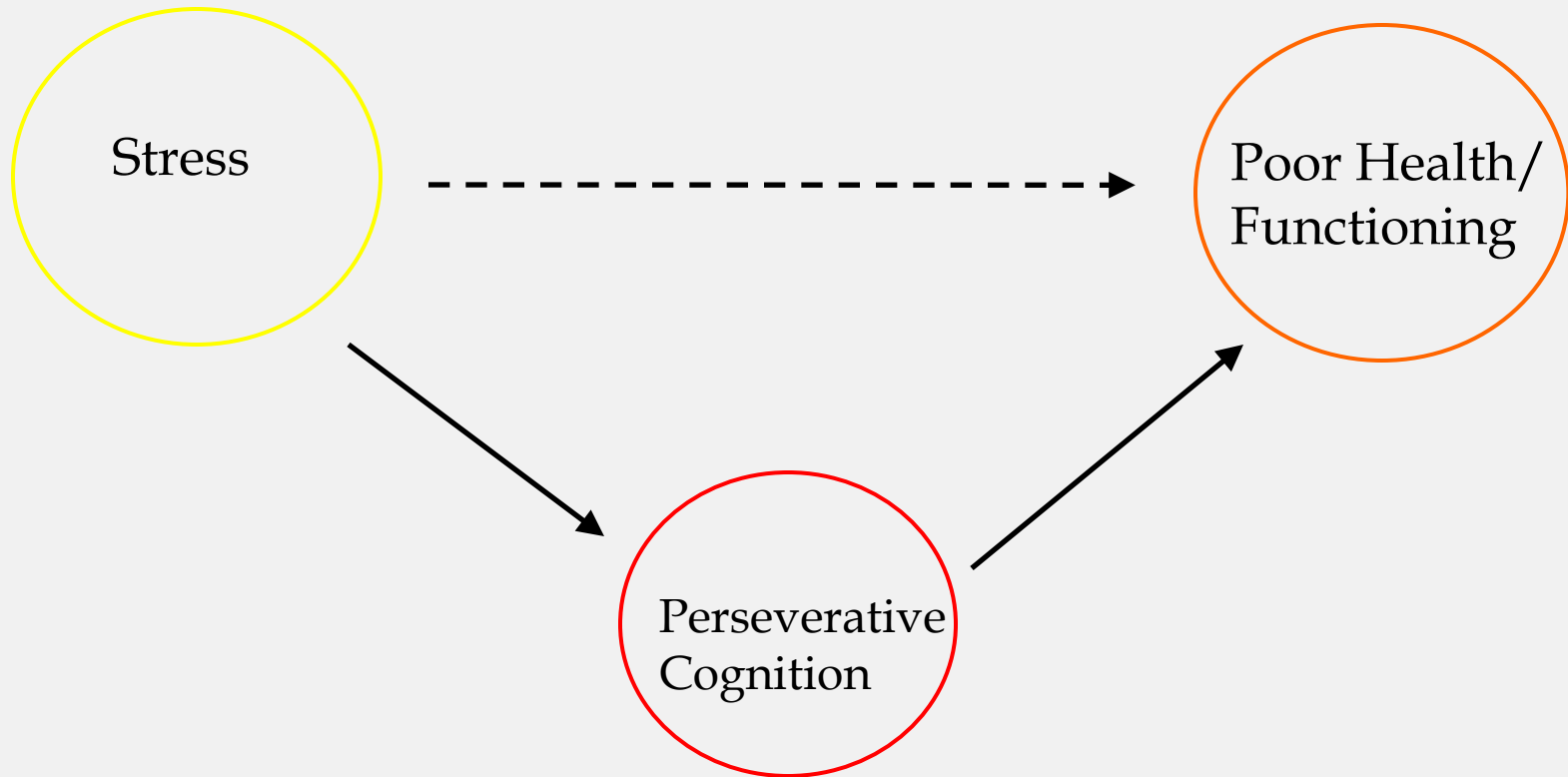
“The mind is its own place and in itself,
can make a Heaven of Hell, a Hell of
Heaven.”

Paradise Lost, John Milton

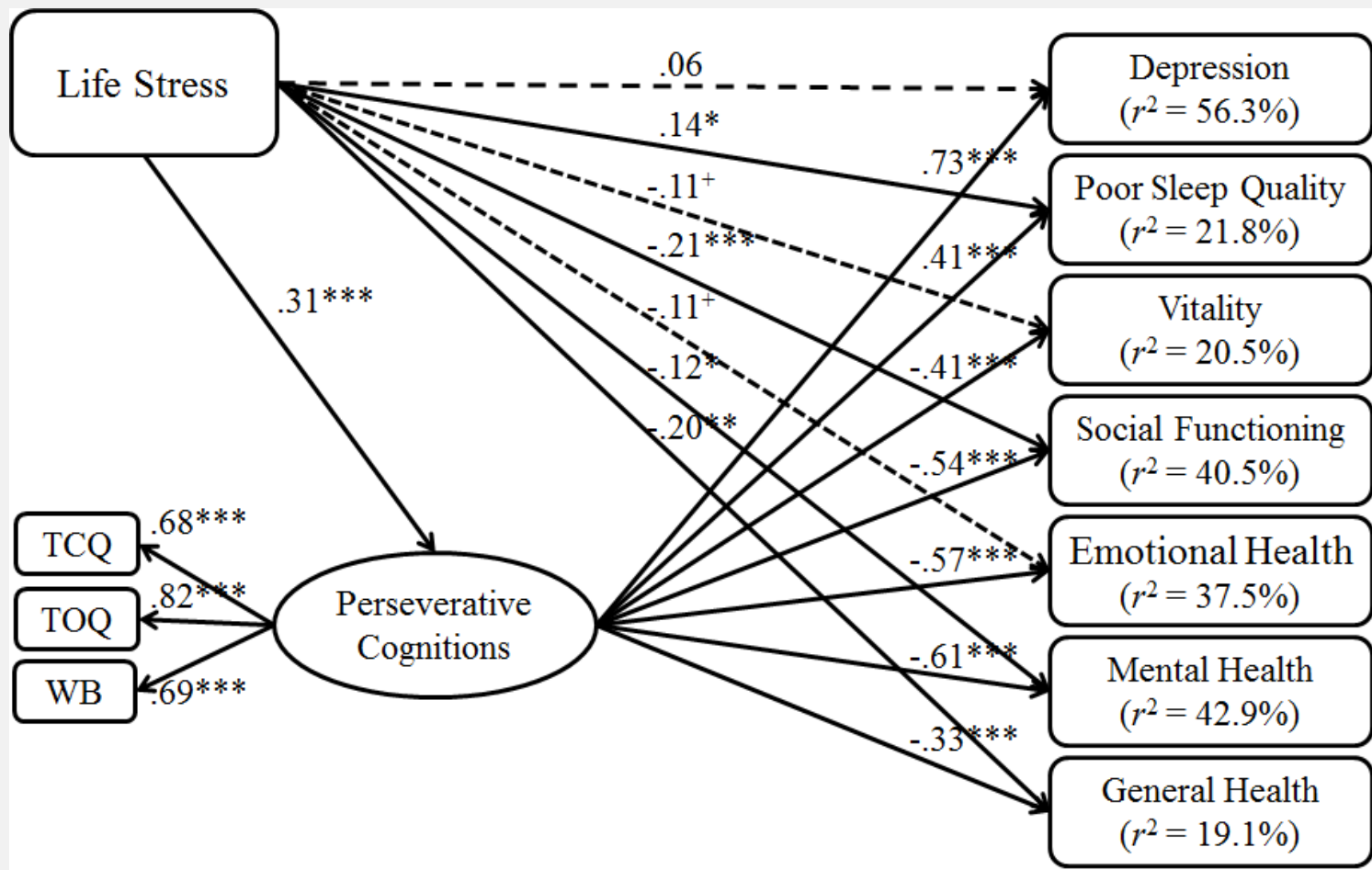
The role of perseverative cognitions

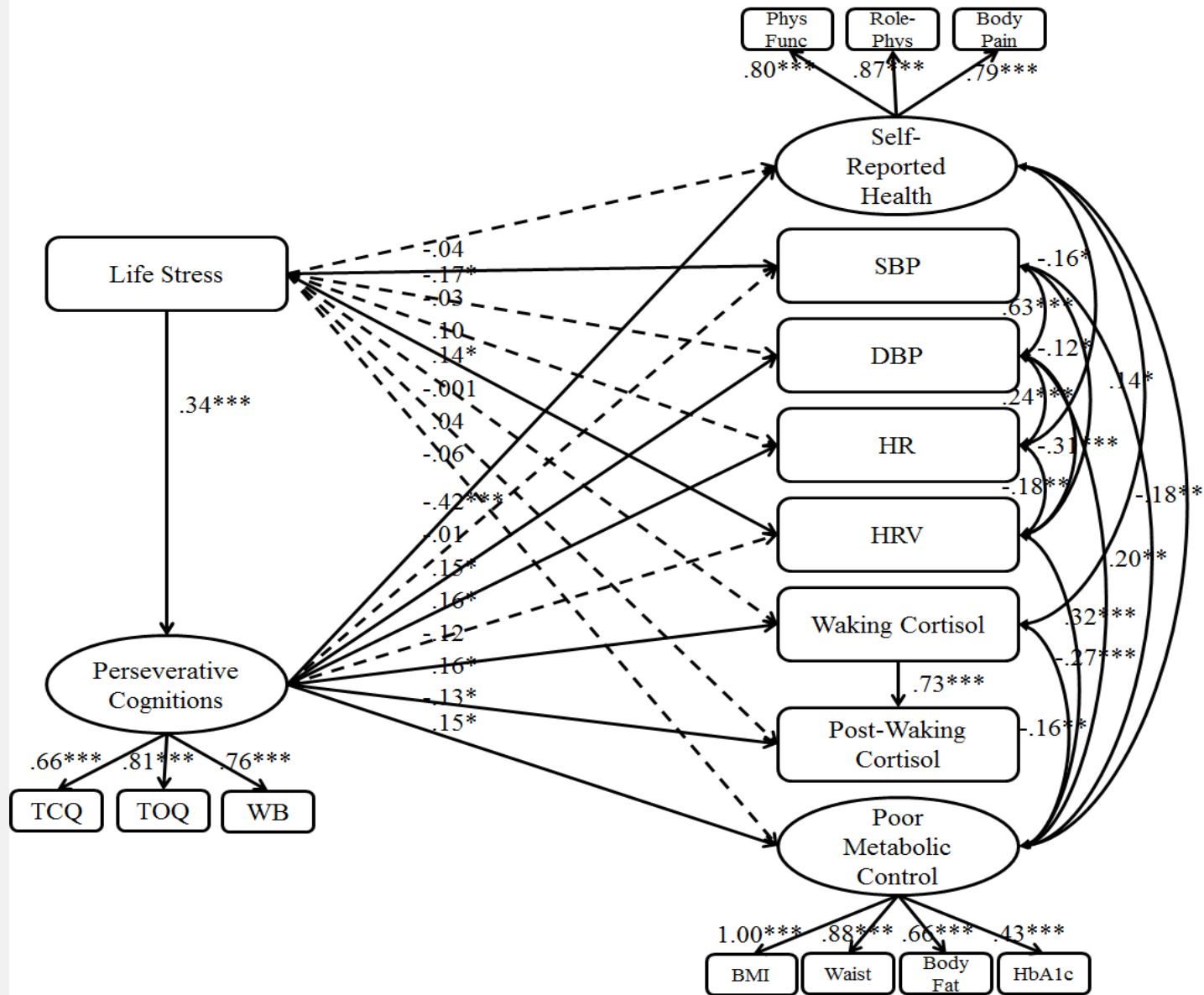
- Repeated and non-productive symbolic representations of stressors
 - Rumination, worry, intrusions, etc.
- Can elicit and sustain stress responses
 - Function as a ('virtual') stressor
 - Increase threat appraisals
 - Prolong activation/impede recovery
 - Decrease coping resources and perceived efficacy
- A common pathway linking stress to poor health?

Stress, perseverative cognition, and health



Can we test this common pathway model between and within persons?

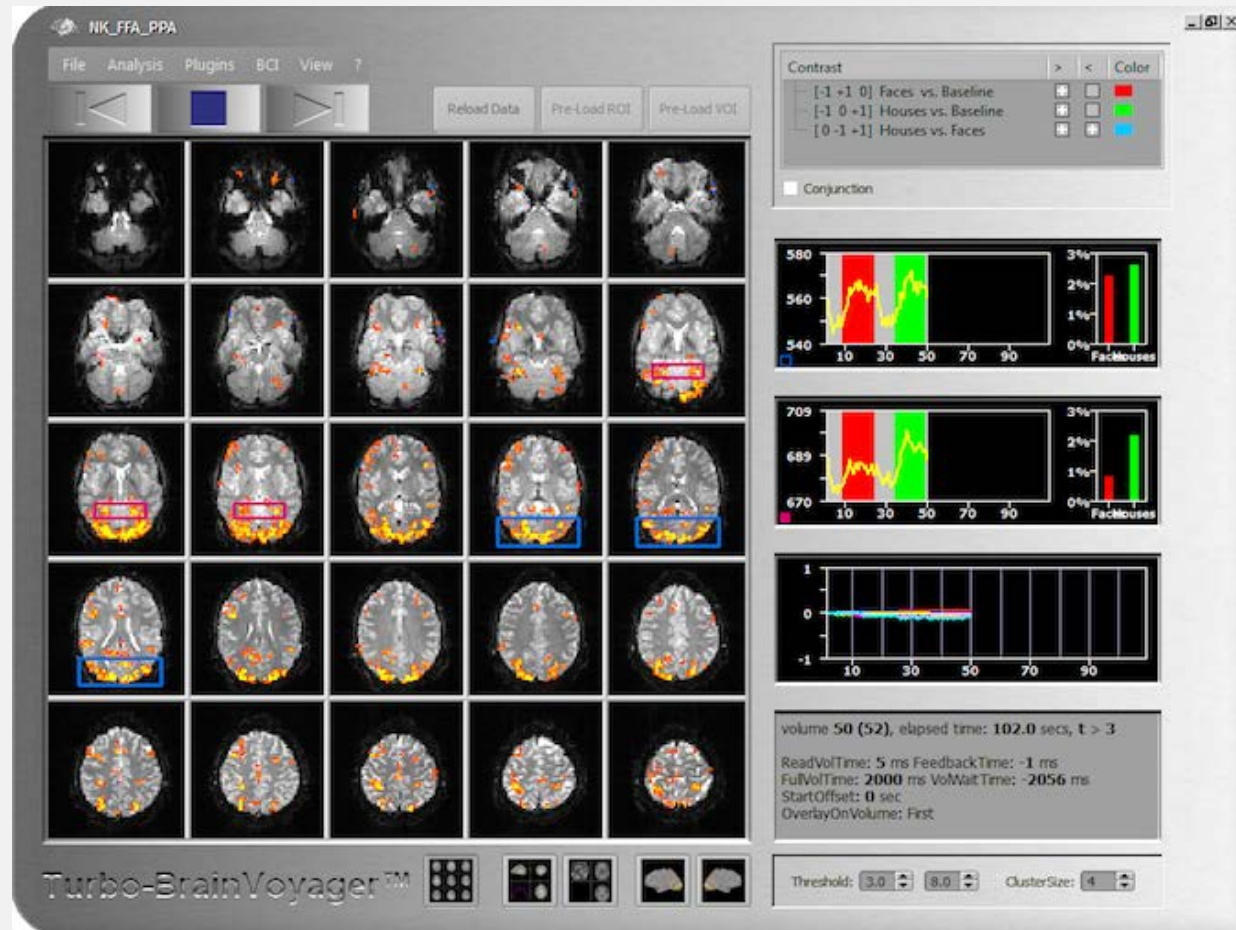




Perseverative cognitions in daily life

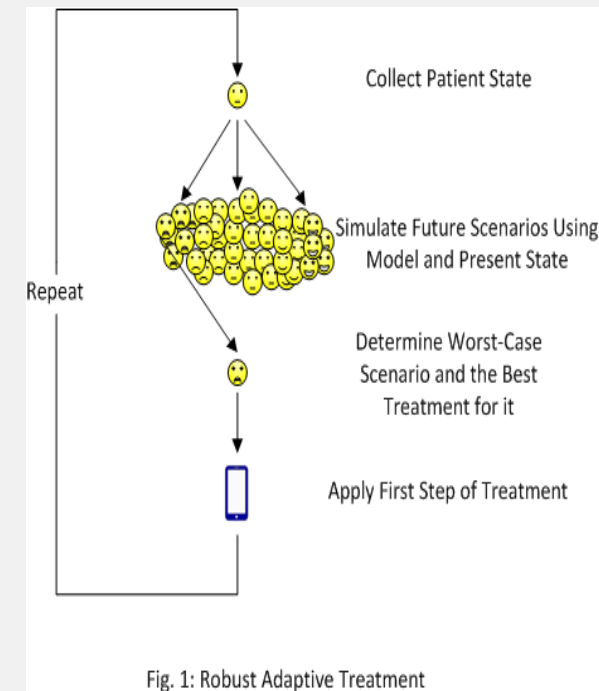
- EMA data in patients with chronic disease
 - Stressful *event* severity
 - Stressful *thought* severity
 - Correlated at $r = .4$
 - Predicted concurrent mood (PA/NA) and activity restrictions due to chronic disease
 - Event and thoughts separately, each predicts all 3
 - Both together – each independently predicts PA & NA
 - Only thoughts predicts activity restrictions
 - Lagged analyses: (T2) 2-3 hours after (T1) event/thought
 - Stress event severity (T1) predicted (T2) better mood and less restriction (recovery?)
 - Thought severity (T1) predicted (T2) worse mood and more restriction

Novel directions in daily stress research: Interventions



Use of context and process measures to inform development and implementation of intervention

- Patients leaving residential treatment for alcohol use disorders
 - GPS alerts
- Can we do something similar with stress?
 - Ideographic risk parameters for stress occurrence and severity
 - Based on physical and social environment, physiology
 - Additional person specific contextual information
 - Provide adaptive stress regulation in real-time
 - Tailored to what that individual needs at that time, in that location, for that stressor



Measurement implications

- “Mind the gap” and consider the need for context and/or process measures
 - Notably for within person questions
- Where needed, use ImLD approaches
 - Device-based EMA, daily diary where possible (e.g., NESP, MIDUS, NSDE, others)
 - Simpler and less burdensome approaches also exist (e.g., SMS based, mining existing data [FB, twitter], recommendation models, etc.)
- Assess perseverative cognitions/thoughts

Thank you

Thus it is that foresight, the greatest blessing humanity has been given, is transformed into a curse. Wild animals run from the dangers they actually see, and once they have escaped them worry no more. We however are tormented alike by what is past and what is to come. A number of our blessings do us harm, for memory brings back the agony of fear while foresight brings it on prematurely. No one confines his unhappiness to the present.

Seneca, Letter V from “Letters from a Stoic,”
(0064 CE)

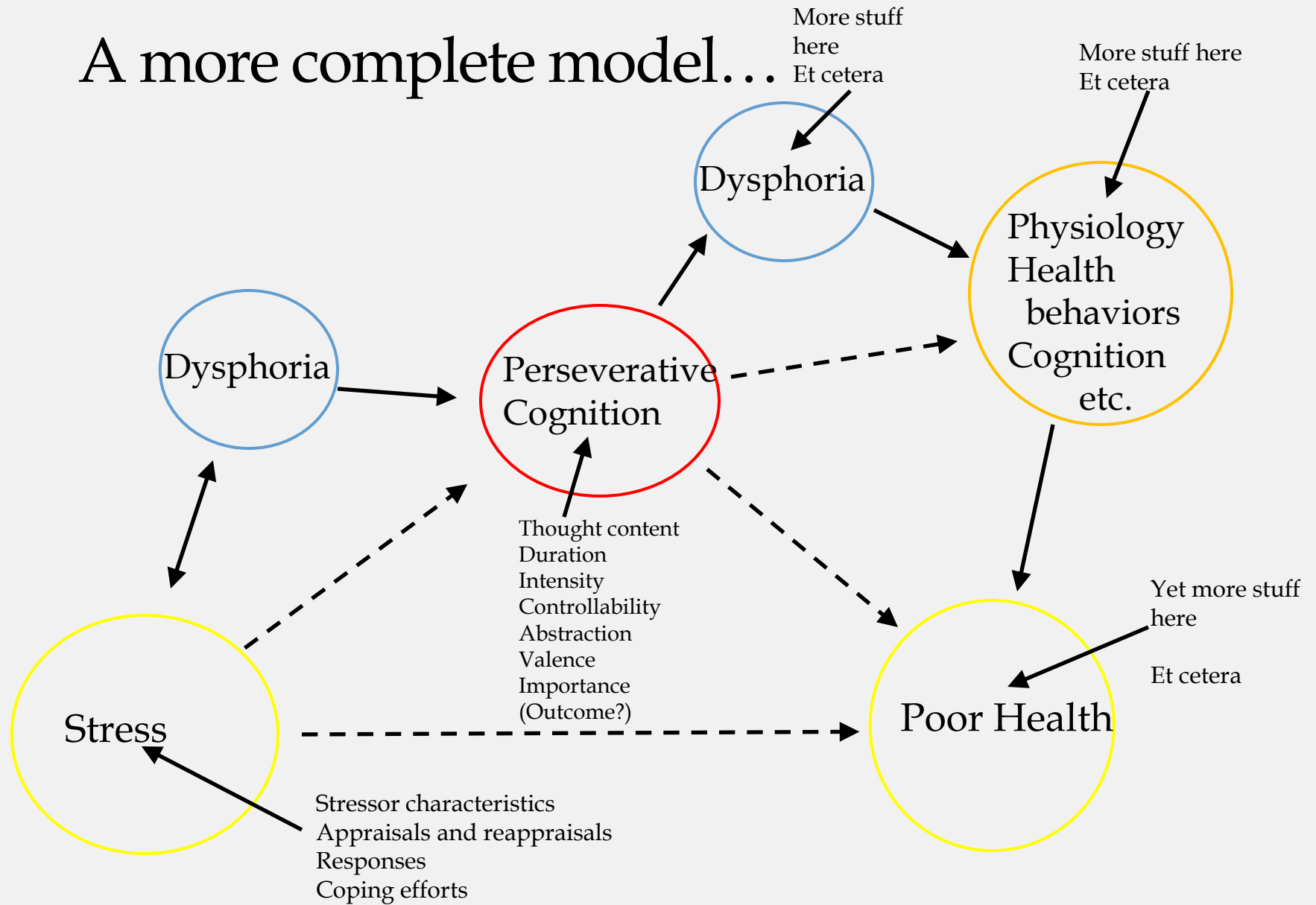
Unpacking stress

- Using these methods to measure stress as a process in context, what might we be interested in?
 - Stressor
 - Type/content? Duration? Predictability? Source?
 - Appraisal (re-, etc.)
 - Threat/challenge? Importance? Resources? Control?
 - Response
 - Biomarkers/physiology? Affective? Behavioral? Cognitive?
 - Coping
 - Specific coping efforts? Matching? Type? Effectiveness?
 - Context
 - Where, who, (why?), etc.
 - Time
 - Possibly on several aspects?

Unpacking perseverative cognition

- To measure perseverative cognition, what might we be interested in?
 - Thoughts/cognitions
 - Type/content? Duration? Predictability? Intensity? Controllability? Abstraction? Accuracy?
 - Valence and tone
 - Positive/negative? Importance? Variability/lability?
 - (Outcome?)
 - “Maladaptive” – the last refuge of the desperate
 - (Those out of awareness?)
 - Et cetera

A more complete model...



Temporal resolution













- All of this is nested in different time frames
 - These are within-person processes
- Some processes may occur in moments
 - Initial appraisals and responses to stressors
 - Experiential and other aspects of a single perseverative moment
 - Et cetera
- Other processes may occur over much longer time frames
 - The “chronic” in chronic stress
 - Repetitive and ruminative aspects of perseverative cognition
 - Health risks, morbidity, mortality
 - Et cetera

Meta characteristics

- Haven't touched upon potential synergies between these various elements
 - Are “blends” of perseverative cognitions protective and/or toxic?
 - How do parallel streams of stress-rumination interact with one another, or do they exist independently?
 - Do different temporal features (e.g., amplitude, frequency, variability, etc.) lead to different outcomes?

Dynamic processes

- More sophisticated approach is to fit a within person model
 - Conceptually similar to a multi-level model
 - Ideally one that updates in (near?) real-time as data accrue
 - Accounting for...
 - Possible triggers, DoW, time, location, other people, etc.
 - This also allows person-specific triggers and relationships
 - Intervene based on deviations from what is “expected” for that moment and context

| | @Work | Spouse | Child | Friday eve | Eating |
|--------|---|--|---|---|---|
| Robert |  |  | |  |  |
| Mary |   | |  |  |  |
| Pat |  | | |  |  |