

Persons in Contexts: Idiographic Psychological Dynamics

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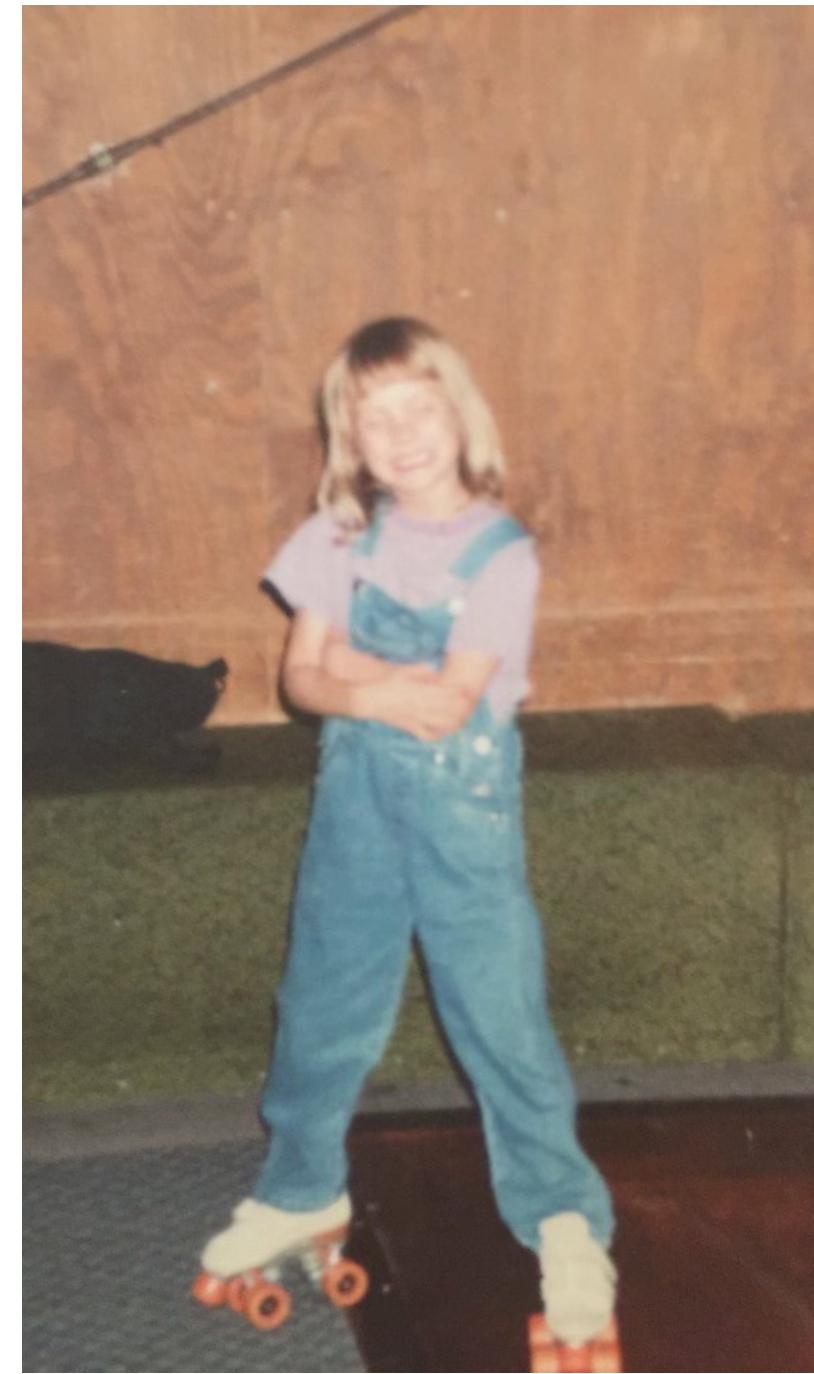


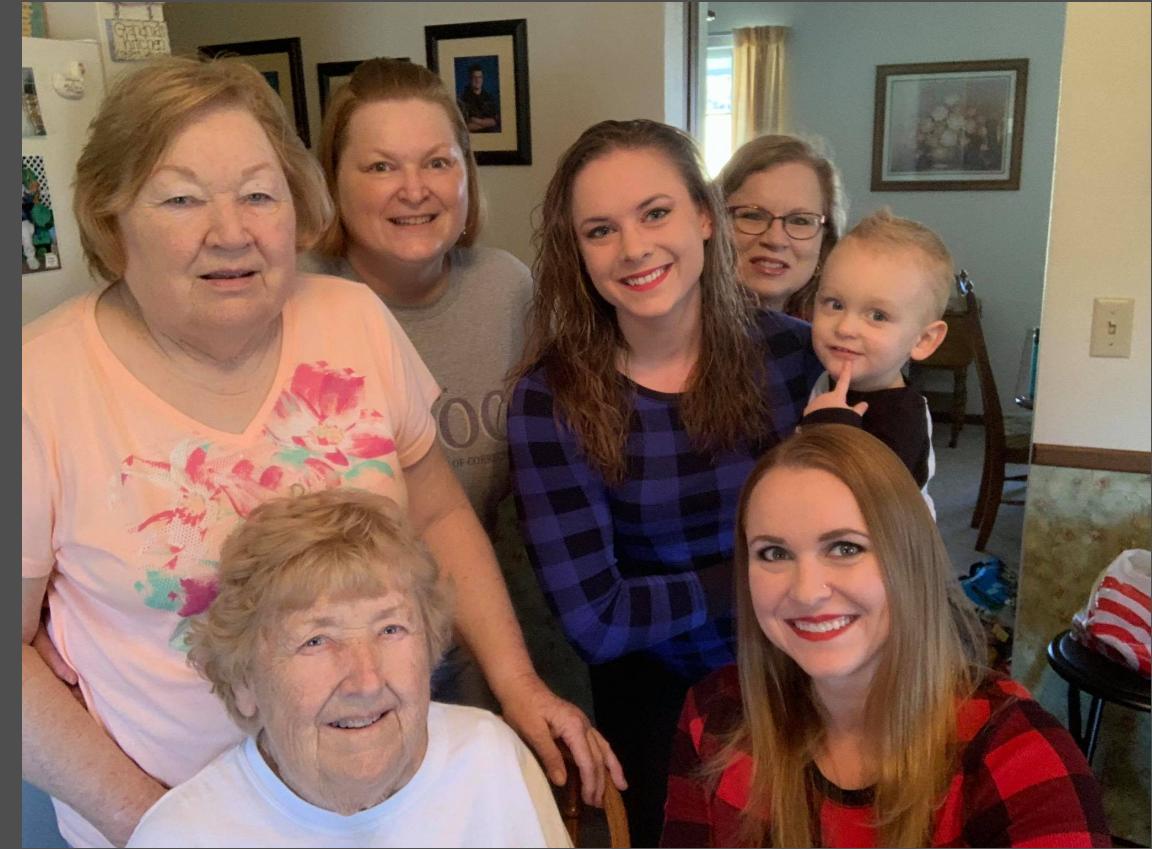




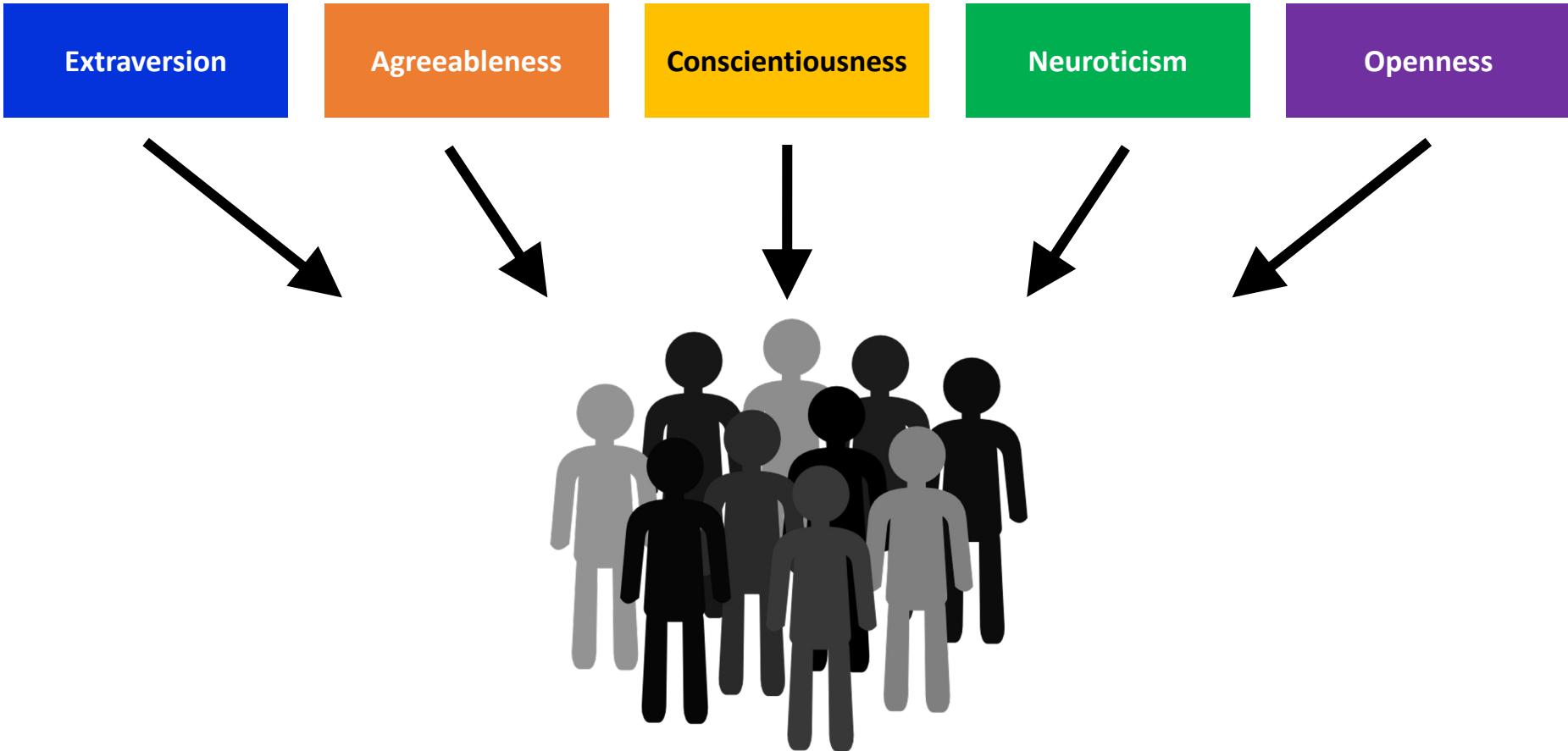








What is personality?

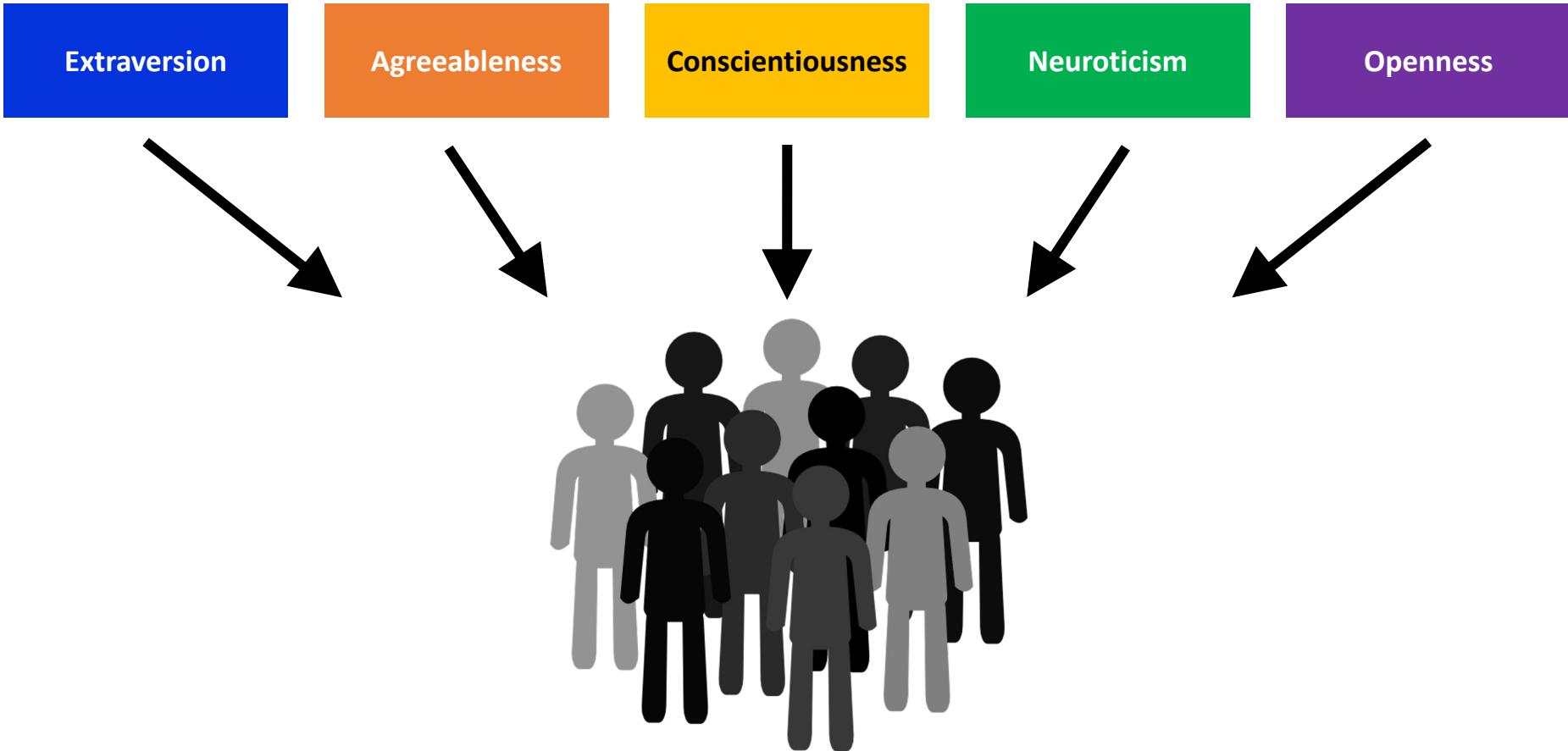


Nomothetic
Between-Person
Variable Centered

What is personality?

Personality is what personality tests test.

(Jack Wright, personal communication, 2013)



Nomothetic
Between-Person
Variable Centered

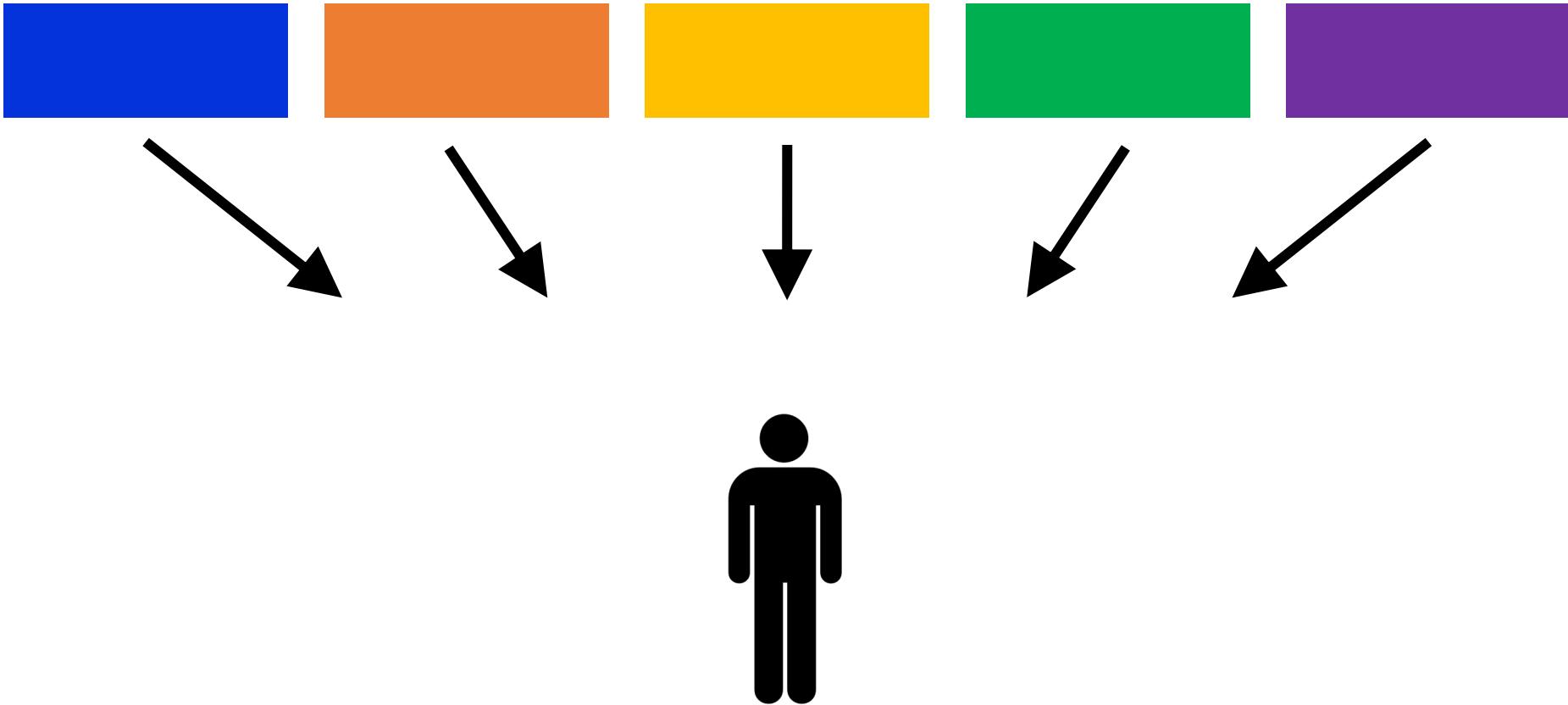
What is personality?

“Personality is the **dynamic organization** within the individual of those **psychophysical systems** that determine his **unique adjustments to the environment**.”



(Allport, 1937, p. 32)

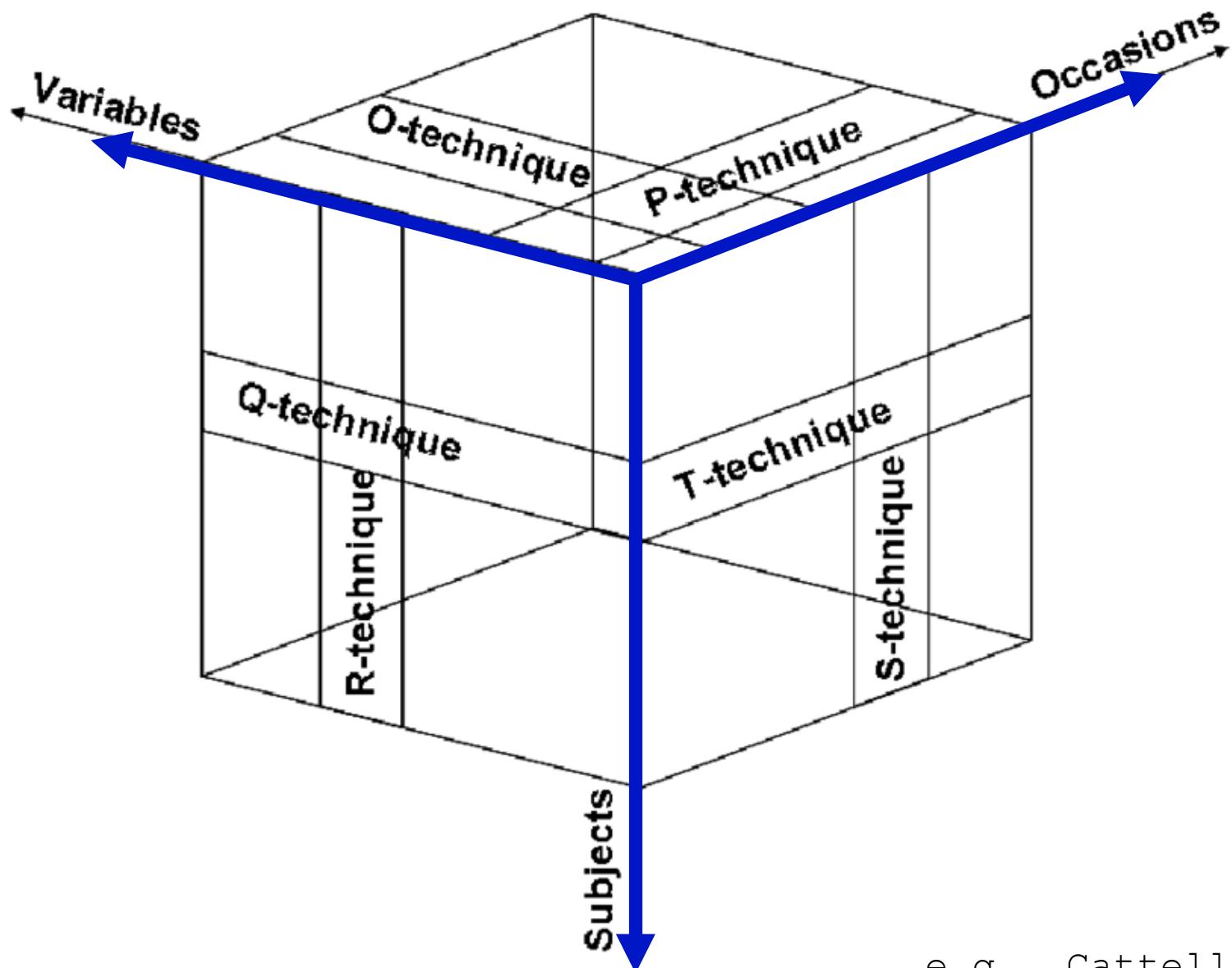
e.g., Allport, 1937, 1961, 1968



**Idiographic
Person-Centered**

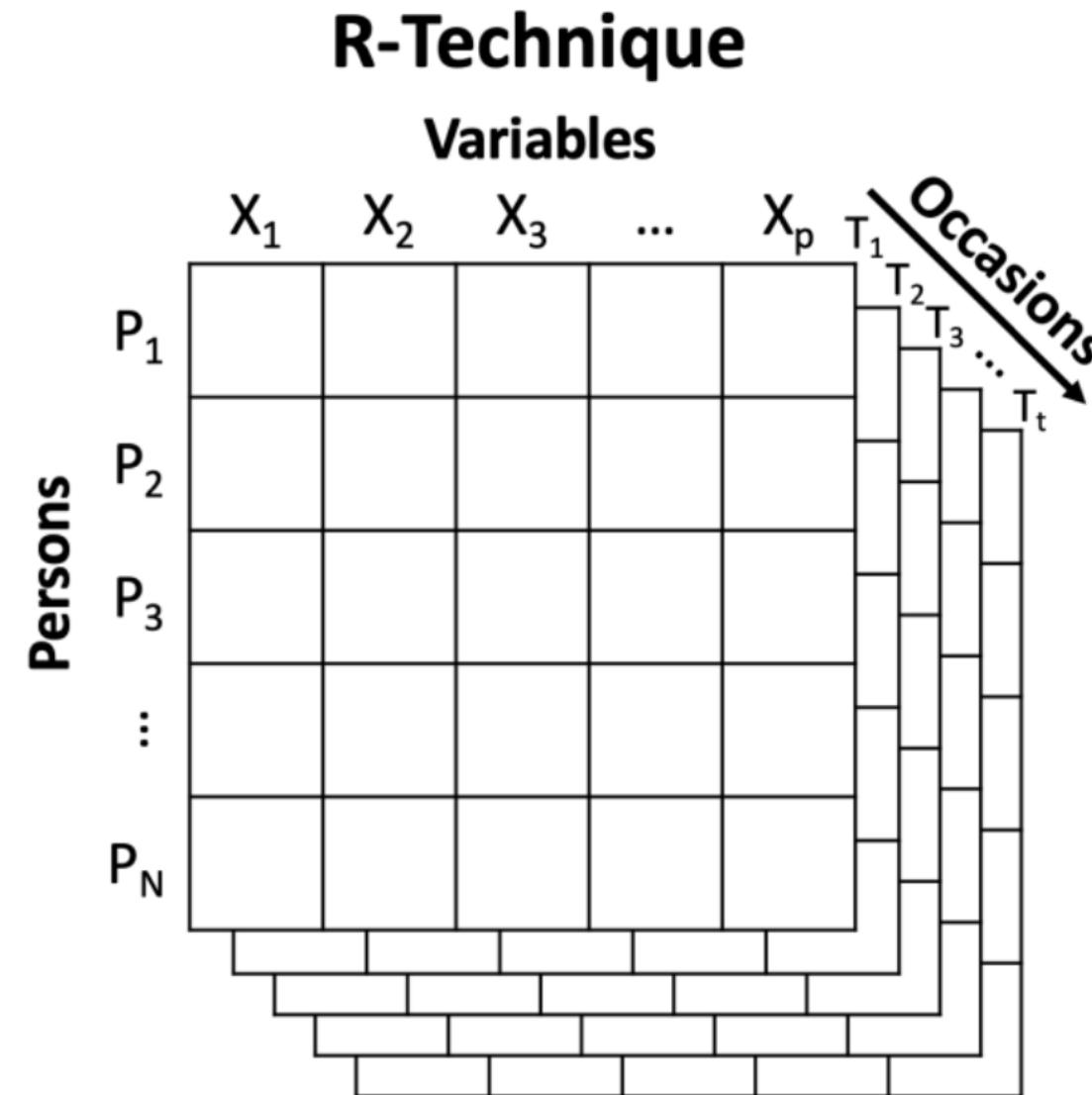


What is personality?



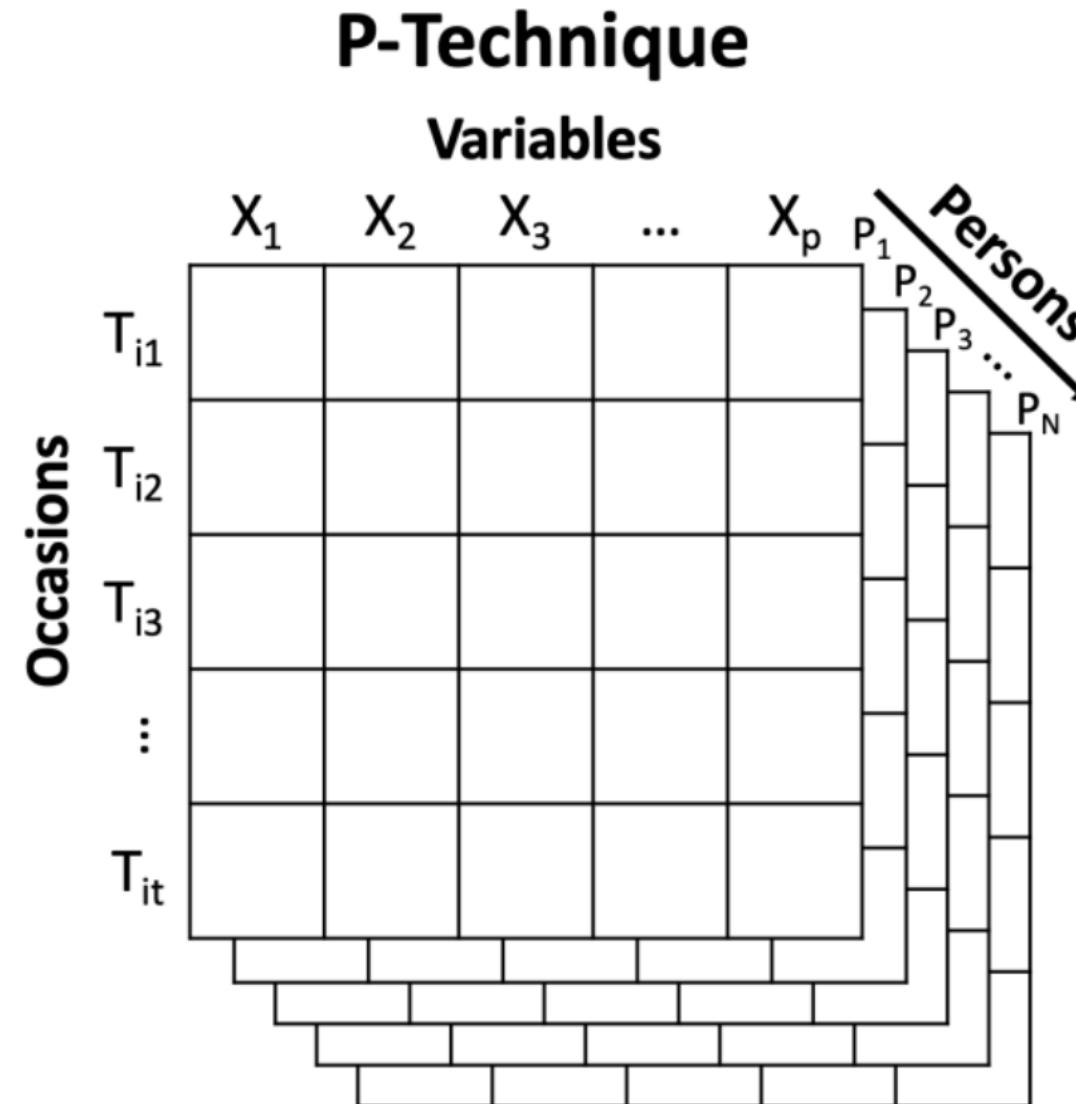
e.g., Cattell, 1943, 1946, 1957

What is personality?



e.g., Cattell, 1943, 1946, 1957

What is personality?



e.g., Cattell, 1943, 1946, 1957



What is personality?



if

...

then

Context

Situation perception

Experience

Etc.

Behavior

Experience

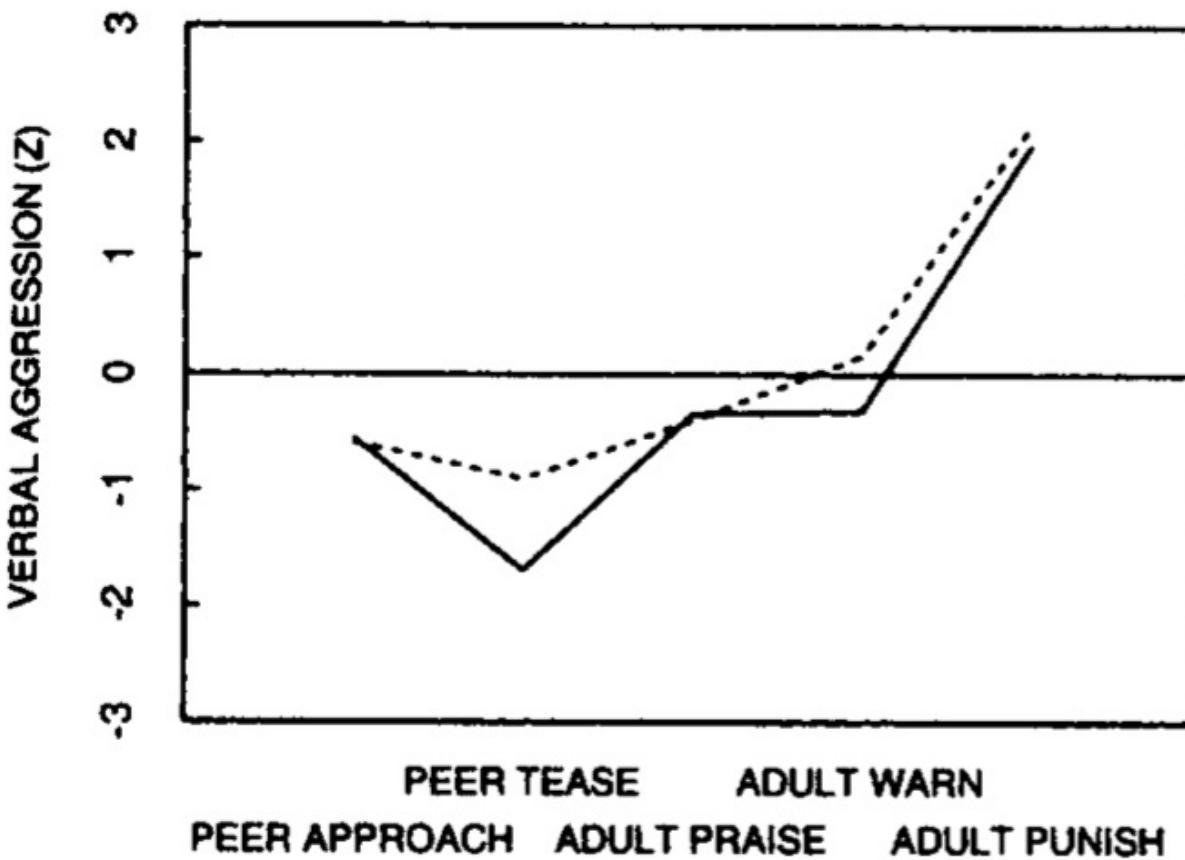
Etc.

e.g., Mischel & Shoda, 2005; Wright & Mischel, 1987;
Shoda, Mischel, & Wright, 1993; Mischel, 1973



What is personality?

Child # 17 profile stability: $r = 0.96$



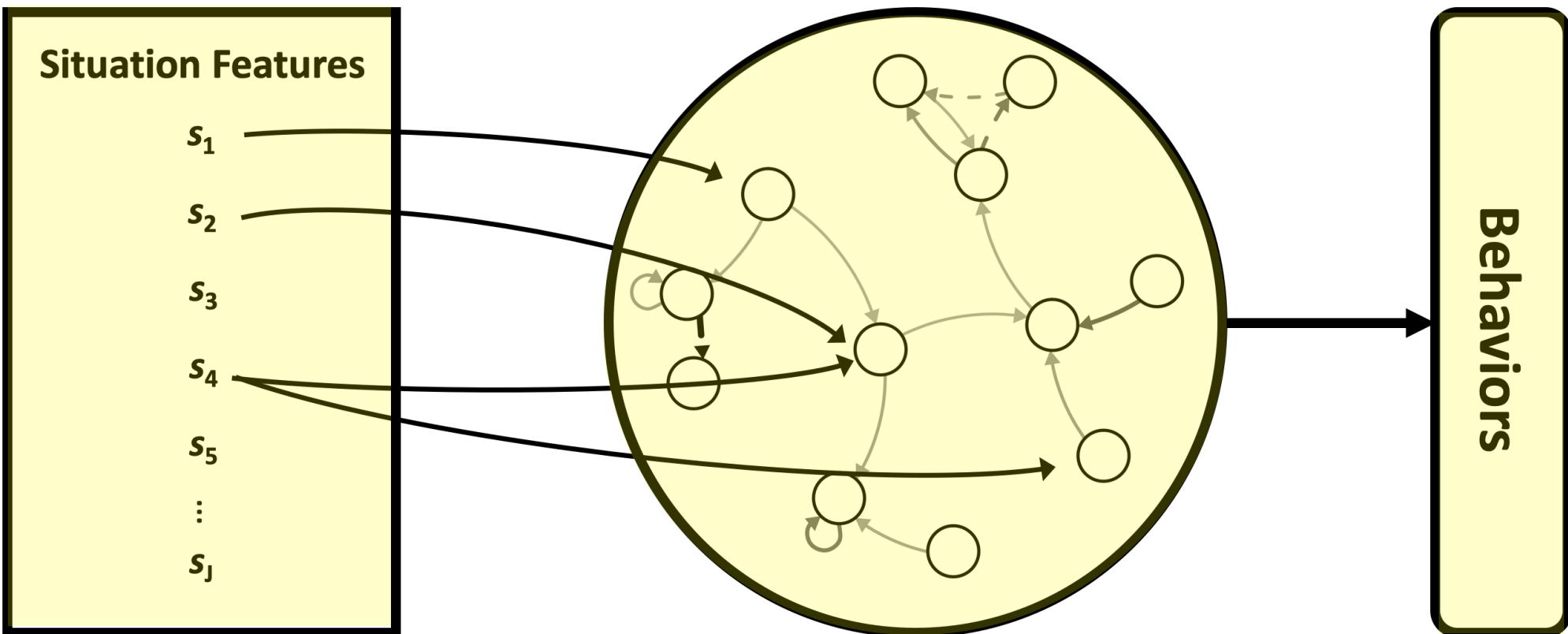
e.g., Mischel & Shoda, 2005; Wright & Mischel, 1987;
Shoda, Mischel, & Wright, 1993; Mischel, 1973



What is personality?



A Cognitive Affective Processing System (CAPS)



e.g., Mischel & Shoda, 2005; Wright & Mischel, 1987;
Shoda, Mischel, & Wright, 1993; Mischel, 1973

What is personality?

Personality is what personality tests test.

(Jack Wright, personal communication, 2013)

Individuals
(idiographic)

Contexts

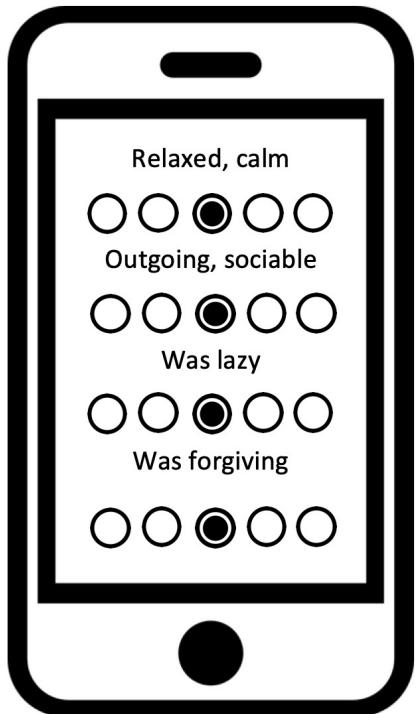
Dynamics & Systems

Basic Surveys



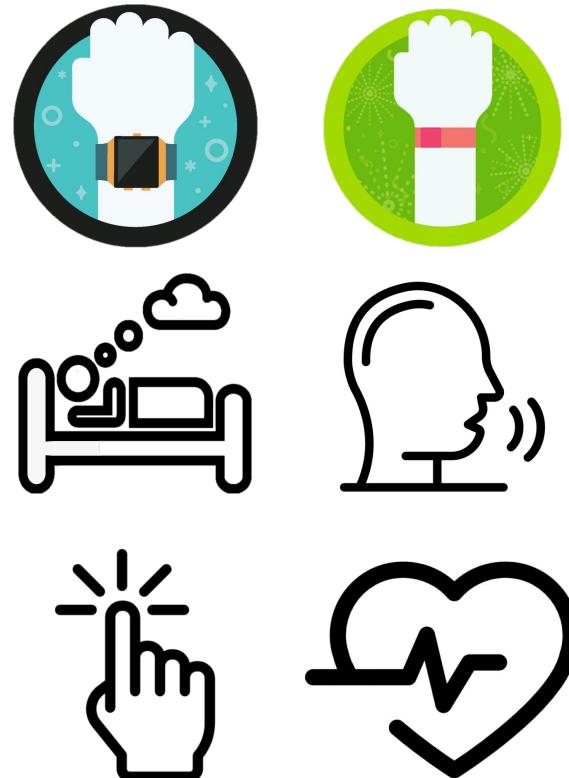
e.g., Beck &
Jackson, 2021c, *JPSP*

ESM / EMA



e.g., Beck &
Jackson, 2020a, *JPSP*

Mobile Sensing



e.g., Beck &
Jackson, revision
submitted, *Psych Sci*

Open-Ended Responses



e.g., Beck &
Jackson, 2021d, *EJP*

Time Series Analysis

(Beck & Jackson, 2020a, *JPSP*)

Machine Learning

(Beck & Jackson, rev, *Psy Sci*)

Structural Equation Modeling

(Jackson & Beck, 2021, *JG:SB*)

Network Approaches

(Beck et al., 2021, *EJP*)

Specification Curve Analysis

(Beck & Jackson, 2021a, *JPSP*)

Multilevel Modeling

(Bollich, Beck, et al., 2021, *JPSP*)

Bayesian Modeling

(Beck & Jackson, 2021b, *EJP*)

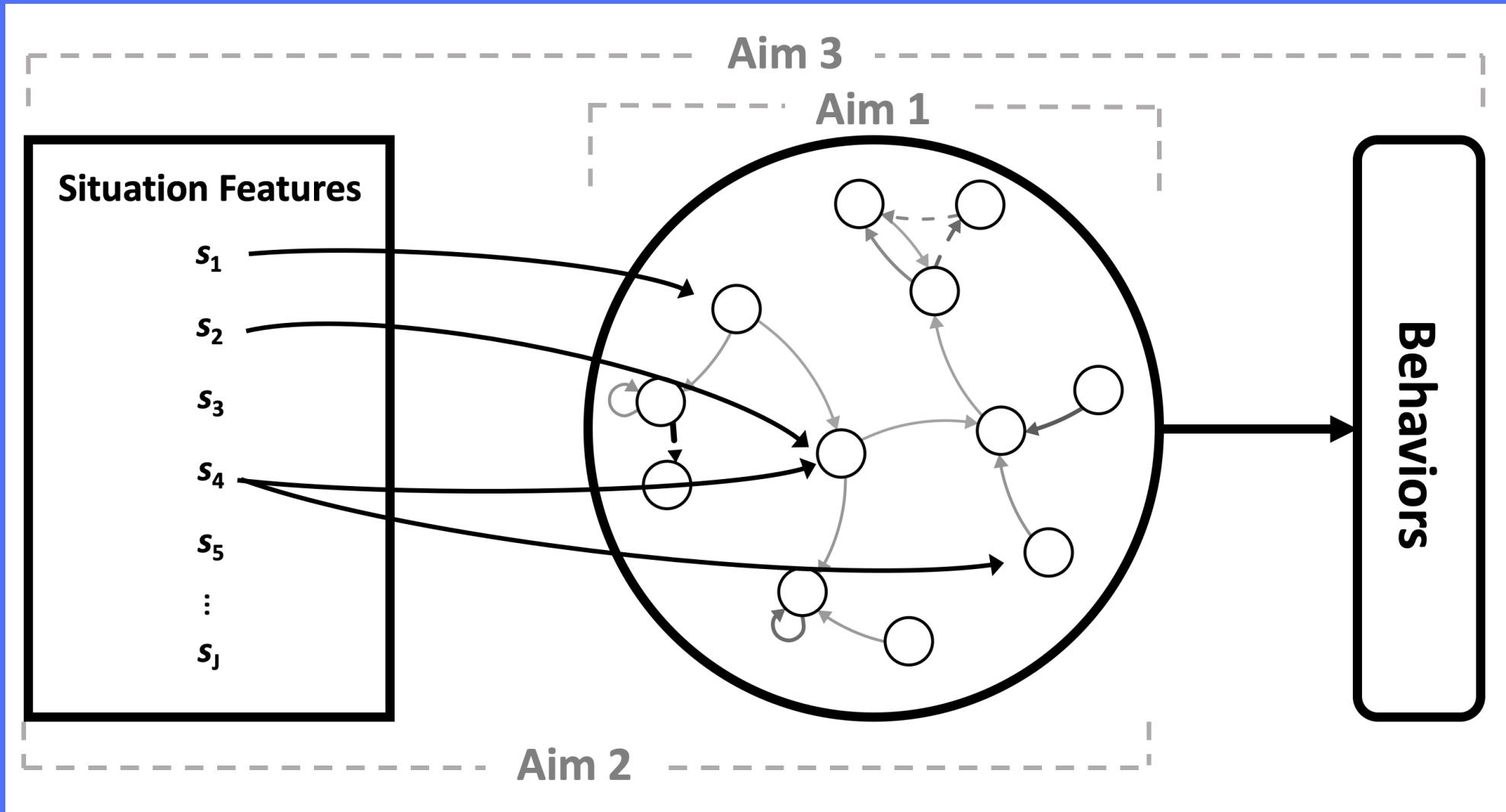
Integrated Data Analysis

(Beck & Jackson, 2021a, *JPSP*)

Permutation Approaches

(Beck & Jackson, 2021c, *JPA*)





* = shared first
authorship.

Aim 1: Bringing the individual back in the study of personality structure and change.

Beck & Jackson
(2020, *JPSP*; 2021b; *EJP*)

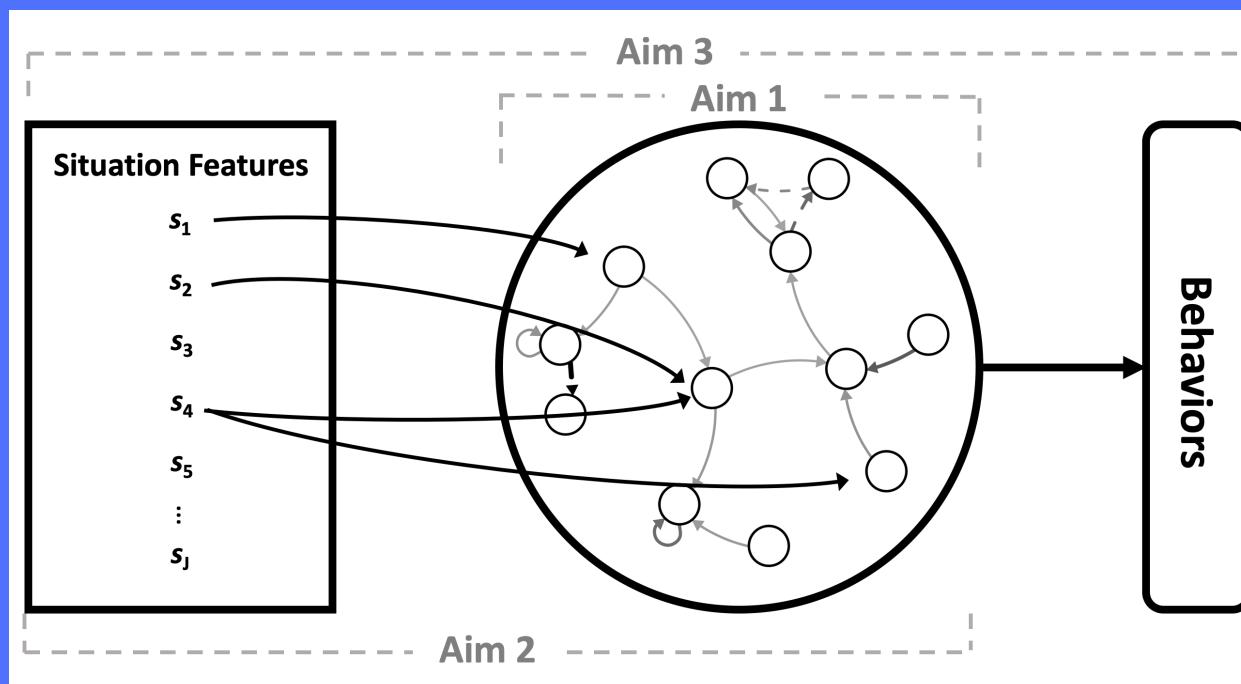
Aim 2: Using longitudinal data to understand how well-being unfolds across contexts.

*Cheung, *Beck, et al.
(under review)

Aim 3: Predicting behavior using machine learning.

Beck & Jackson
(revision submitted, *Psych Science*)

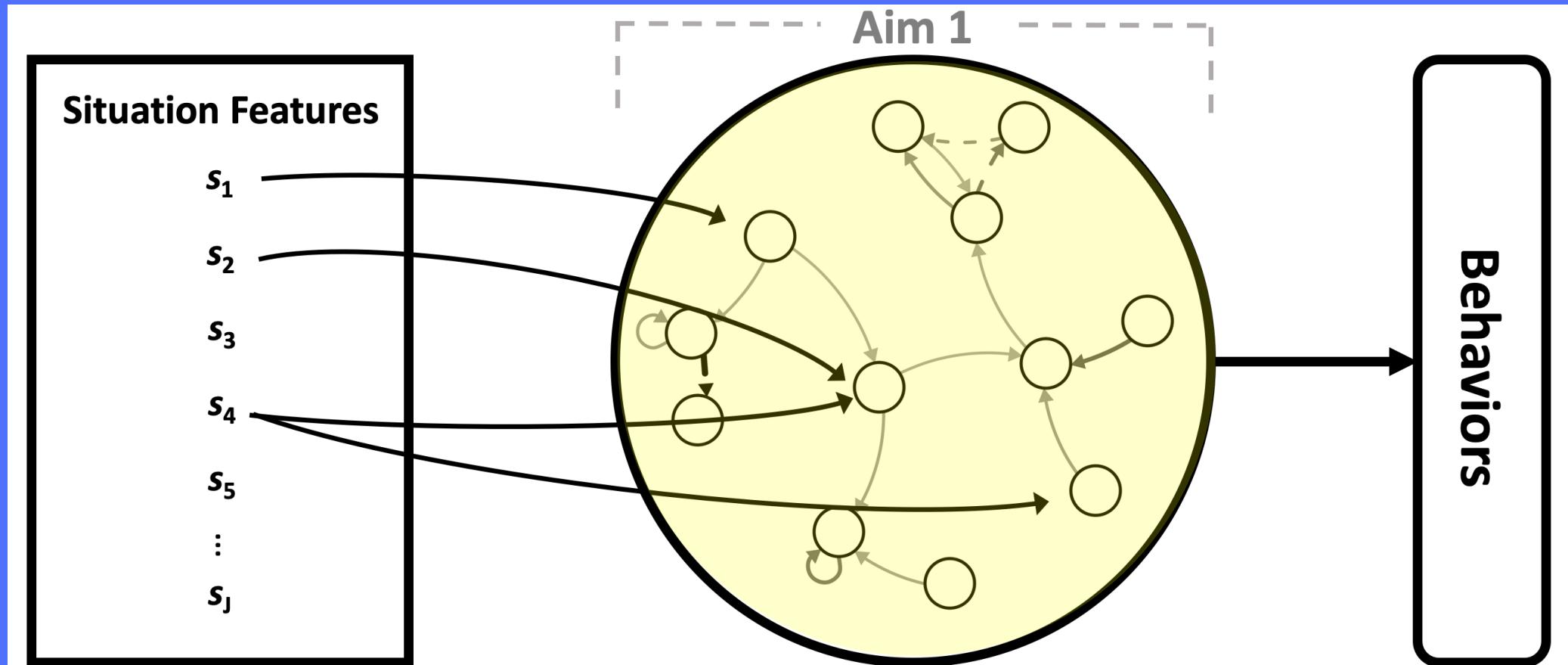
Future Directions

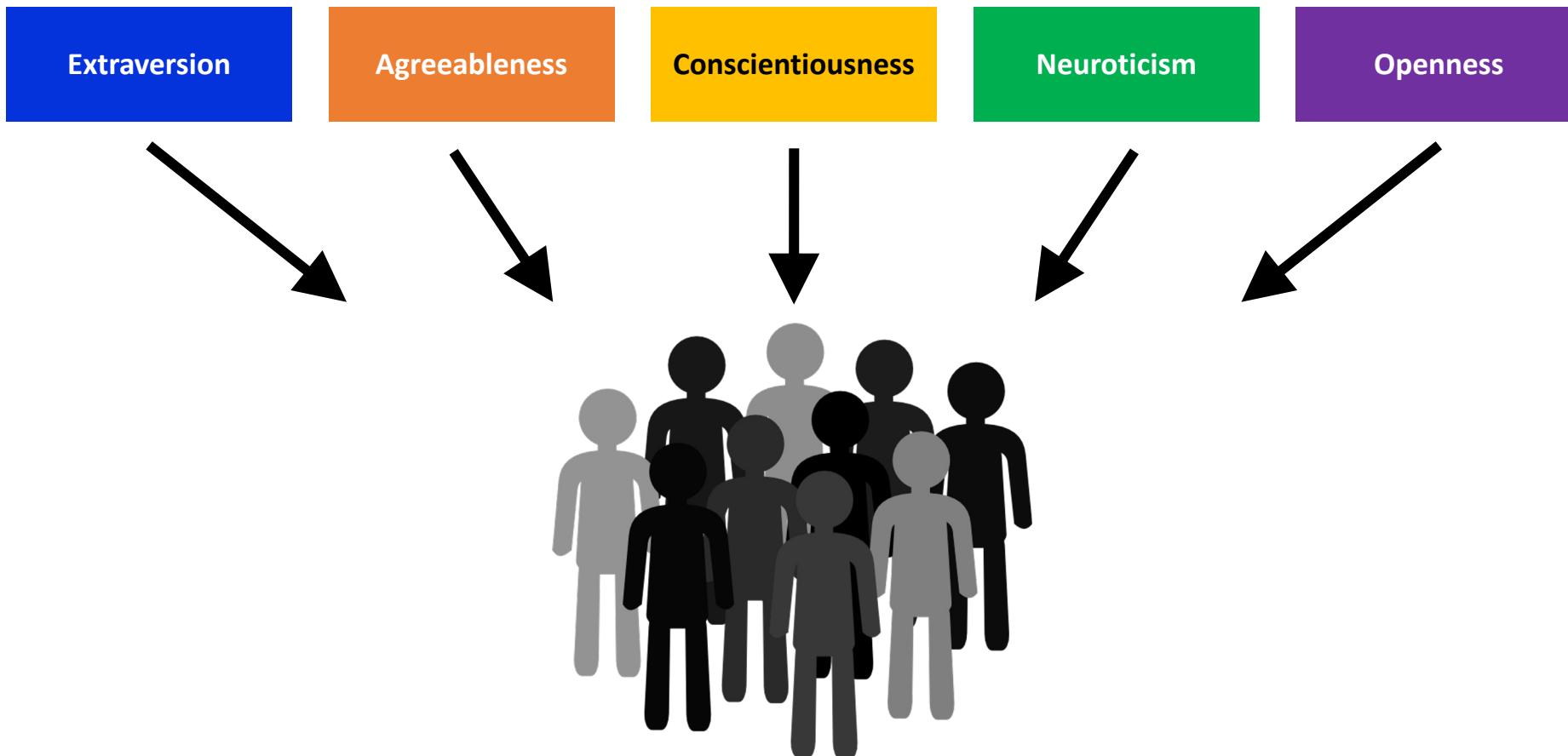


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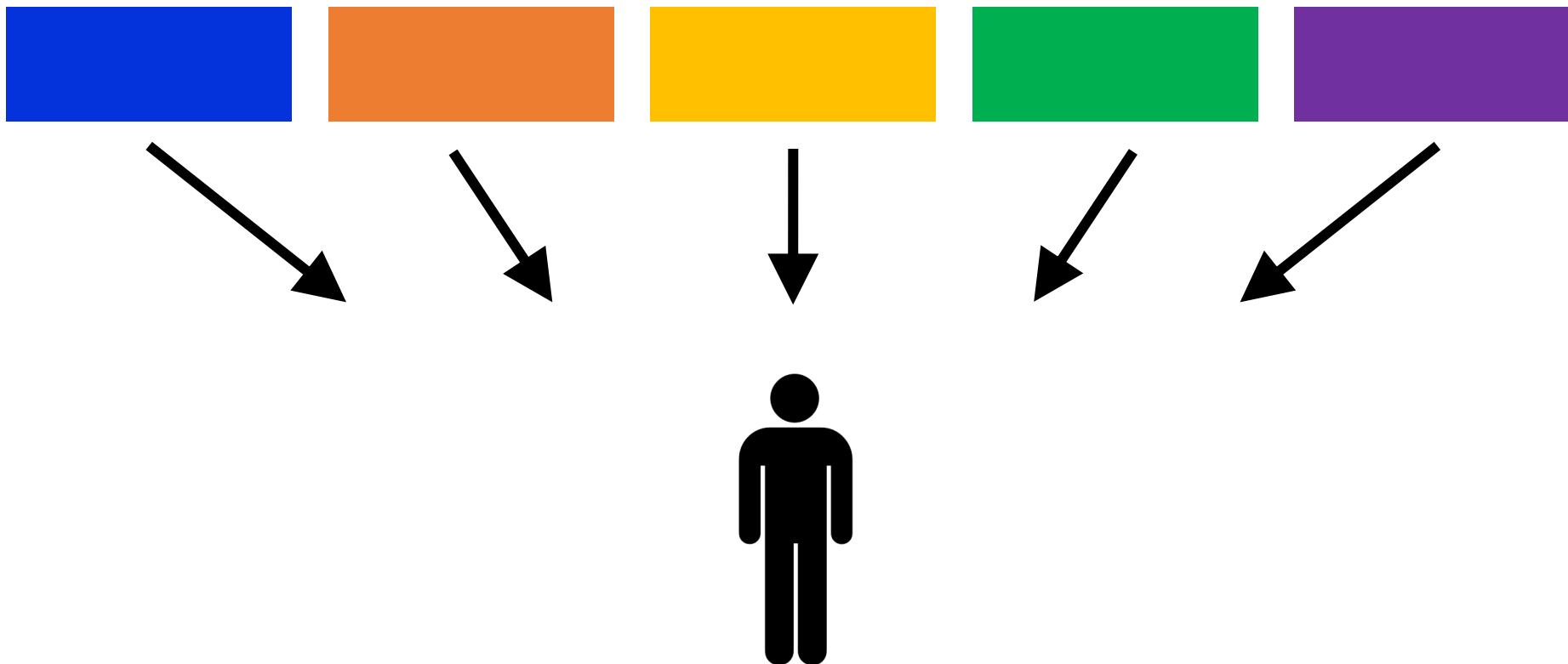
Aim 1: Bringing the individual back in the study of personality structure and change.

Beck & Jackson
(2020, *JPSP*; 2021b; *EJP*)





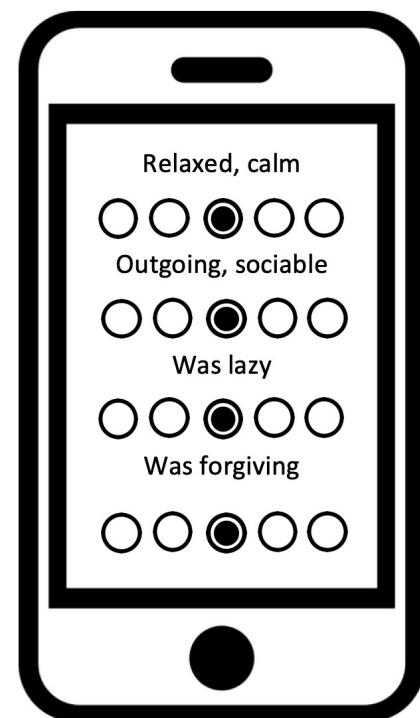
**Between-Person
Variable Centered**



**Idiographic
Person-Centered**

ESM / EMA

Mobile Sensing



Methods

2 years of ESM responses from the Personality and Interpersonal Roles Study (PAIRS)

N = 372 Wash U undergrads, total assessments N = 17,715

Measures

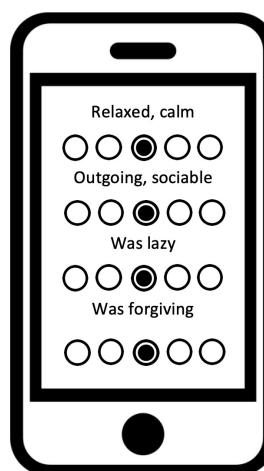
9 items from the Big Five Inventory (BFI)

Procedure

4 assessments / day for 15 days

Modeling

Graphical vector autoregression





time

E A C N O

1
2
3
4
5
6
7
8
9
10
11

E A C N O

E				
A	0.02			
C	-0.05	0.08		
N	0.64	-0.12	-0.10	
O	0.26	-0.27	0.43	0.07

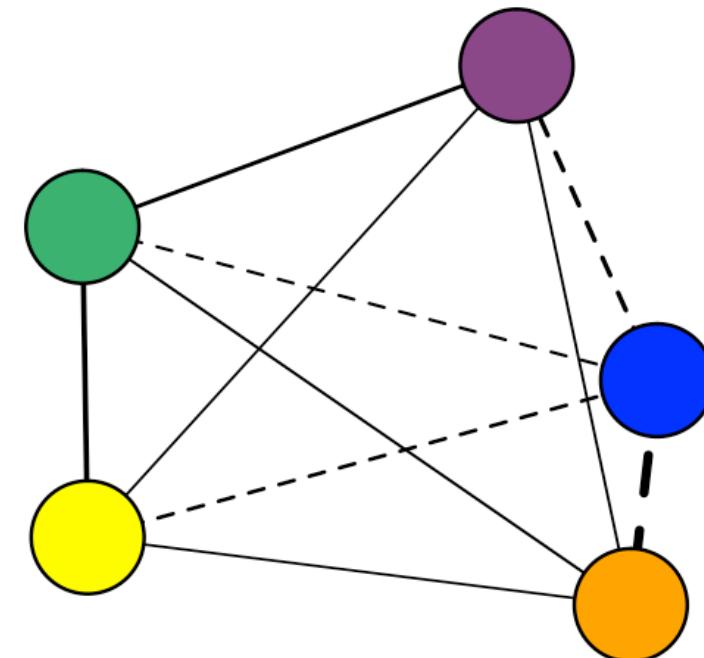
Contemporaneous: Within Time-Points

$$X_{it} \leftrightarrow X_{jt}$$



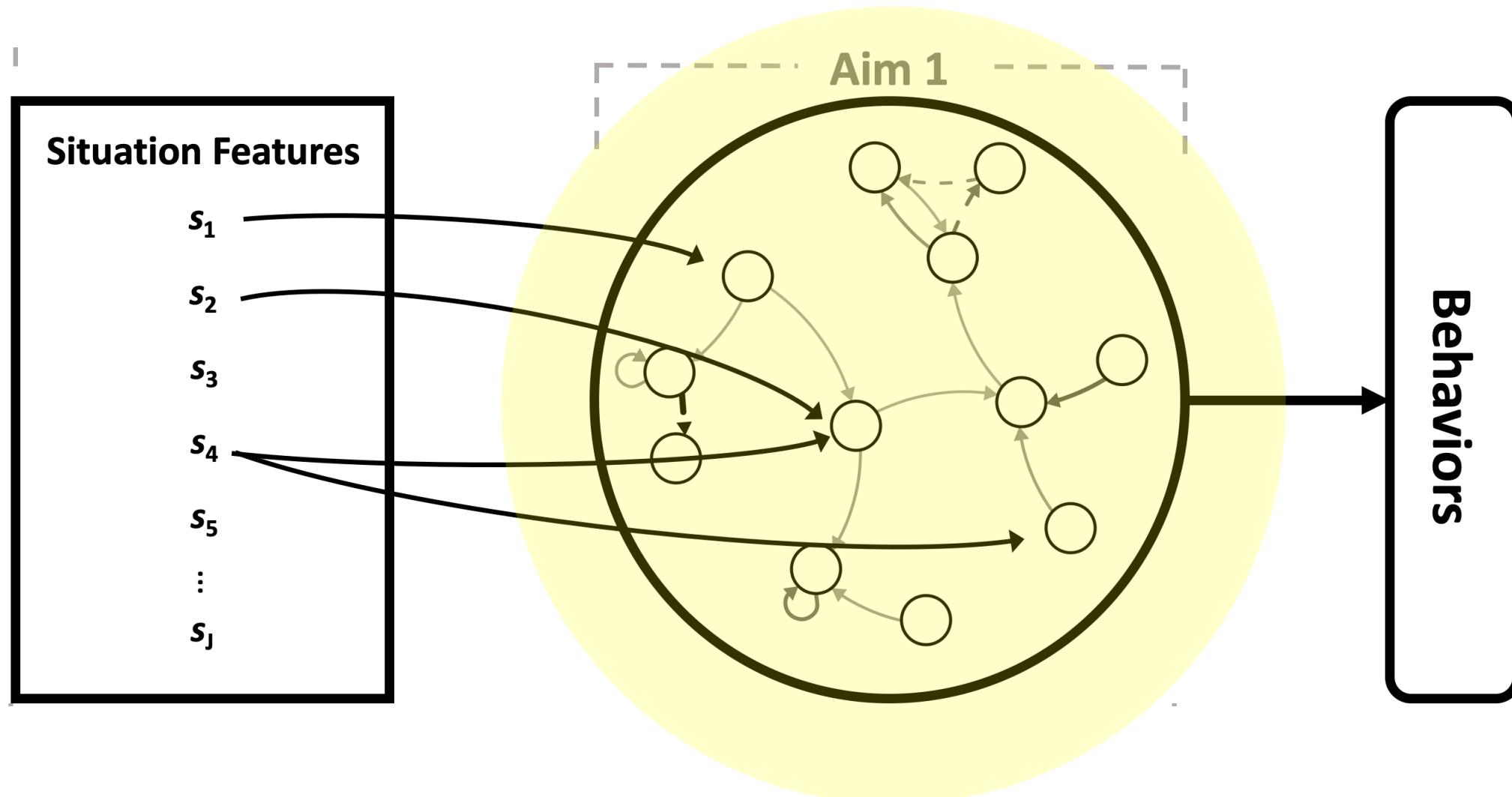
time **E A C N O**

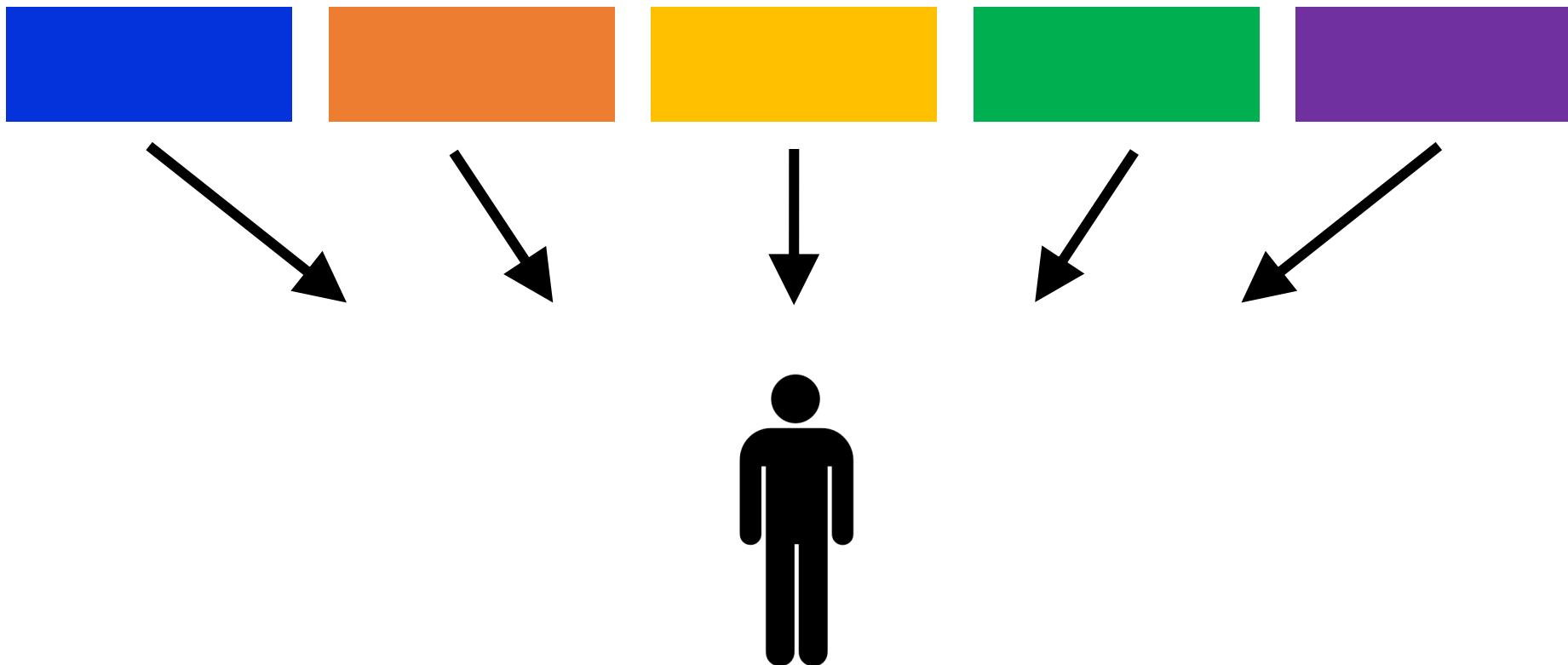
1	4	2	3	2	4
2	2	3	4	1	4
3	3	3	2	2	4
4	3	1	3	2	3
5	4	4	3	2	2
6	4	1	2	3	4
7	2	2	2	2	1
8	4	2	3	3	4
9	3	2	2	1	2
10	4	2	3	3	3
11	3	1	3	2	5



Contemporaneous: Within Time-Points

$$X_{it} \leftrightarrow X_{jt}$$





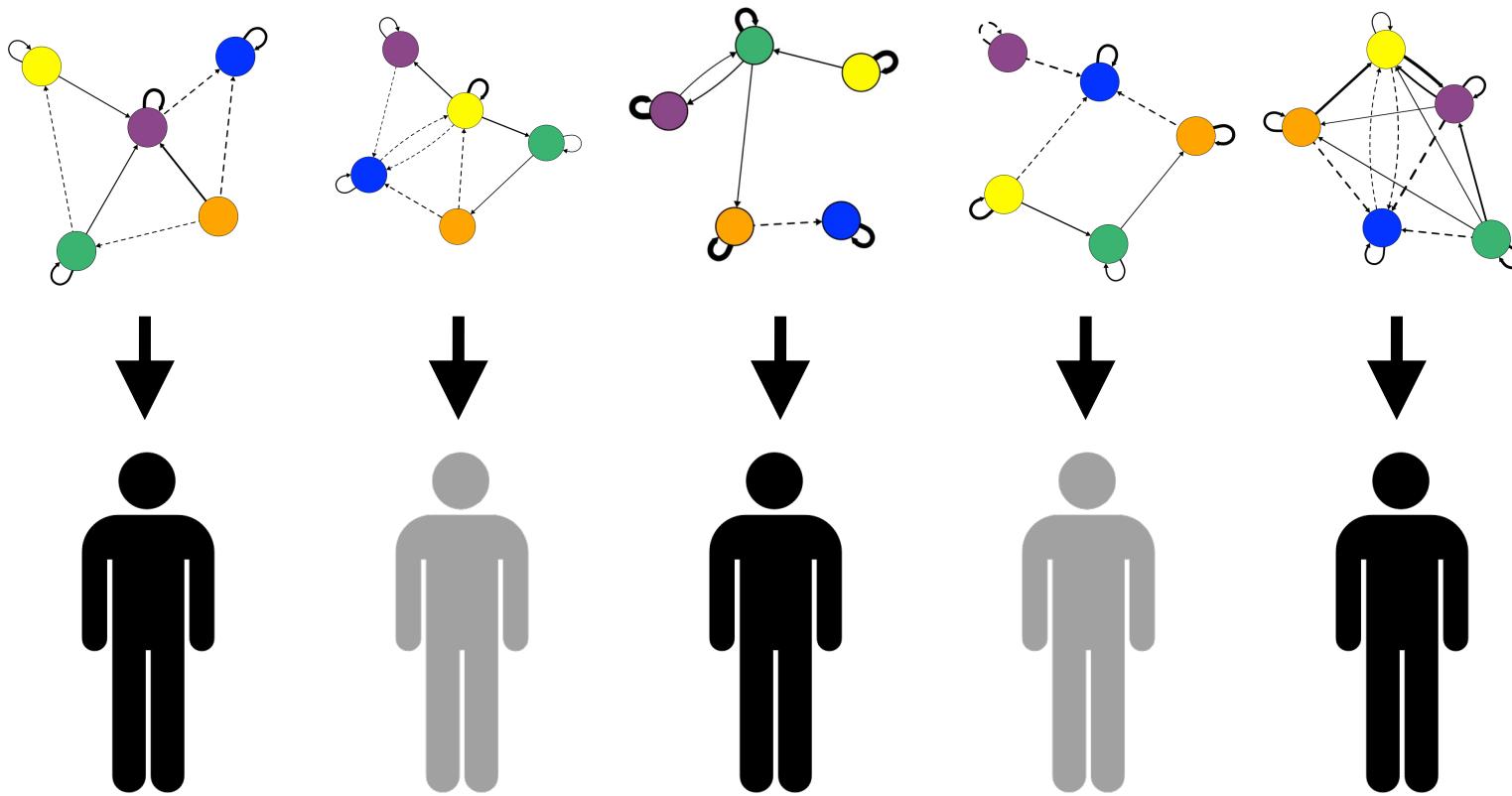
**Idiographic
Person-Centered**

Aim 1: Individuals

Aim 2: Dynamics

Aim 3: Integration

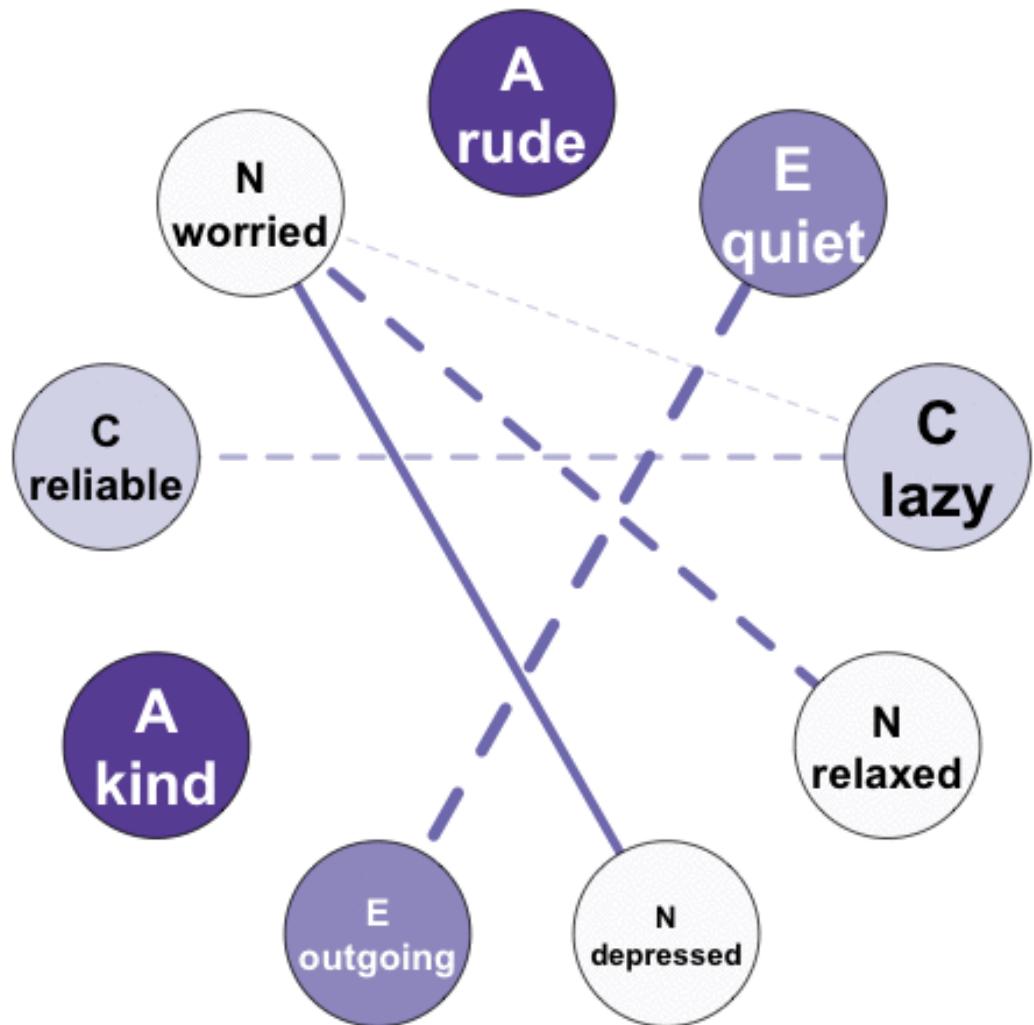
Future Directions



Idiographic

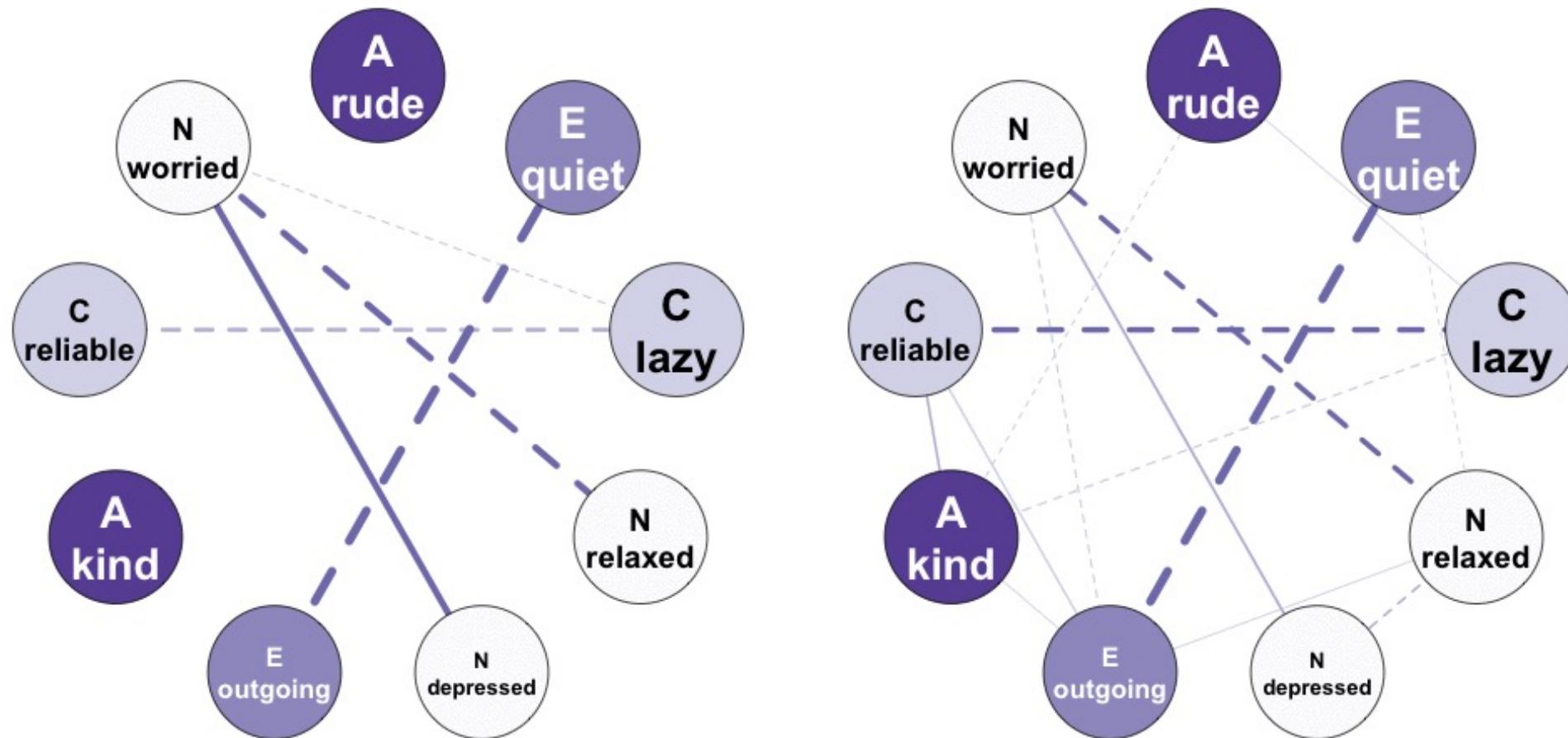
RESULTS

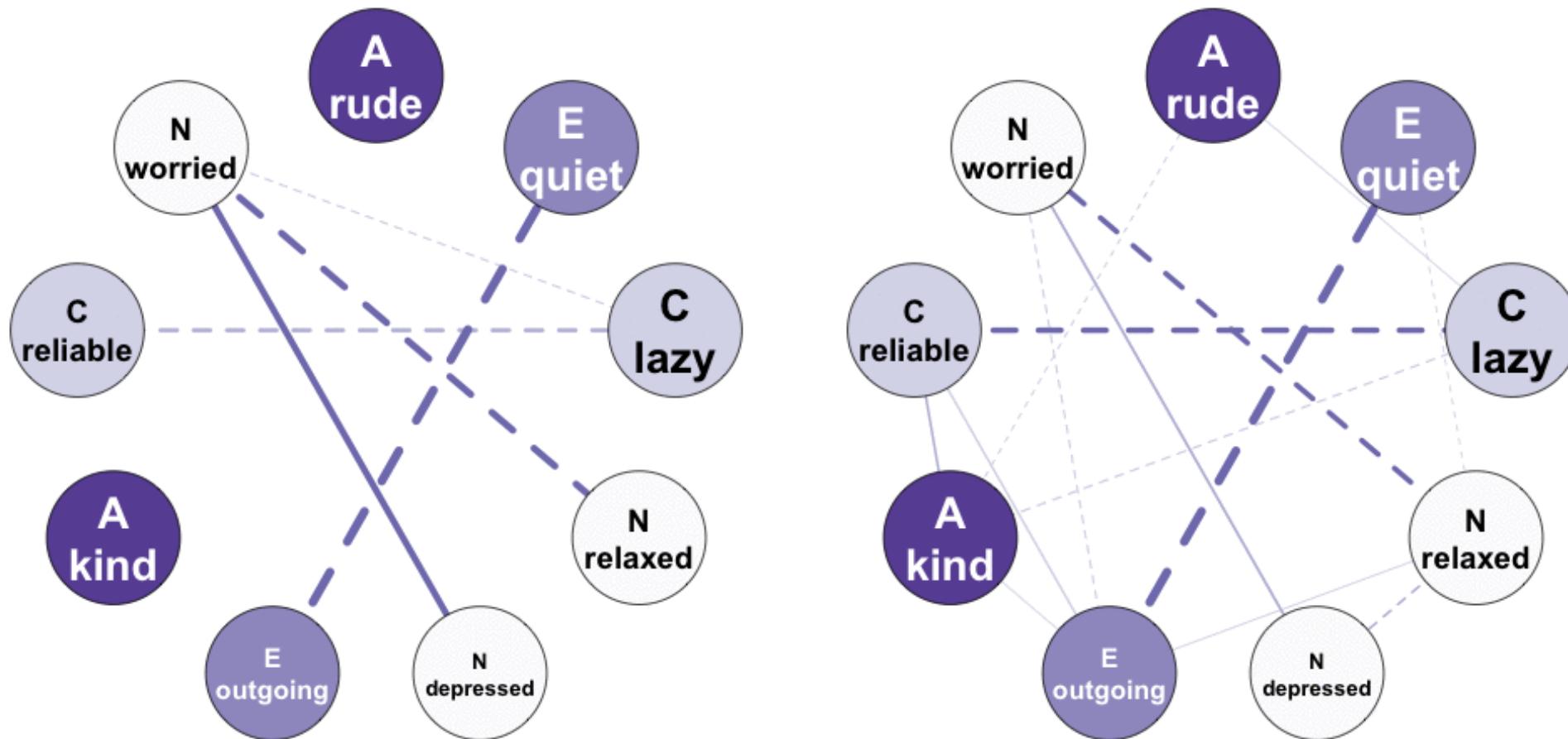
Aim 1

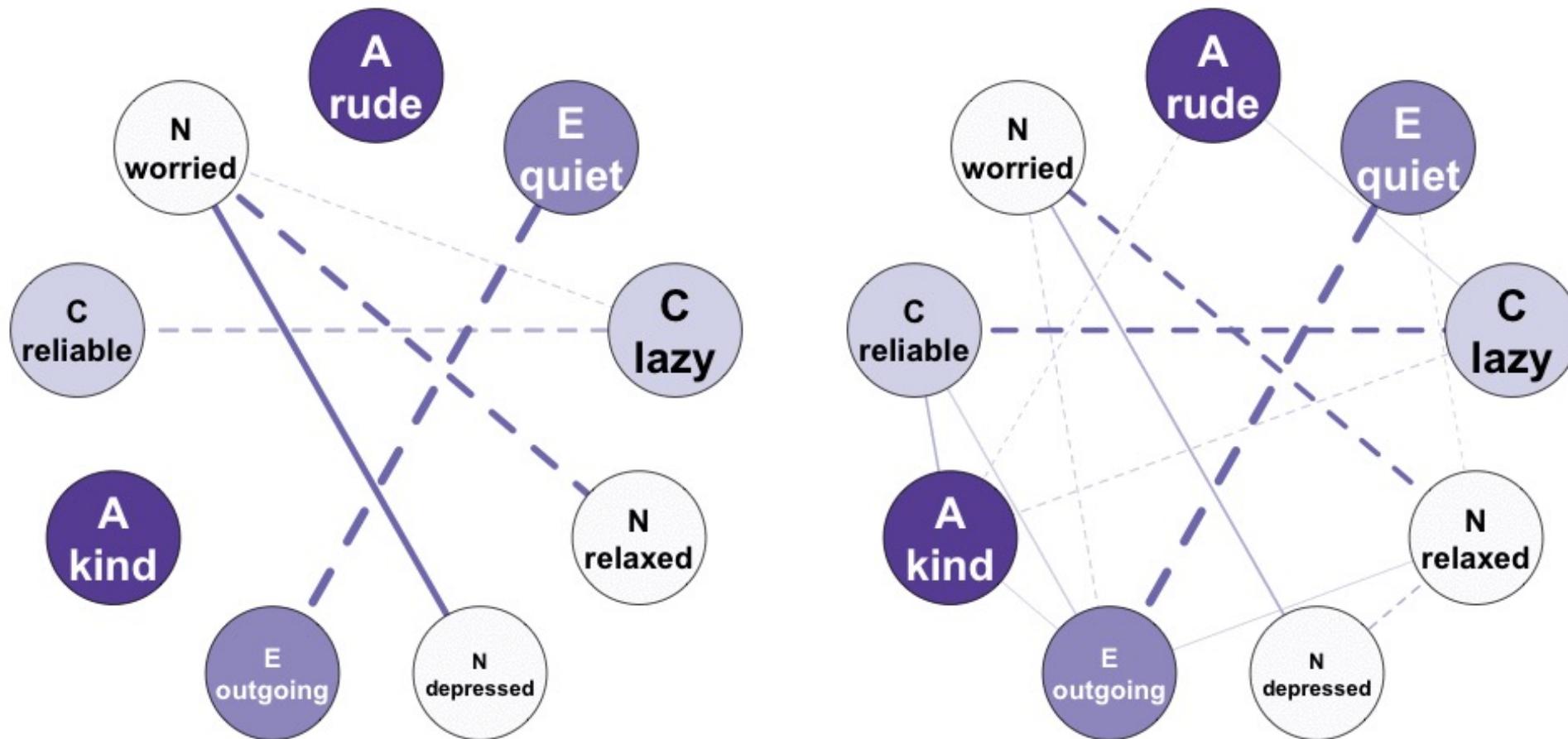


The structures differ across people.

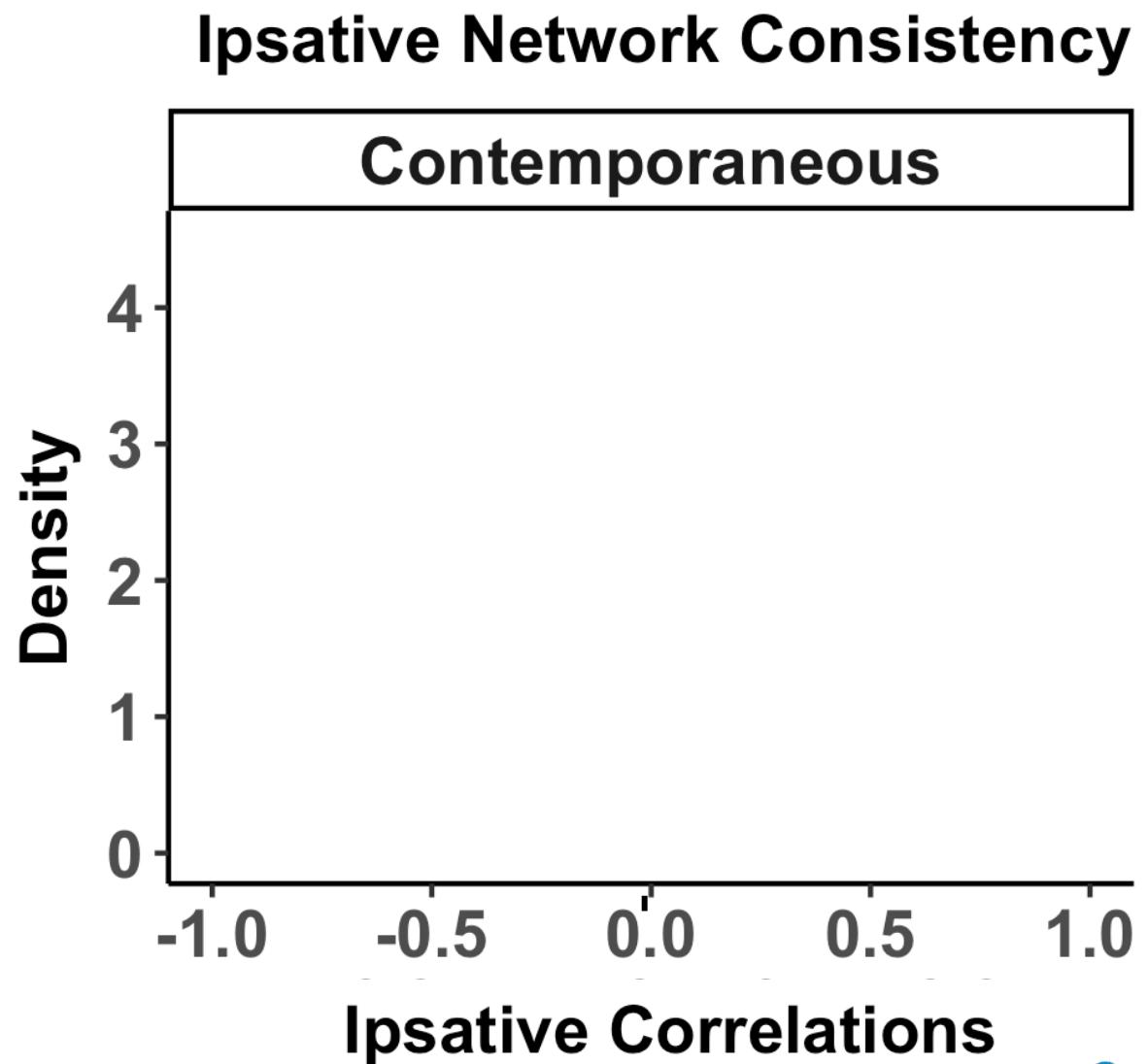
But do they show expected longitudinal consistency?







How consistent is
idiographic personality
across two
years?

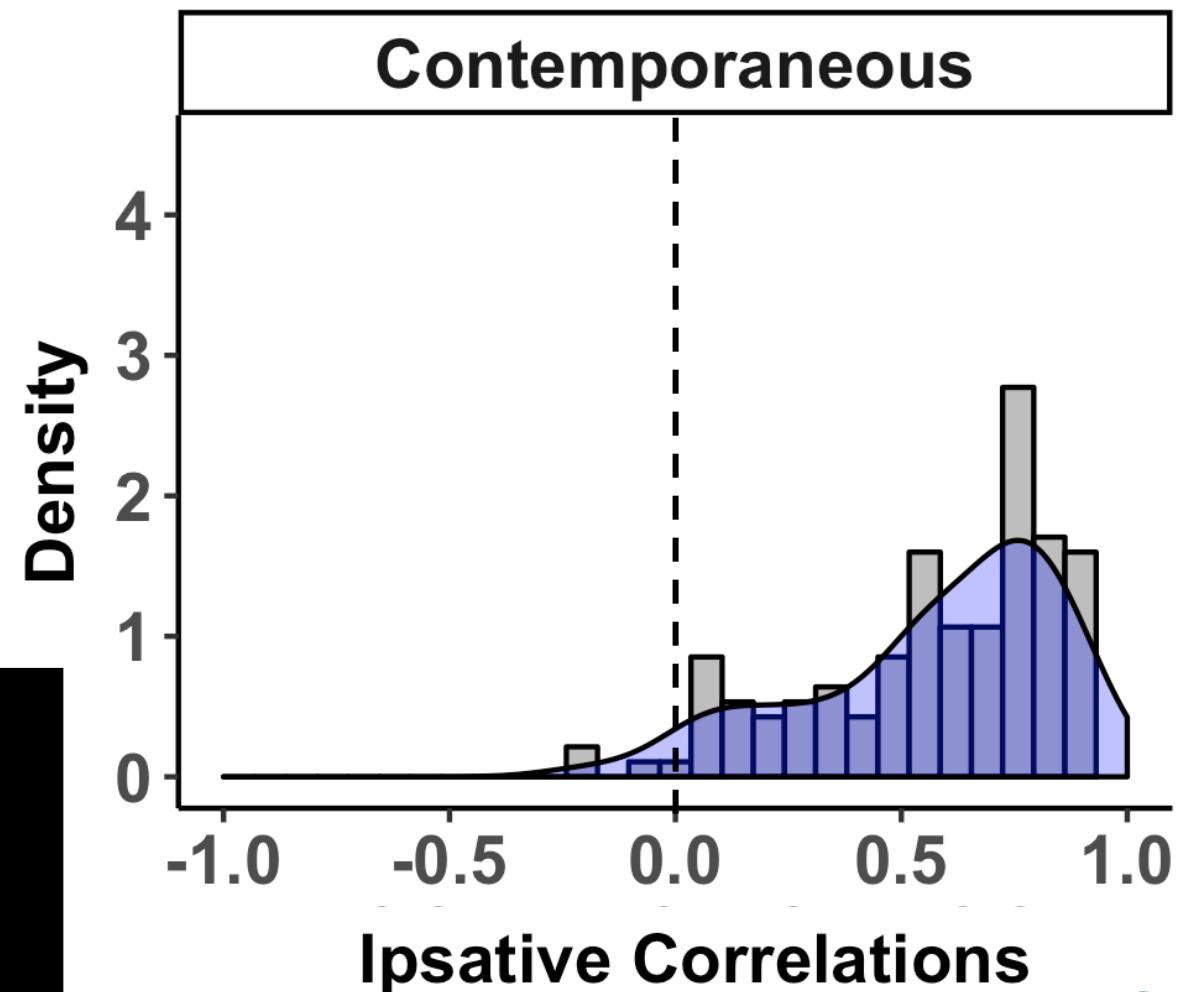


How consistent is
idiographic personality
across two
years?

Idiographic Personality
is consistent over two
years.

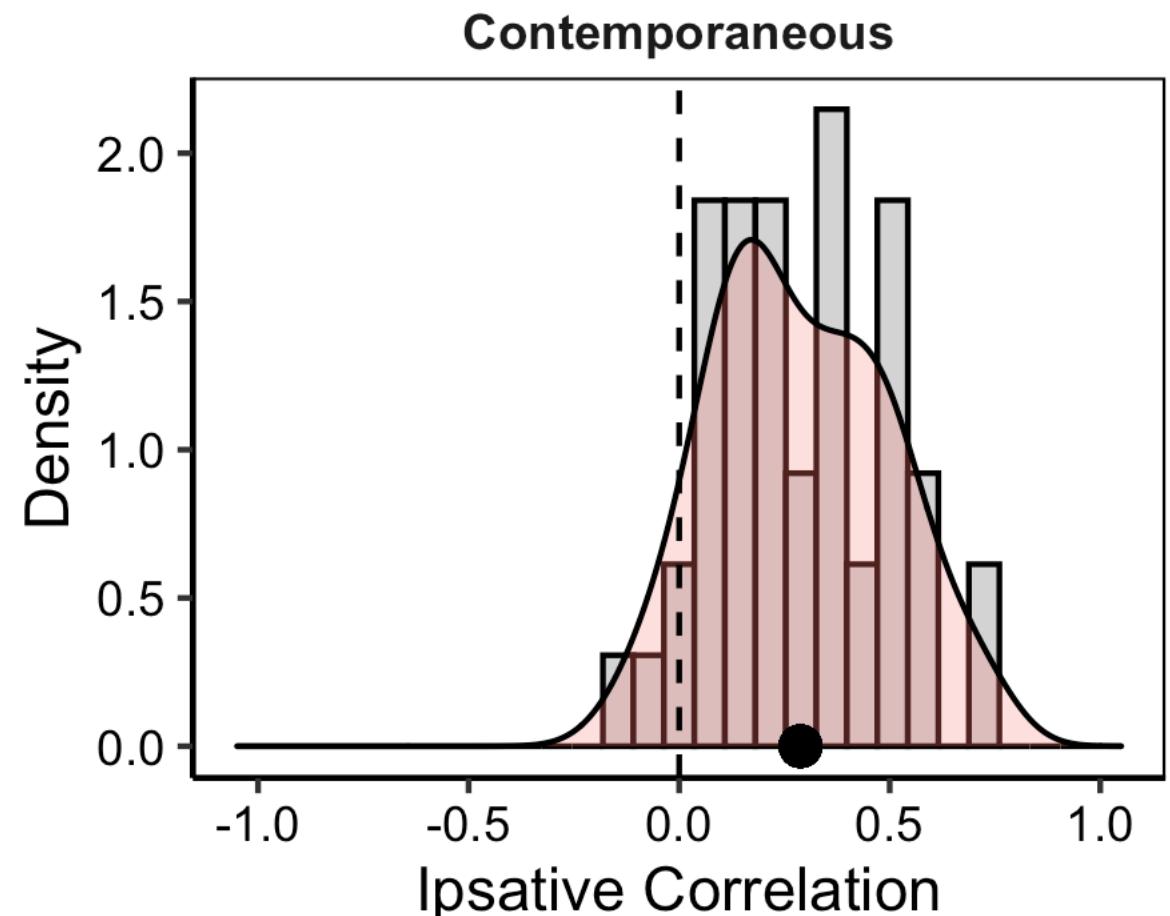
Ipsative Network Consistency

Contemporaneous



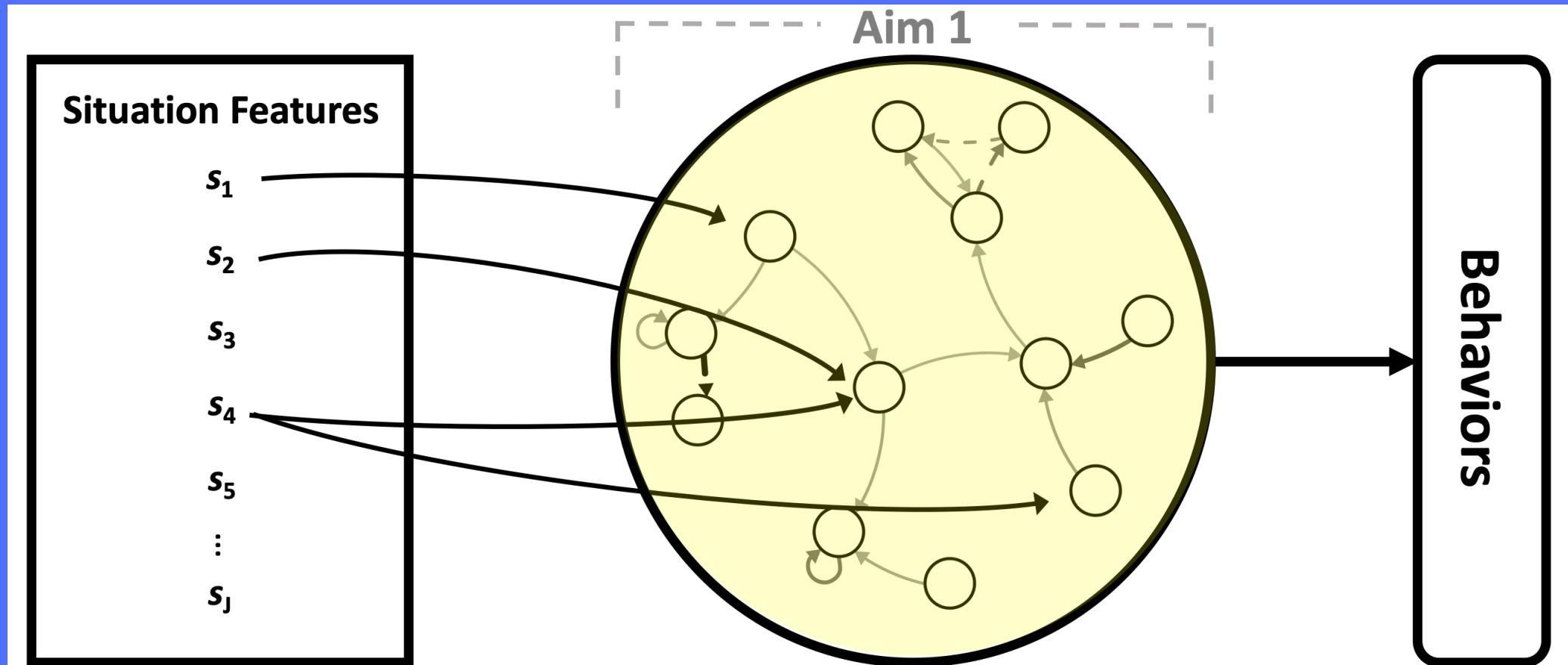
How consistent is
idiographic personality
across two
years?

Idiographic Personality
is consistent over two
years AND global events.



Aim 1: Bringing the individual back in the study of personality structure and change.

Beck & Jackson
(2020, *JPSP*; 2021b; *EJP*)



Aim 1: Bringing the individual back in the study of personality structure and change.

Beck & Jackson
(2020, *JPSP*; 2021b; *EJP*)

Idiographic personality structures are:

Unique (i.e. differ across people).

Relatively consistent over time.

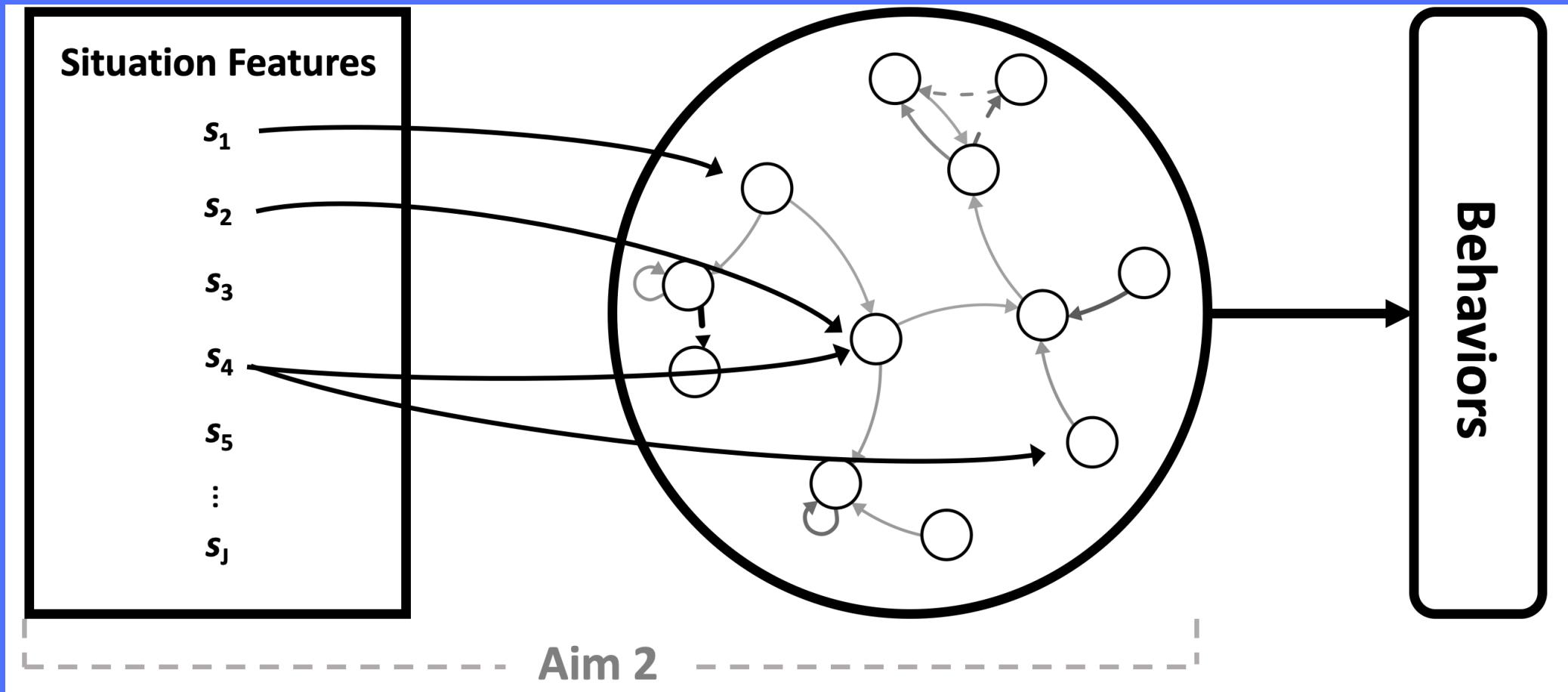
Relatively consistent across global events.

Aim 1: Individuals show unique personality structures that are relatively consistent across time and events.

Beck & Jackson
(2020, *JPSP*; 2021b, *EJP*)

Aim 2: Using longitudinal data to understand how well-being unfolds across contexts.

*Cheung, *Beck, et al.
(under review)

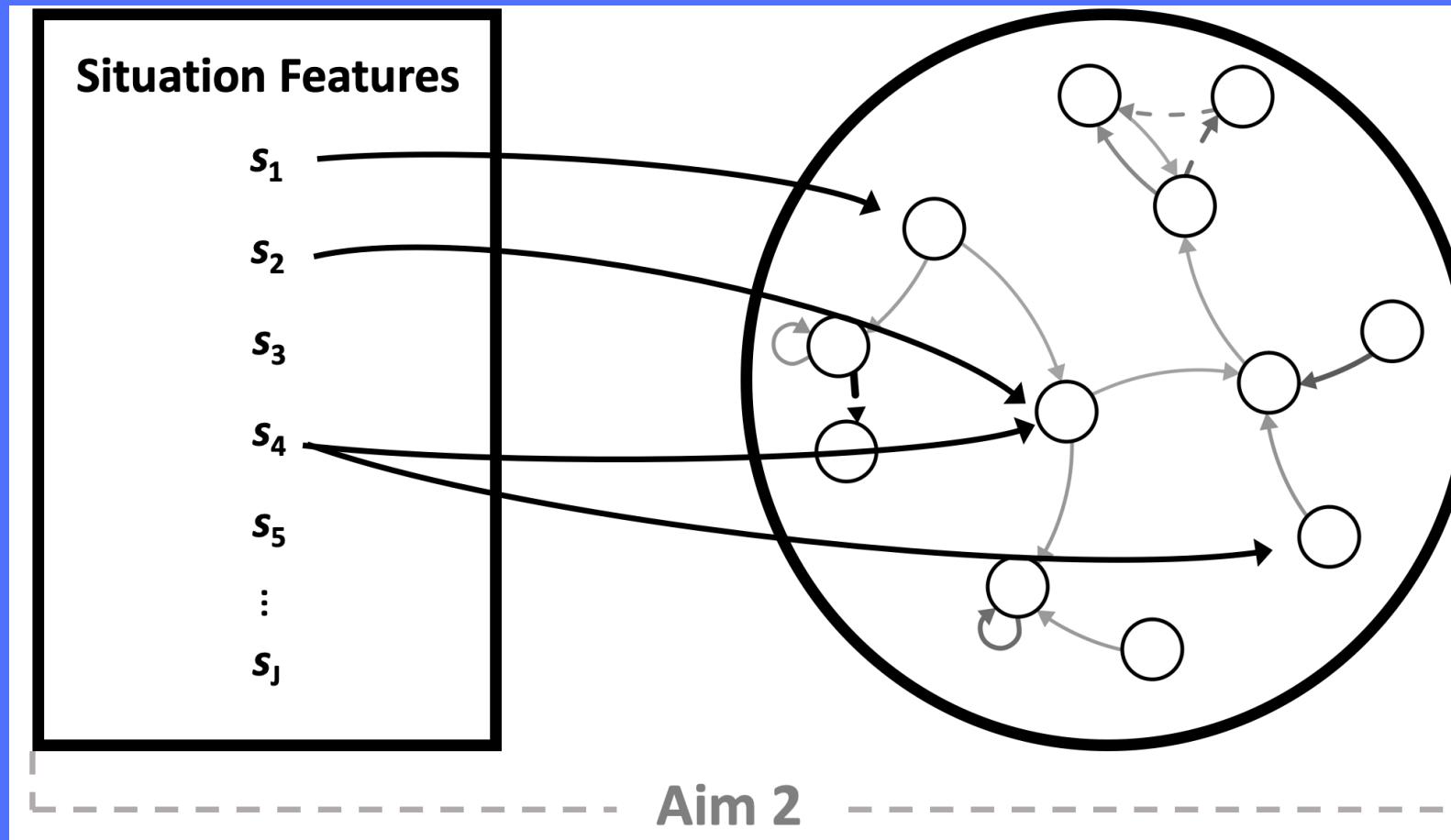


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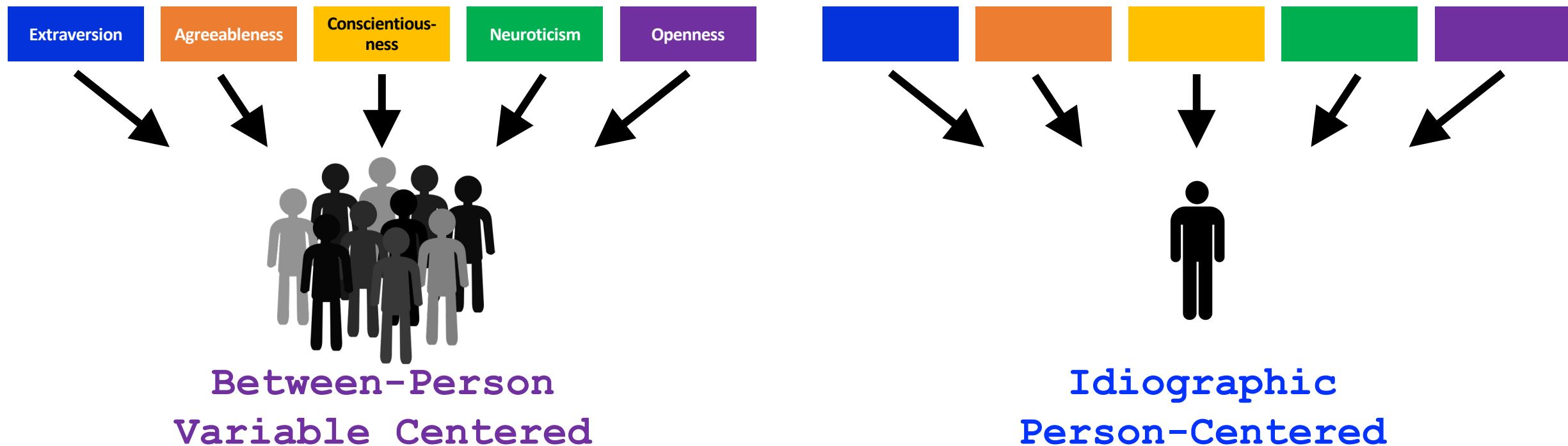
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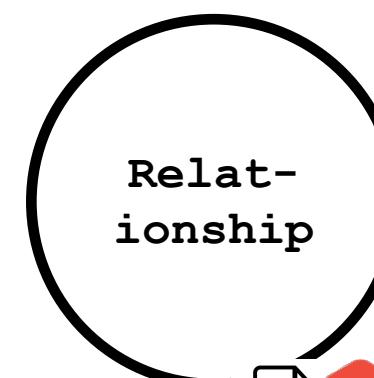
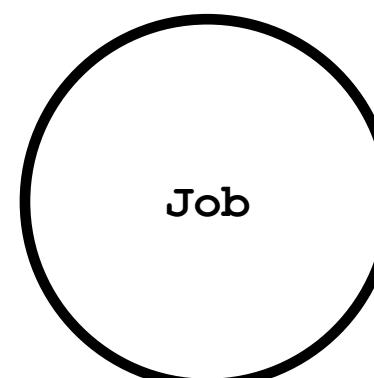
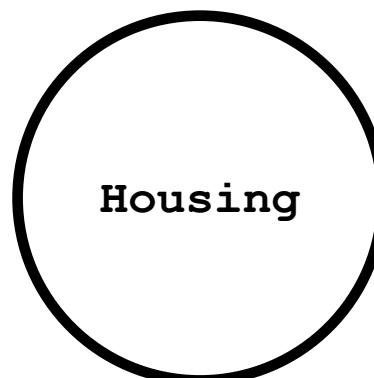
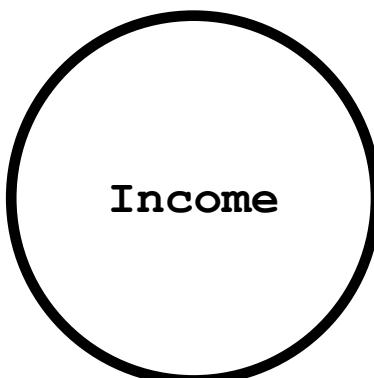


**Strong Theoretical
Models**

**Rich longitudinal
data**

**Unique patterns
ignored**

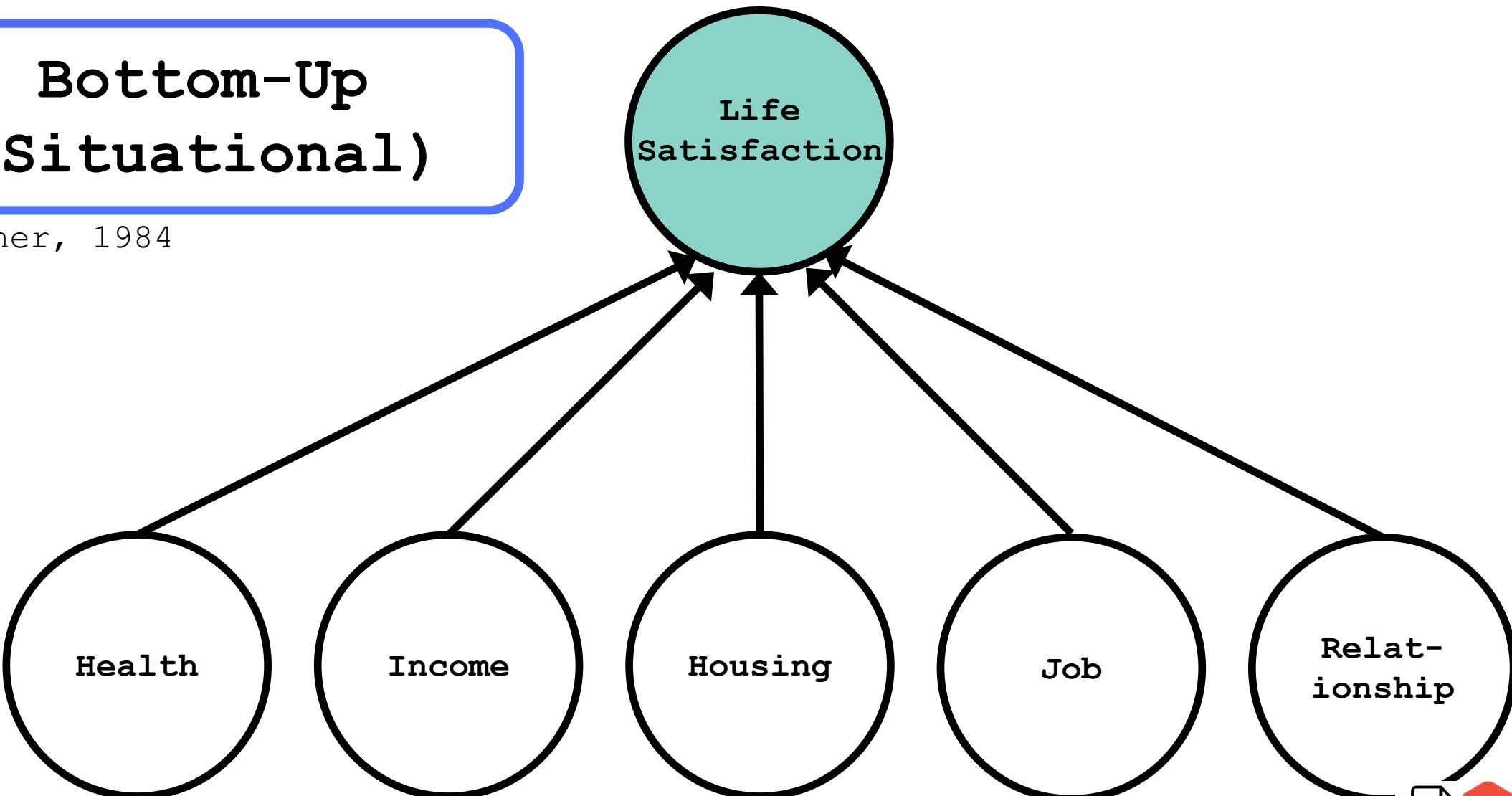
Domain
Satisfaction



Bottom-Up (Situational)

Diener, 1984

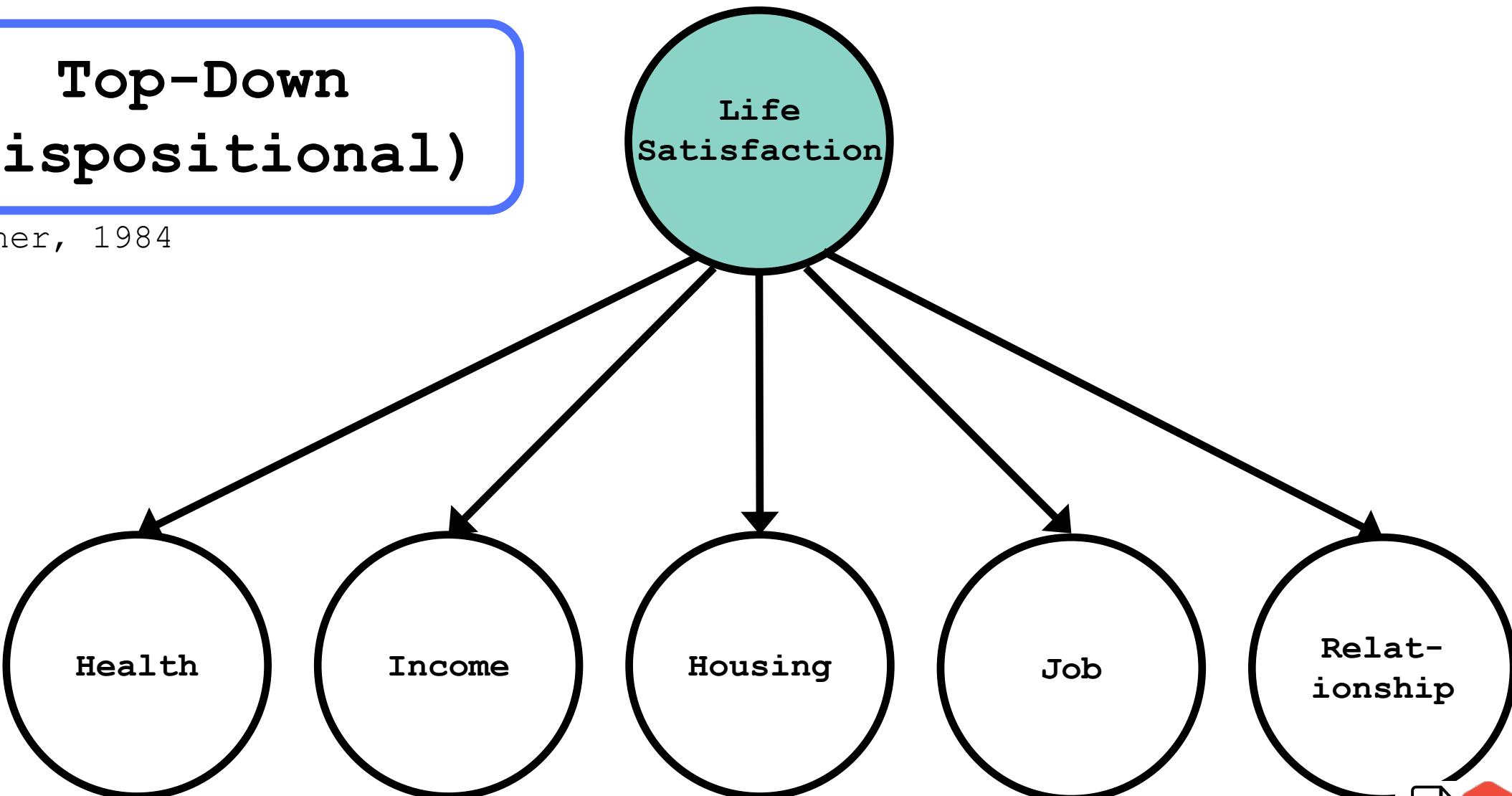
Domain Satisfaction



Top-Down (Dispositional)

Diener, 1984

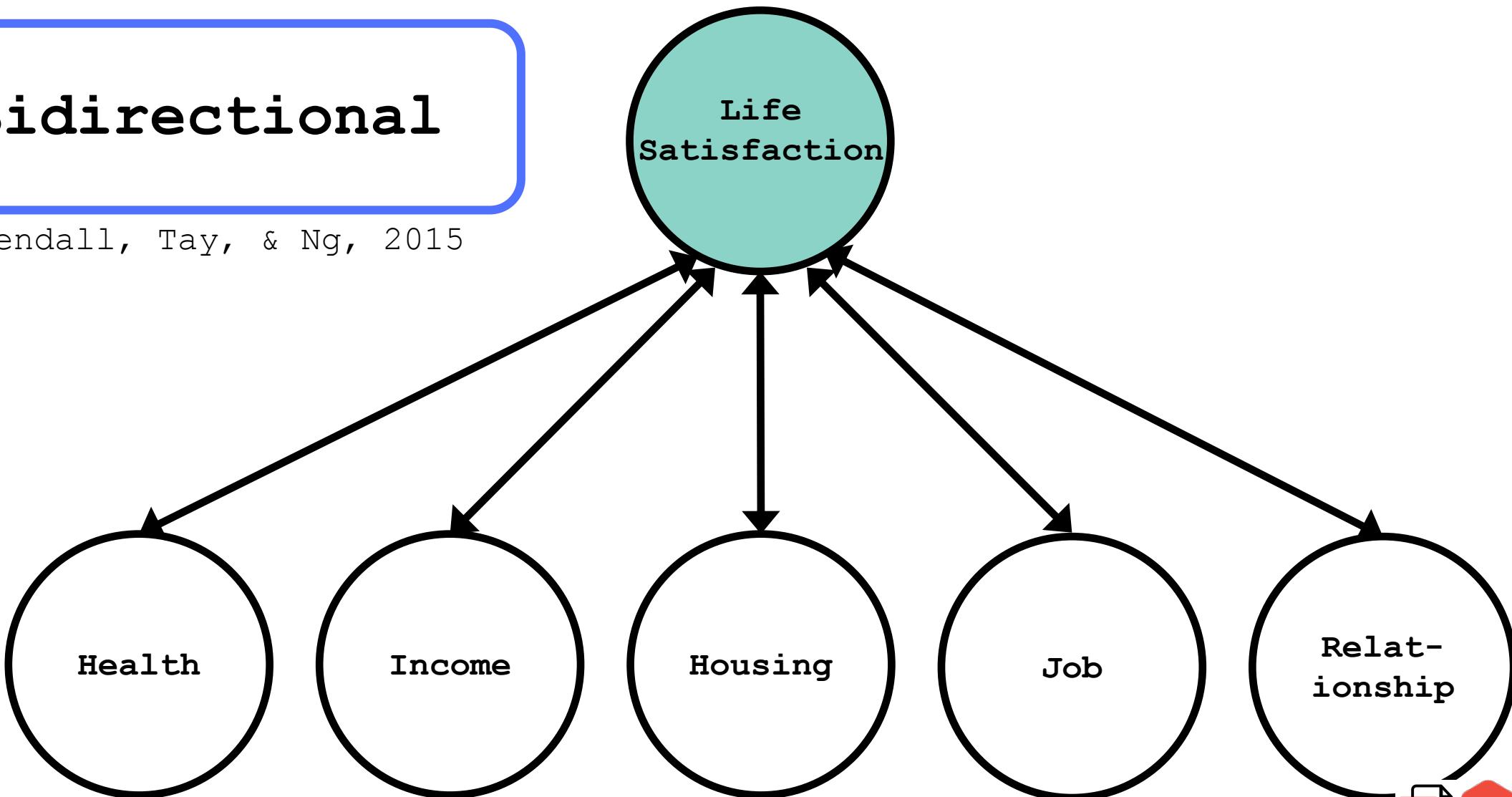
Domain Satisfaction



Bidirectional

Kuykendall, Tay, & Ng, 2015

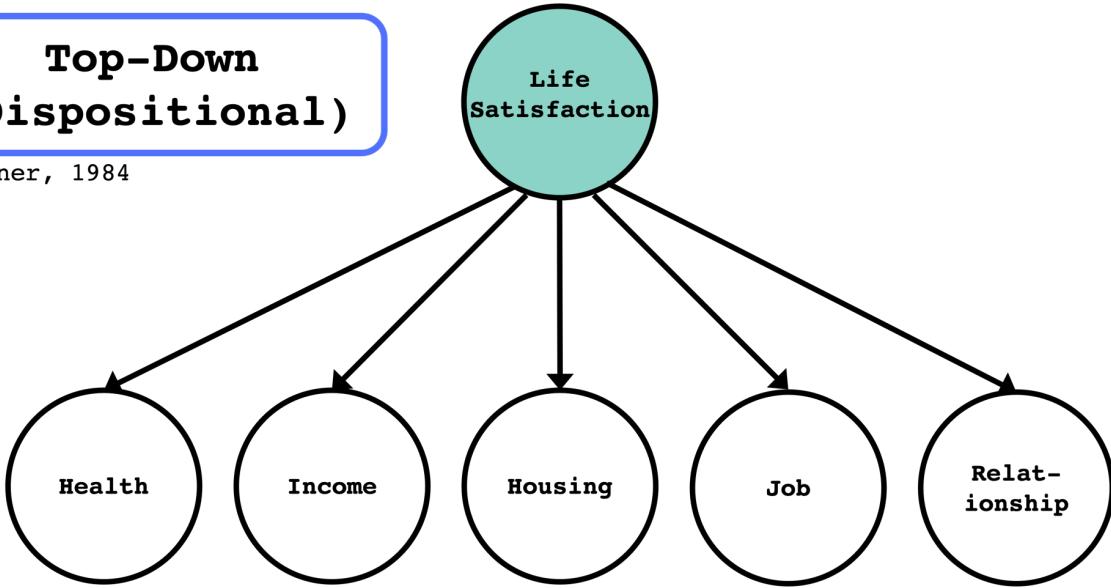
Domain Satisfaction



Top-Down (Dispositional)

Diener, 1984

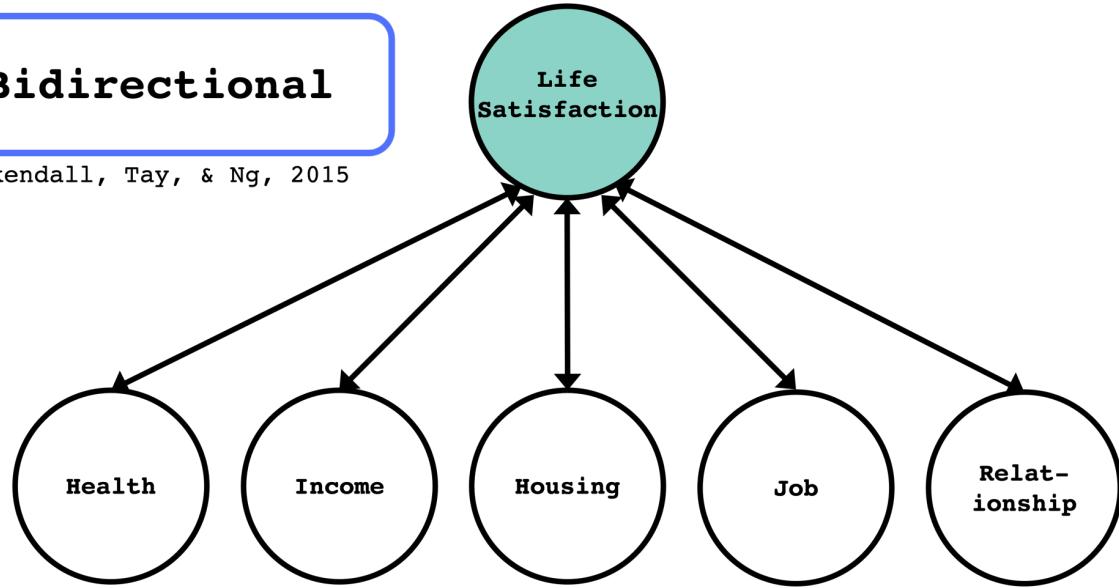
Domain Satisfaction



Bidirectional

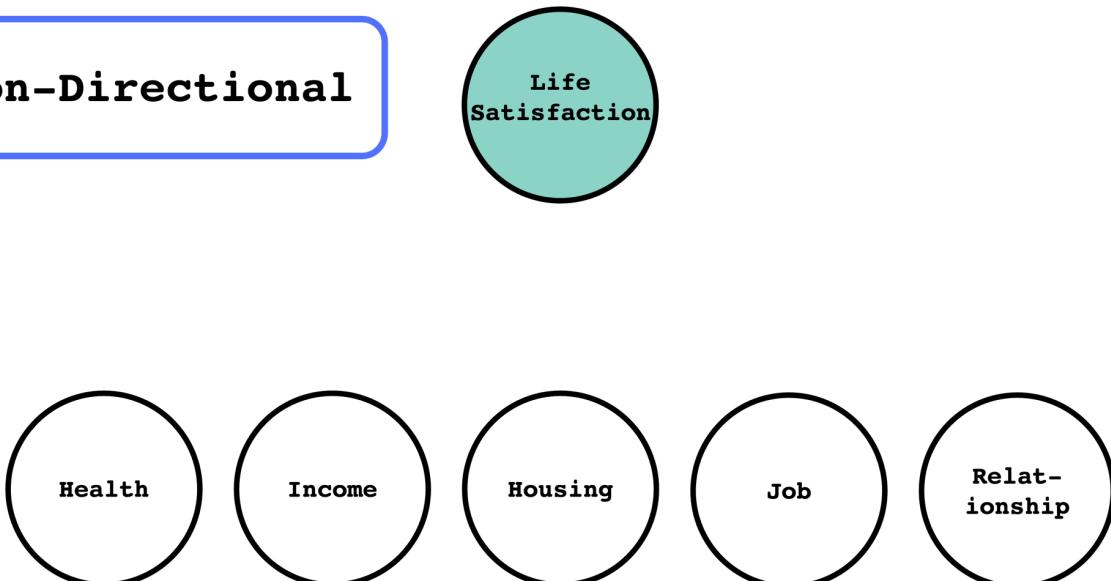
Kuykendall, Tay, & Ng, 2015

Domain Satisfaction



Non-Directional

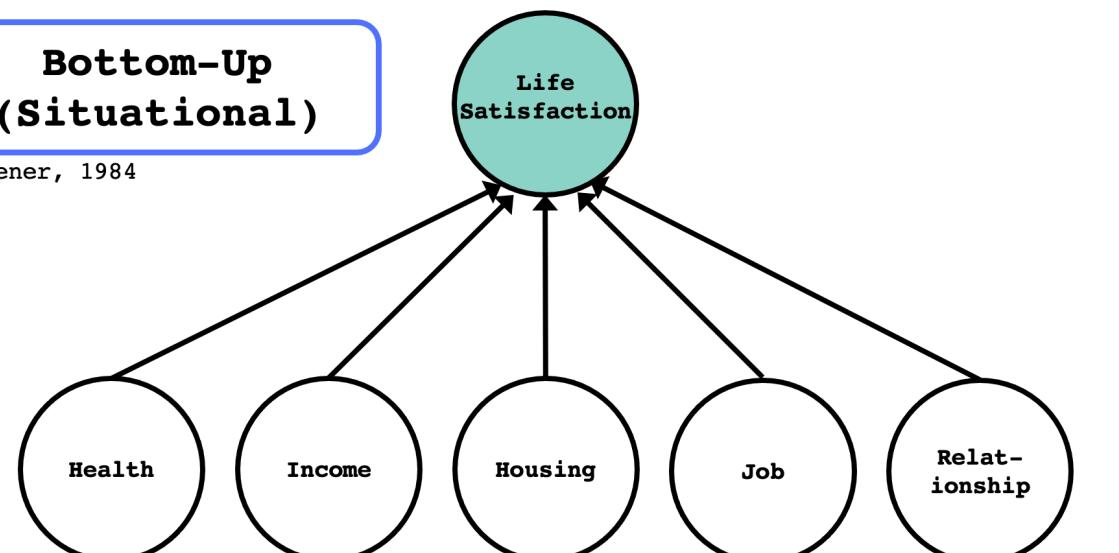
Domain Satisfaction



Bottom-Up (Situational)

Diener, 1984

Domain Satisfaction



GSOEP**HILDA****SHP****BHPS****LISS****Multilevel VAR(1) Models**

Epskamp et al., 2018

Level 1:

$$Y_{ptj} = \beta_{0pj} + \beta_{1pj} * V_{1,p,t-1} + \dots + \beta_{kpj} * V_{k,p,t-1} + \varepsilon_{ptj}$$

Level 2:

$$\beta_{0pj} = \gamma_{00j} + \gamma_{01j} * \bar{V}_{1,p} + \dots + \gamma_{01j} * \bar{V}_{kp} + r_{0pj}$$

$$\vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots$$

$$\beta_{kpj} = \gamma_{k0j} + \gamma_{k1j} * \bar{V}_{p,1} + \dots + \gamma_{kkj} * \bar{V}_{pj} + r_{kpj}$$

**Between-Person Effects
(Level 2)**

$$\gamma_{01j} - \gamma_{0kj}$$

**Within-Person Effects
(Level 1)**

$$\gamma_{10j} - \gamma_{kkj}$$

**Person-Specific Effects
(Level 2 random effects)**

$$r_{0pj} - r_{kpj}$$

GSOEP

HILDA

SHP

BHPS

LISS

Multilevel VAR(1) Models

Epskamp et al., 2018

Level 1:

$$Y_{ptj} = \beta_{0pj} + \beta_{1pj} * V_{1,p,t-1} + \dots + \beta_{kpj} * V_{k,p,t-1} + \varepsilon_{ptj}$$

Level 2:

$$\beta_{0pj} = \gamma_{00j} + \gamma_{01j} * \bar{V}_{1,p} + \dots + \gamma_{01j} * \bar{V}_{kp} + r_{0pj}$$

$$\vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots$$

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**Between-Person Effects
(Level 2)**

$$\gamma_{01j} - \gamma_{0kj}$$

**Within-Person Effects
(Level 1)**

$$\gamma_{10j} - \gamma_{kkj}$$

**Person-Specific Effects
(Level 2 random effects)**

$$r_{0pj} - r_{kpj}$$

RESULTS

Aim 2

Top Down

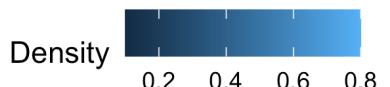
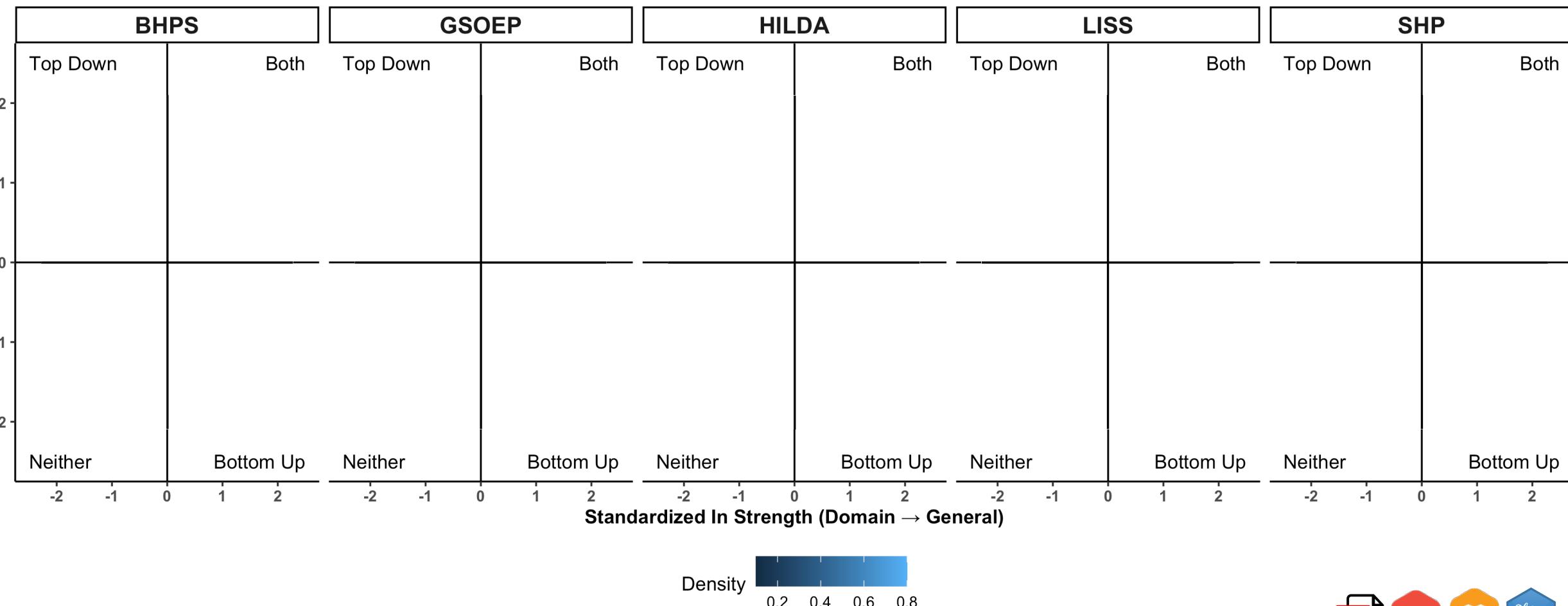
Bi-directional

Non-Directional

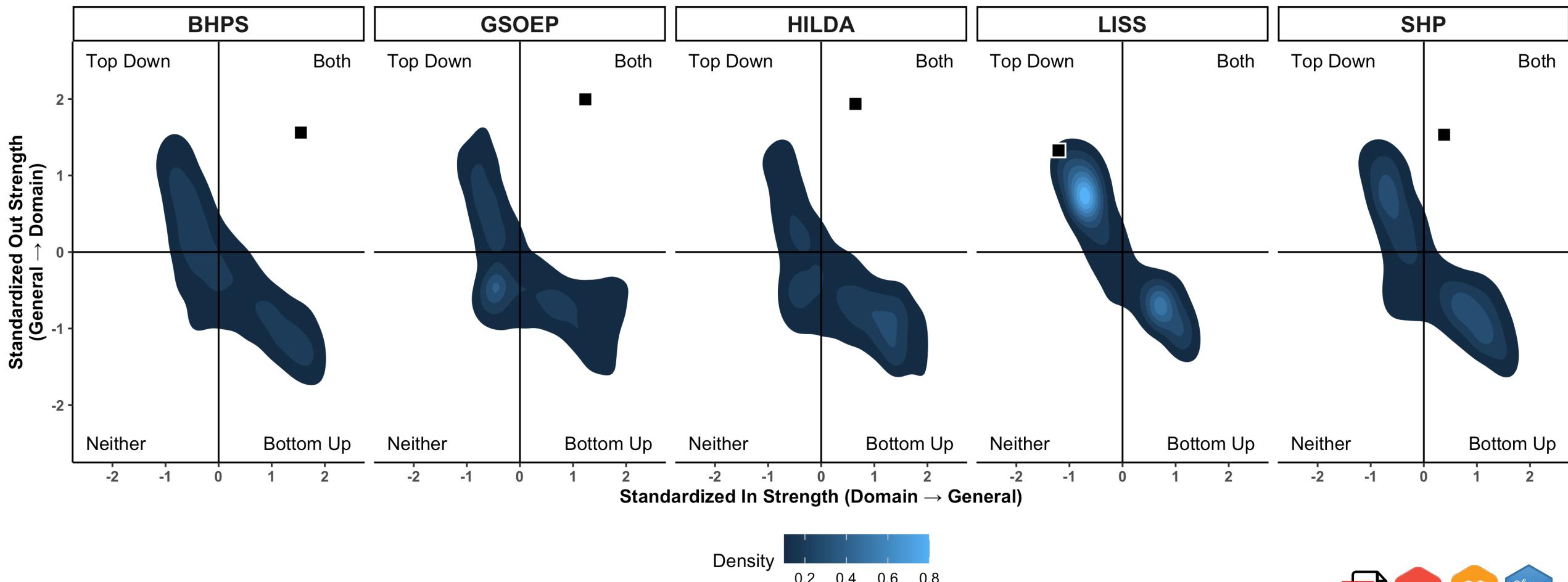
Bottom Up



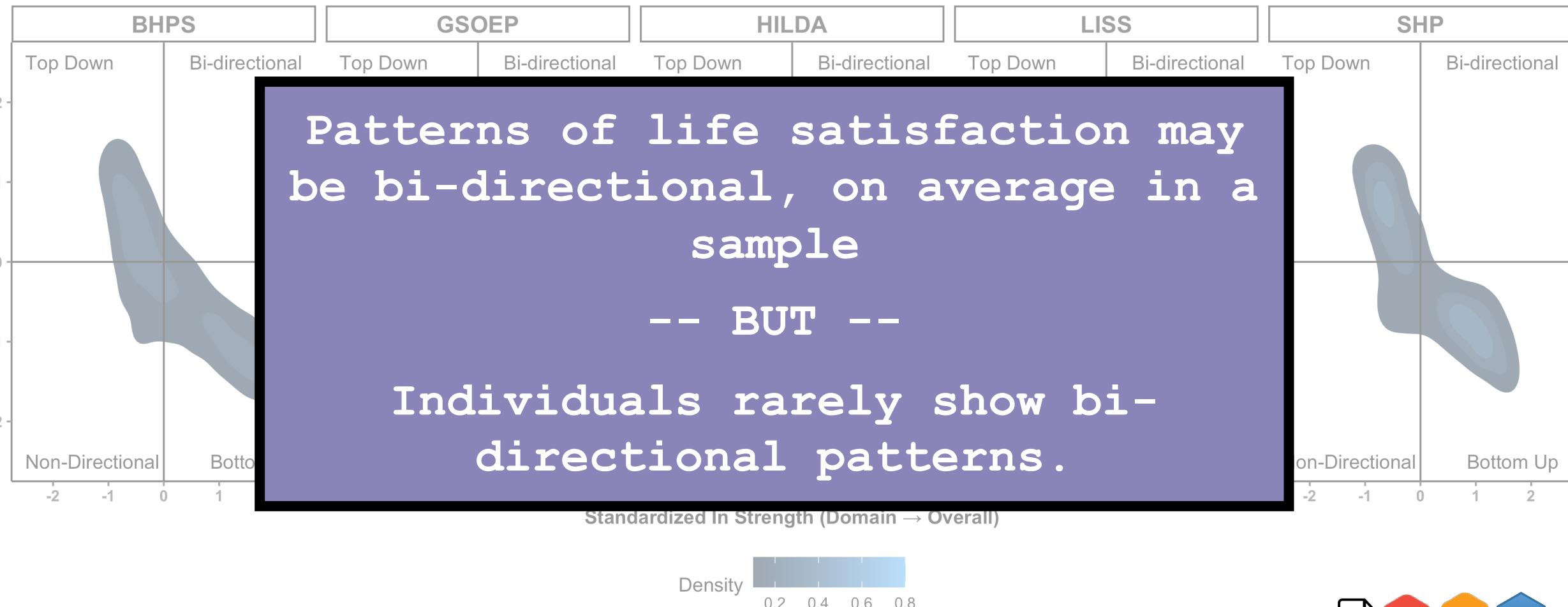
*Cheung, *Beck,
Thapa, & Jackson
(under review)



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Thapa, & Jackson
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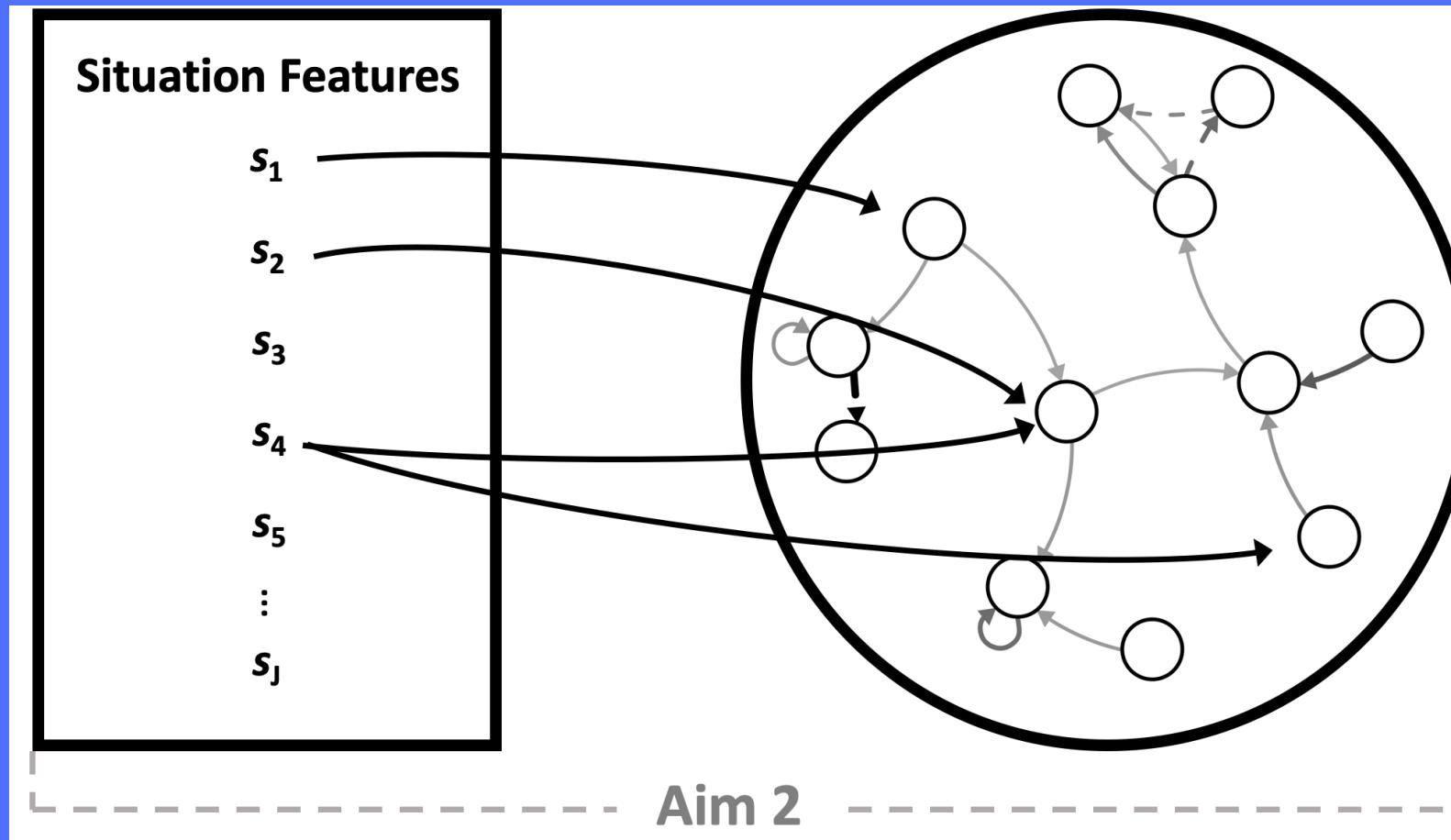
*Cheung, *Beck,
Thapa, & Jackson
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Aim 1: Individuals show unique personality structures that are relatively consistent across time and events.

Beck & Jackson
(2020, *JPSP*; 2021b; *EJP*)

Aim 2: Using longitudinal data to understand how well-being unfolds across contexts.

*Cheung, *Beck, et al.
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(under review)

The dynamics of life and domain satisfaction:

Unfold differently across people

Do not appear well-captured by sample averages of idiographic dynamics

Have similar patterns of individual differences across samples

Aim 1: Individuals show unique personality structures that are relatively consistent across time and events.

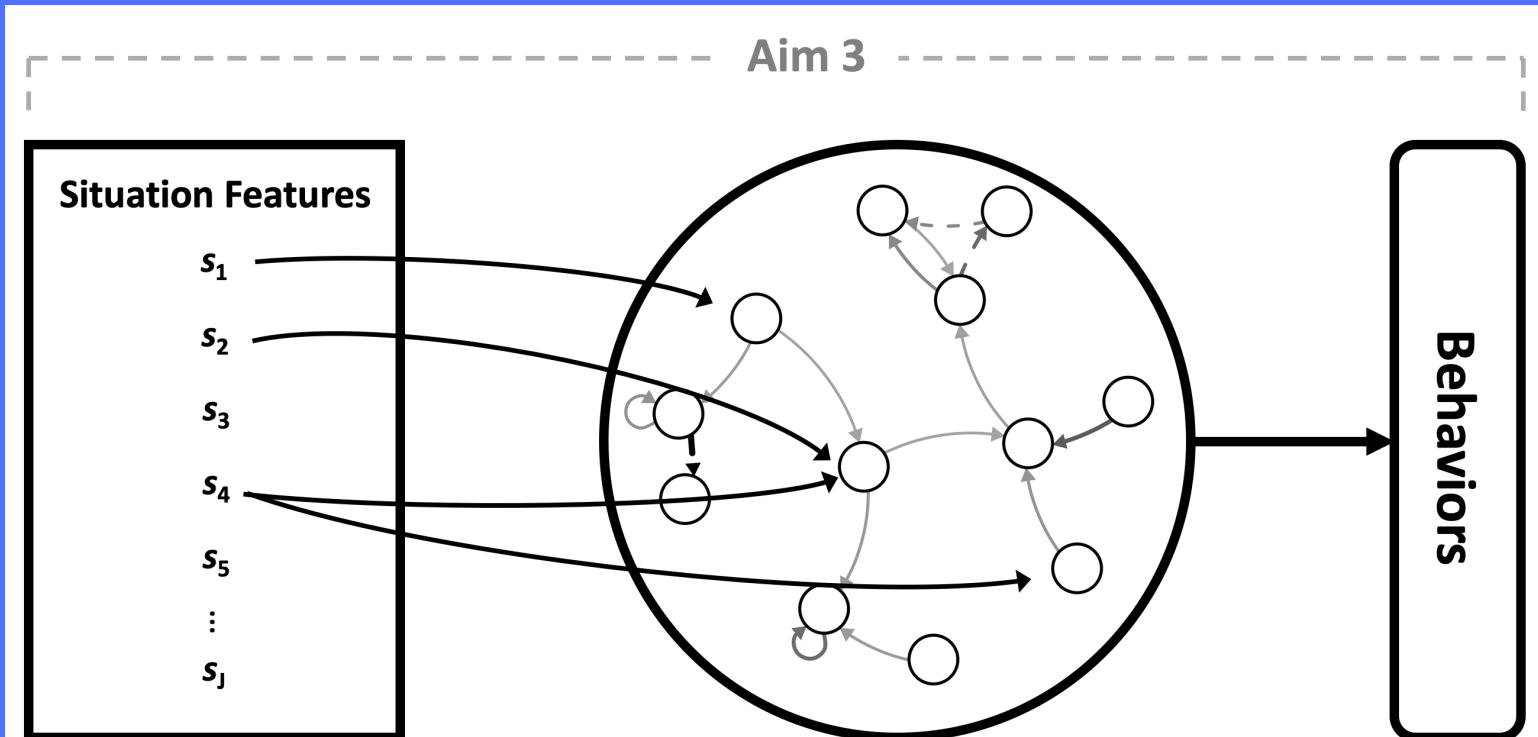
Beck & Jackson
(2020, *JPSP*; 2021b, *EJP*)

Aim 2: The dynamics of well-being unfold differently across people.

*Cheung, *Beck, et al.
(under review)

Aim 3: Predicting behavior using machine learning.

Beck & Jackson
(revision submitted, *Psych Science*)



* = shared first authorship.

Psychological

Situations

Behavior /
Experiences

Critical Assumption

Situations and experiences should have similar consequences across people.

People with similar levels of a personality characteristic should behave in similar ways.

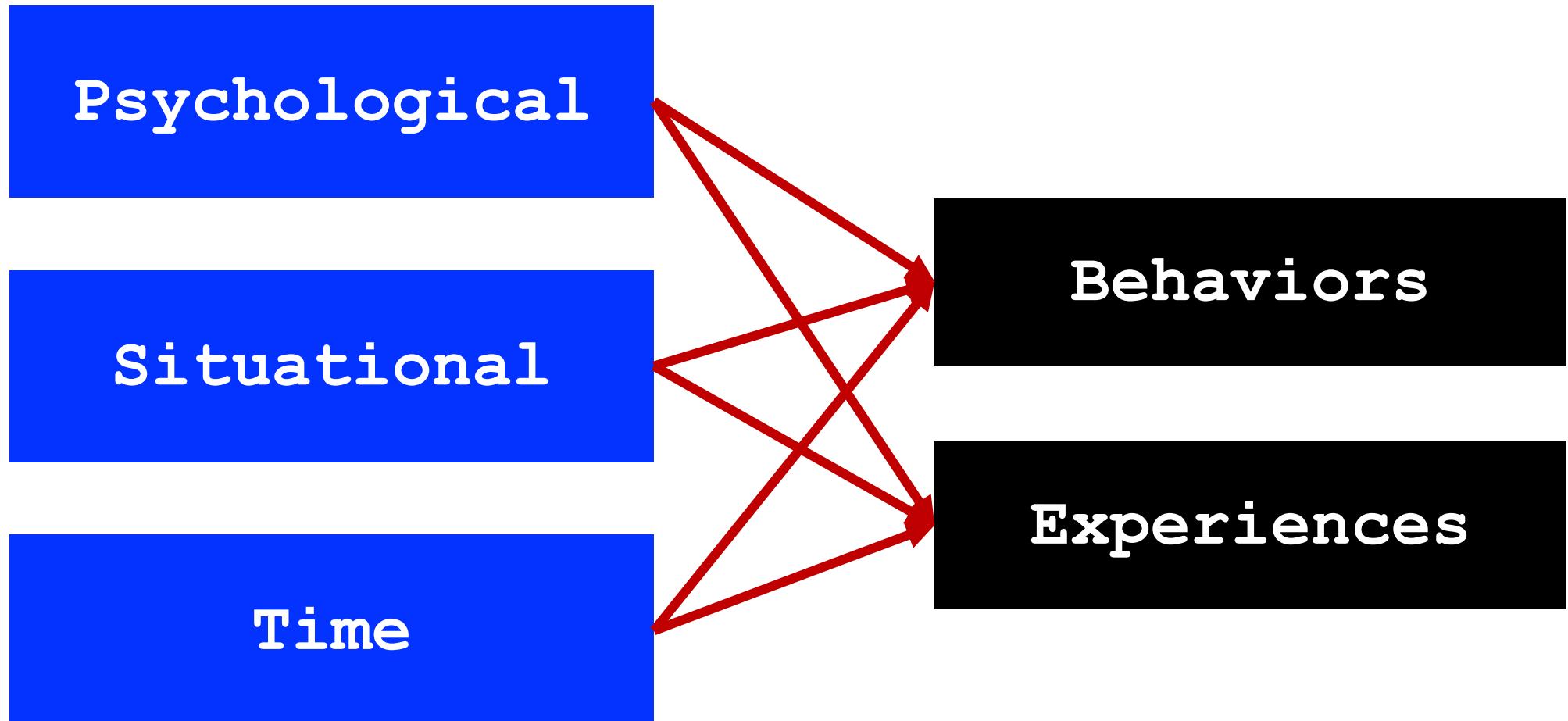


Alternative Assumption

Situations and experiences should have ***different*** consequences across people.

People with similar levels of a personality characteristic ***may not*** behave in similar ways.

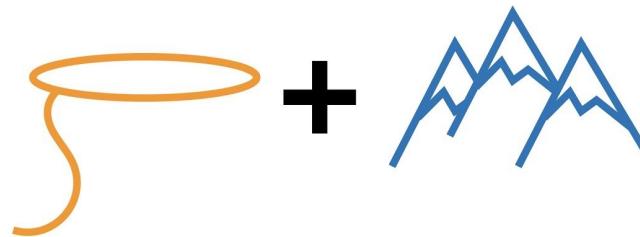




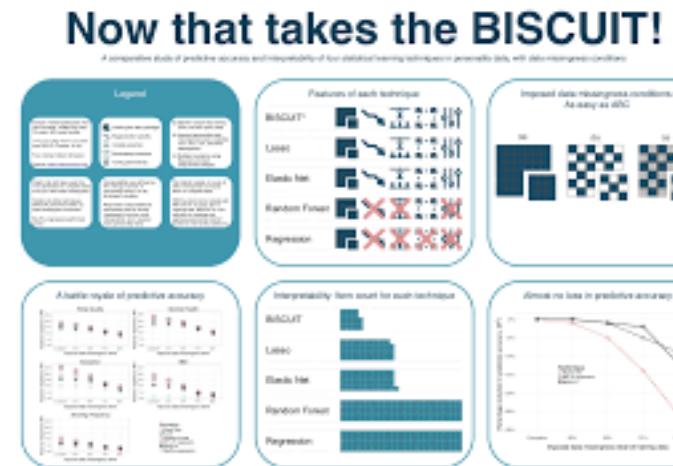
Analytic Plan

3 machine learning classification methods:

Elastic Net

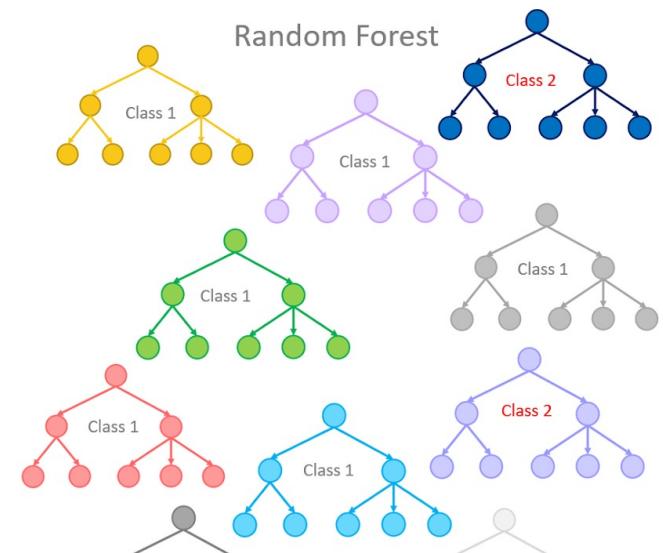


BISCWIT



- Classification Accuracy
- Area under the receiver operating curve (AUC)

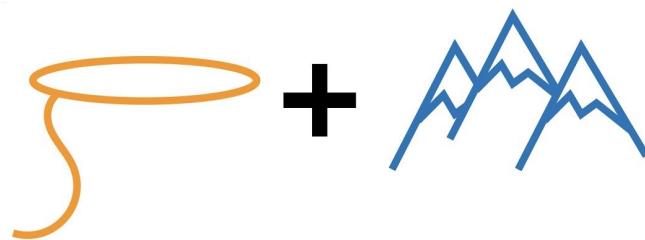
Random Forest



Analytic Plan

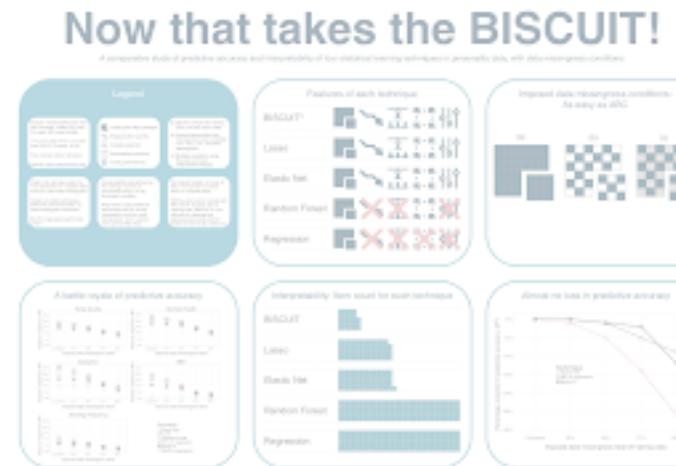
3 machine learning classification methods:

Elastic Net

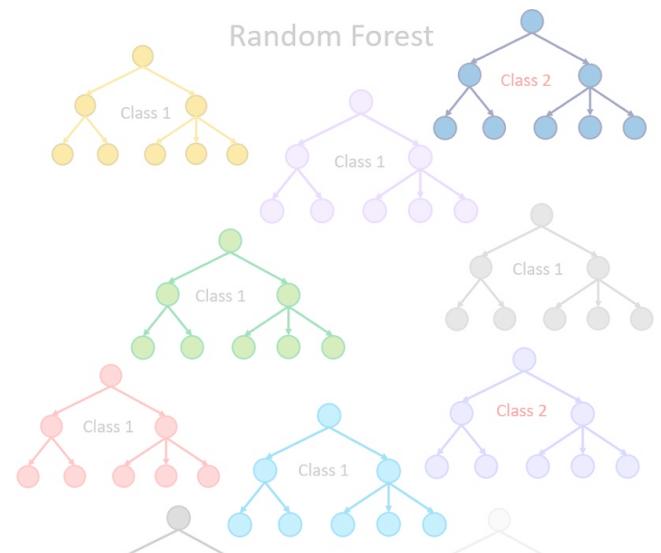


- Classification Accuracy
- Area under the receiver operating curve (AUC)

BISCWIT



Random Forest



RESULTS

Aim 3

Classification Accuracy

Elastic Net

Median (SD)	N
-------------	---

Procrastination

Loneliness

Argument

Interacted

Studying

Sick

Tired



Classification Accuracy

Elastic Net

Classification accuracy was high, on average, with some variability across outcomes.

Sick

Tired

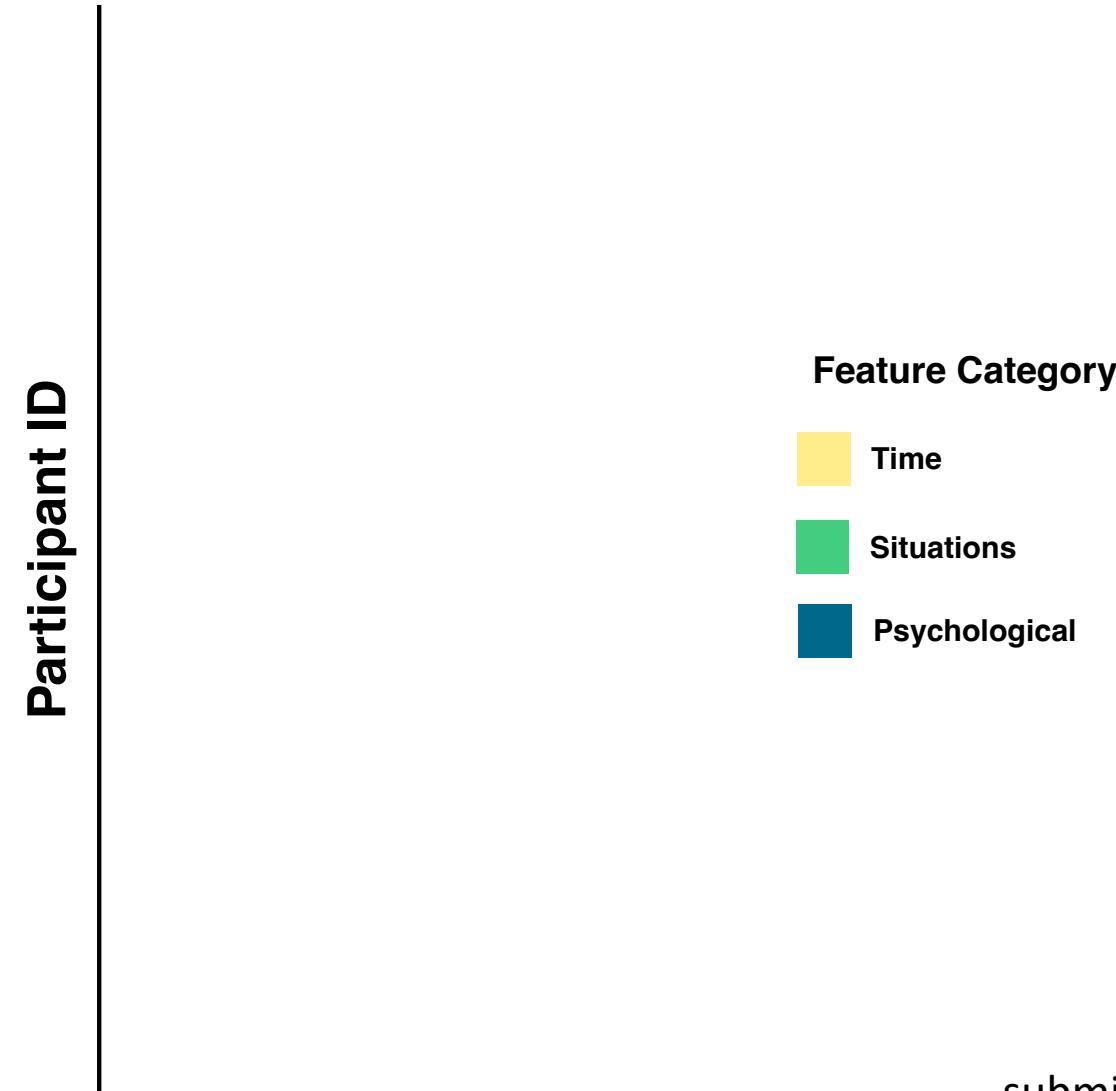


Do certain categories of features out-predict others?

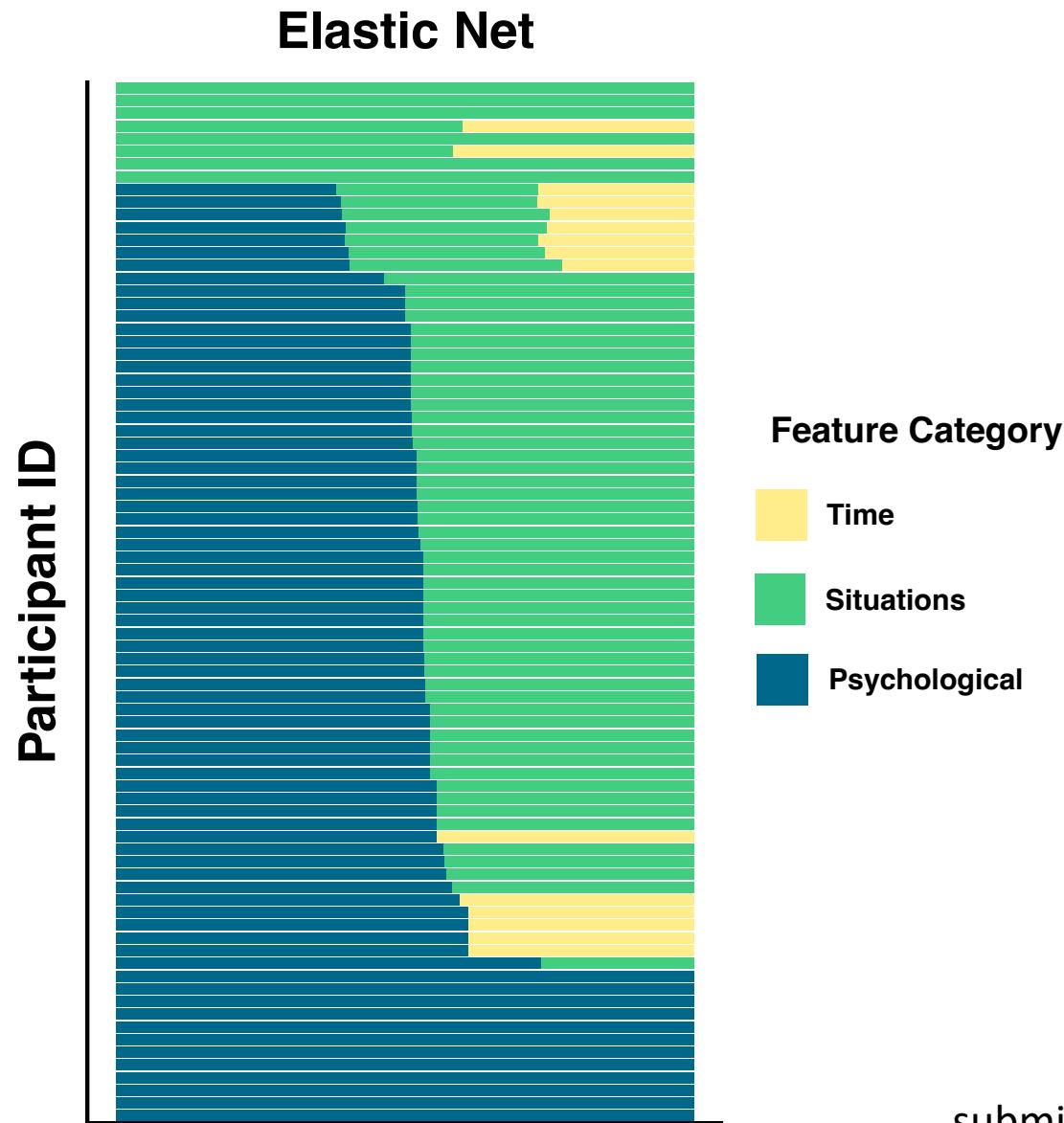


Do certain categories of features out-predict others?

Elastic Net



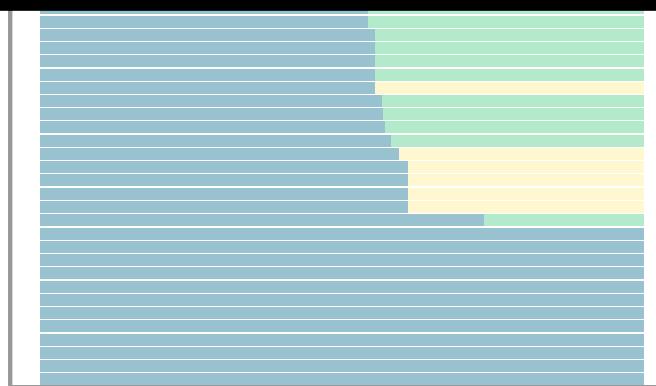
Do certain categories of features out-predict others?



Do certain categories of features out-predict others?

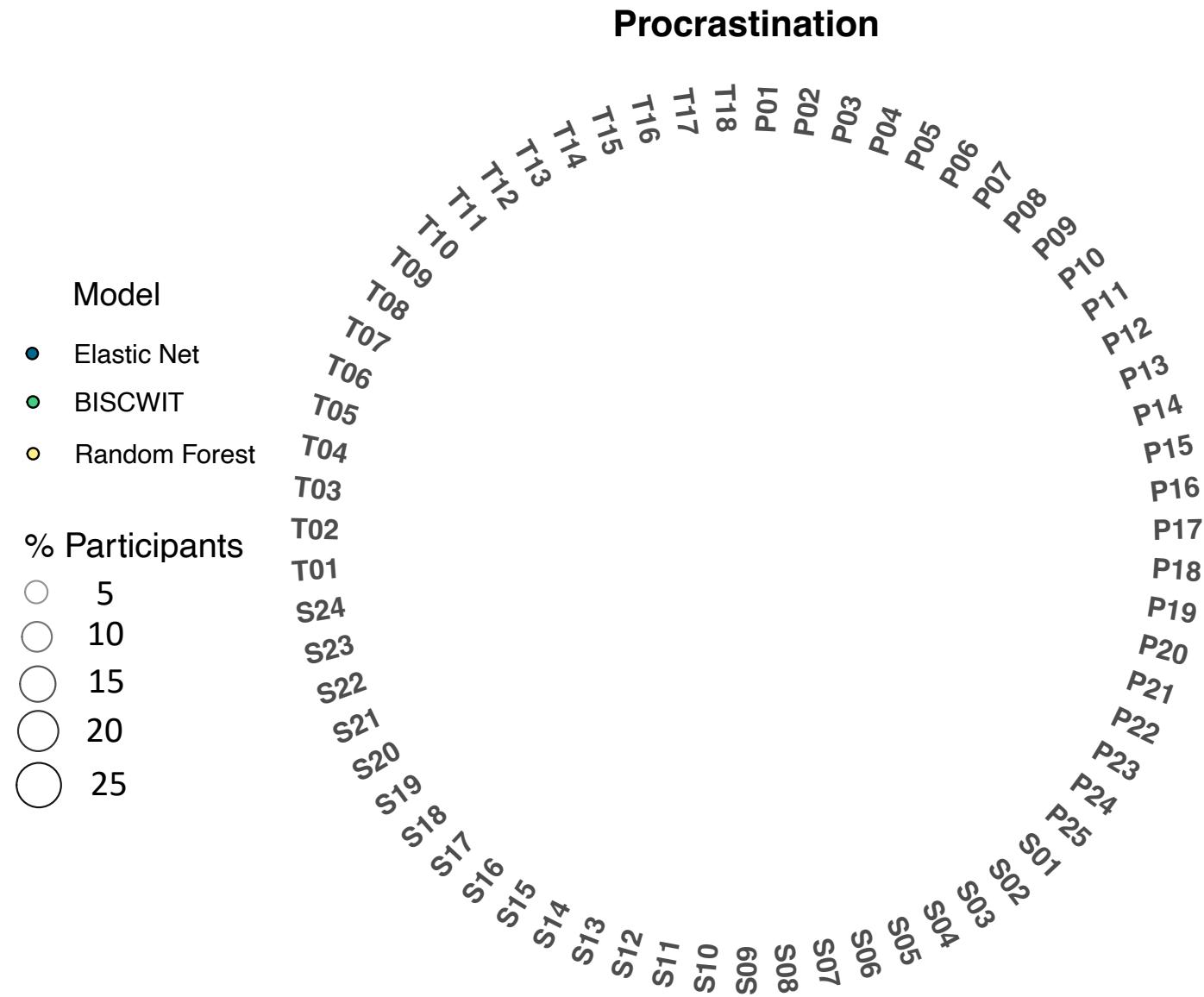
Elastic Net

The relative contribution of person, situation, and timing features varies across people.

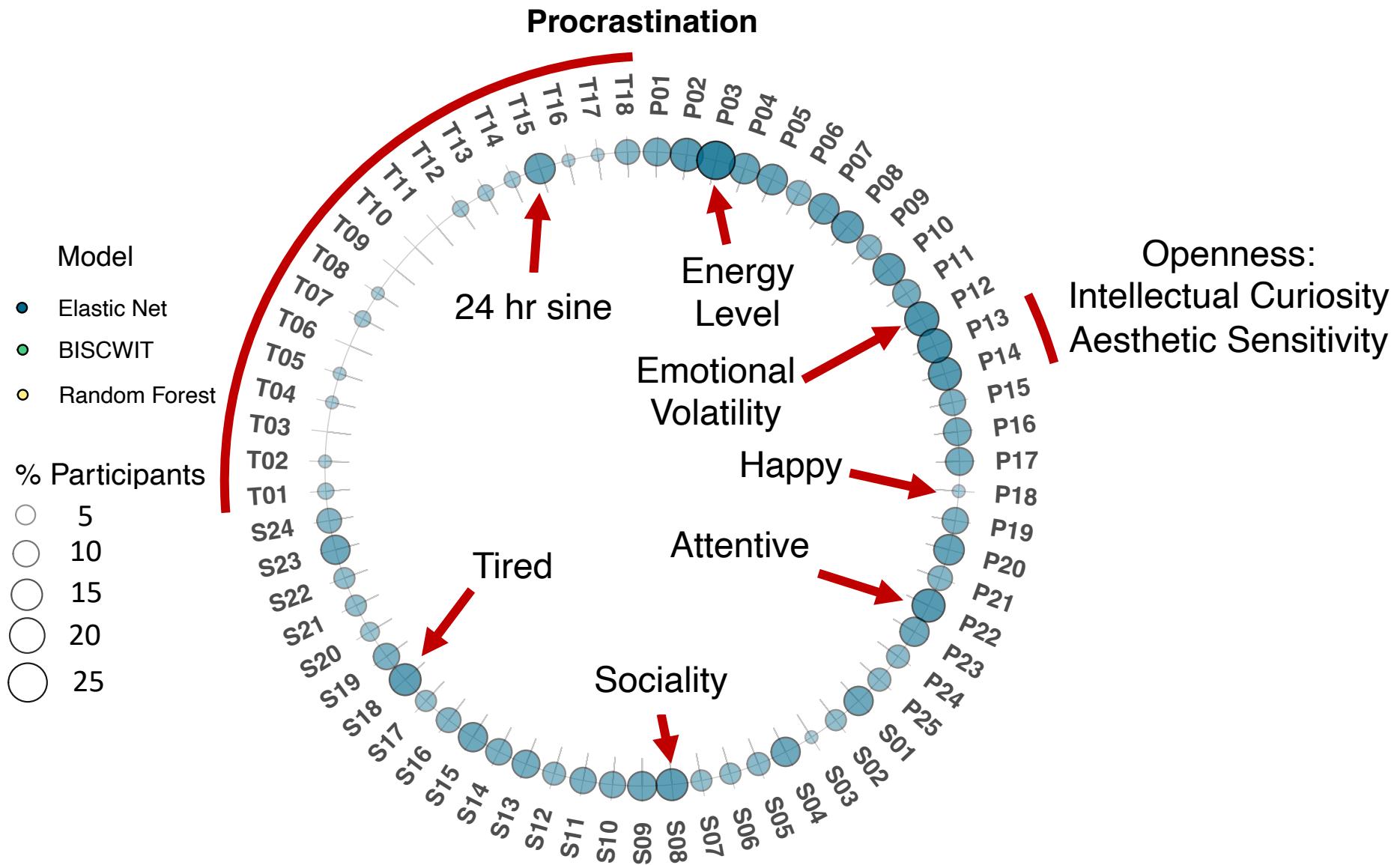


Which features play the strongest roles?

Which features play the strongest roles?



Which features play the strongest roles?



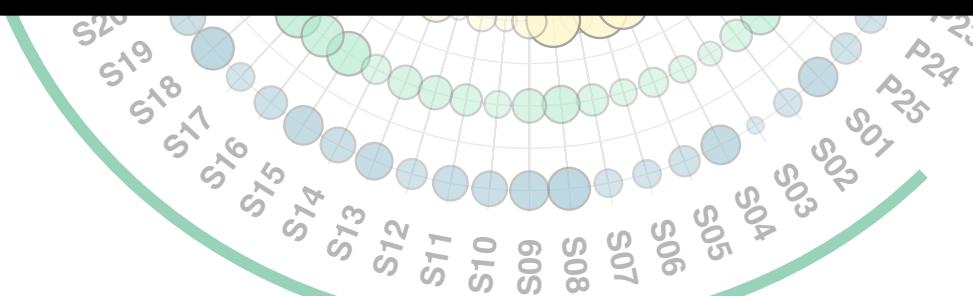
Which features play the strongest roles?

Procrastination

No one feature dominated the prediction of any outcome (max ~35%).

Behaviors & experiences have unique antecedents.

○ 25



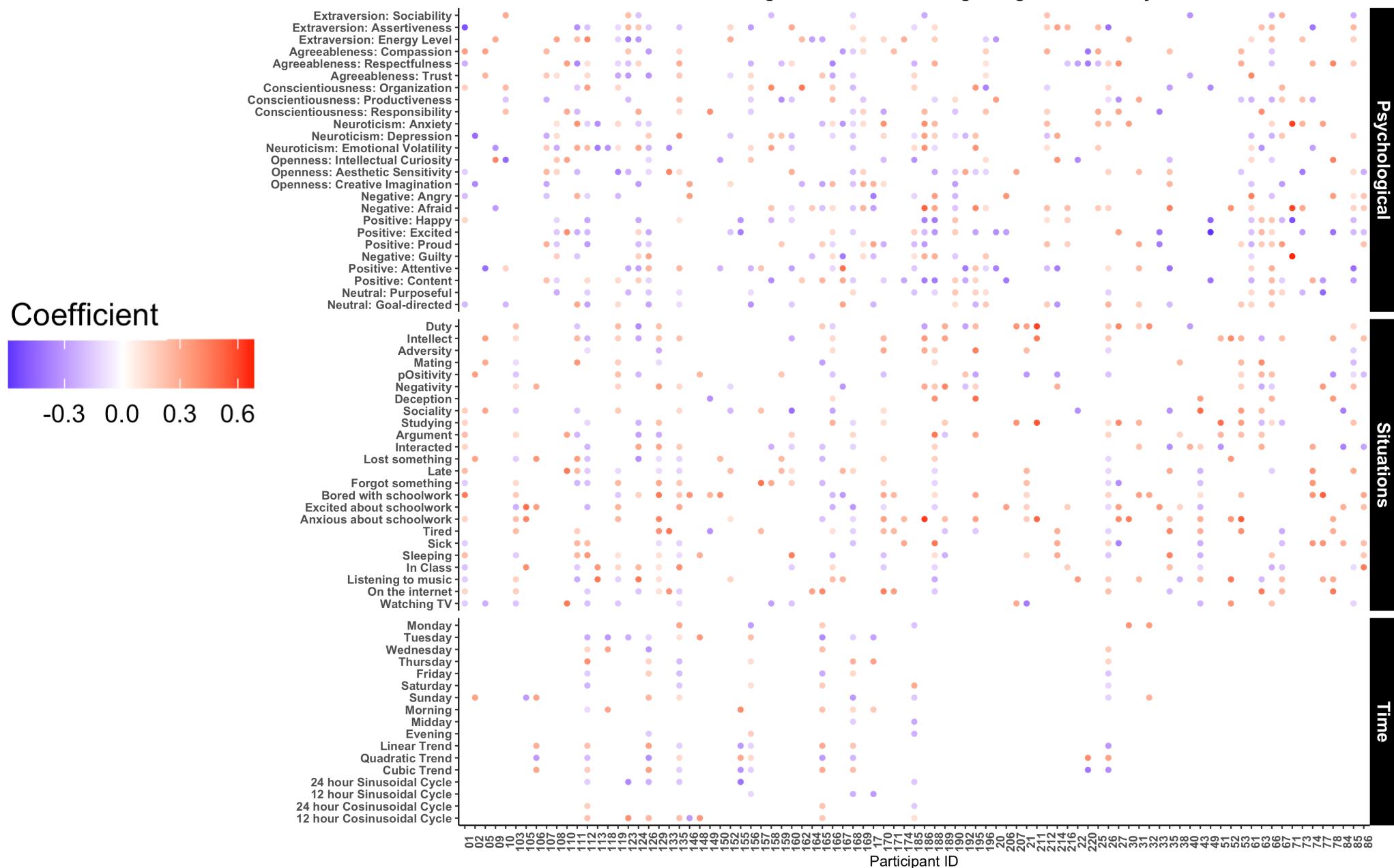
Aim 1: Individuals

Aim 2: Dynamics

Aim 3: Integration

Future Directions

BISCWIT Predicting Future Procrastinating Using Best Accuracy Models



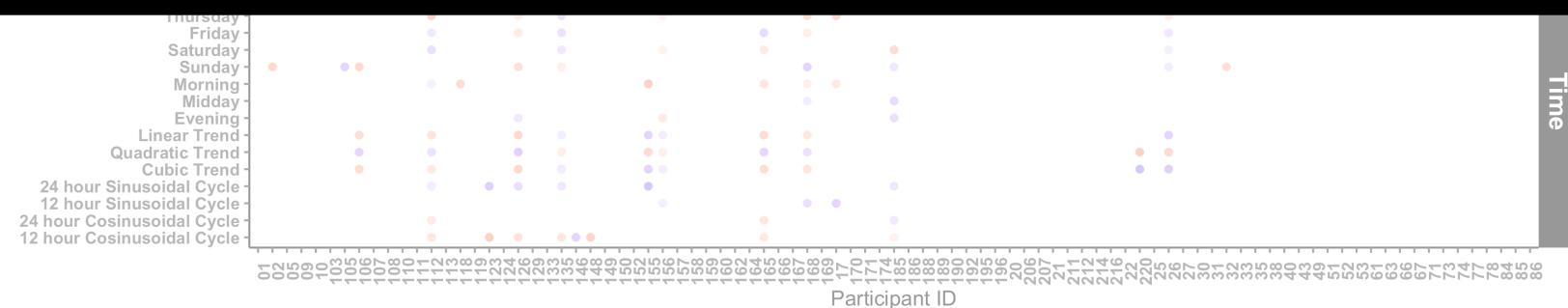
BISCWIT Predicting Future Procrastinating Using Best Accuracy Models



Coefficient



Individuals' profiles of antecedents differed in presence and direction.



Aim 1: Individuals show unique personality structures that are relatively consistent across time and events.

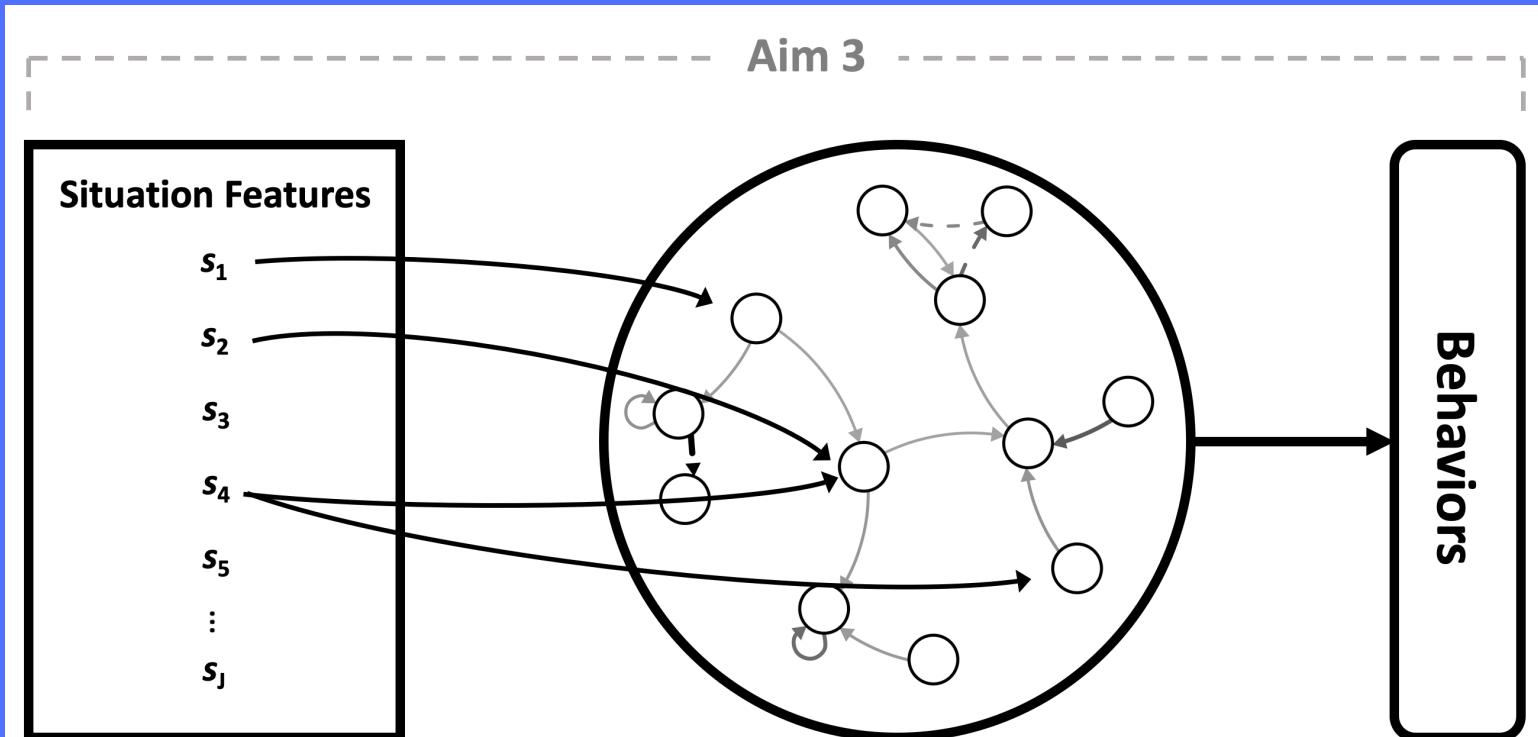
Beck & Jackson
(2020, *JPSP*; 2021b, *EJP*)

Aim 2: The dynamics of well-being unfold differently across people.

*Cheung, *Beck, et al.
(under review)

Aim 3: Predicting behavior using machine learning.

Beck & Jackson
(revision submitted, *Psych Science*)



* = shared first authorship.

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Aim 3: Predicting behavior using machine learning.

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(revision submitted, *Psych Science*)

The antecedents of behaviors and experiences:

Can be used to accurately predict those behaviors and experiences

Differ across people

Vary in the degree of psychological, situational, and timing antecedents

Aim 1: Individuals show unique personality structures that are relatively consistent across time and events.

Beck & Jackson
(2020, *JPSP*; 2021b, *EJP*)

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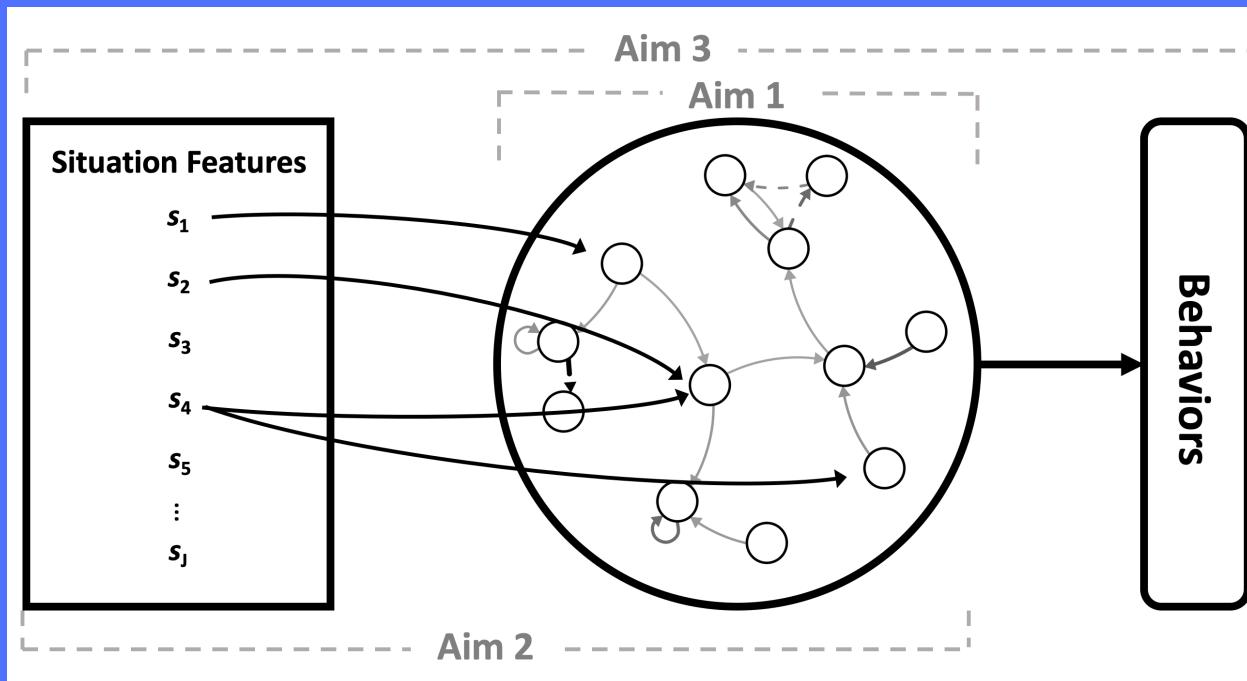
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Future Directions



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Ongoing and Future Directions

Integrating idiographic and between-person approaches

Applying idiographic methods to precision medicine and tailored interventions

Person-centered approaches to understanding lifespan development

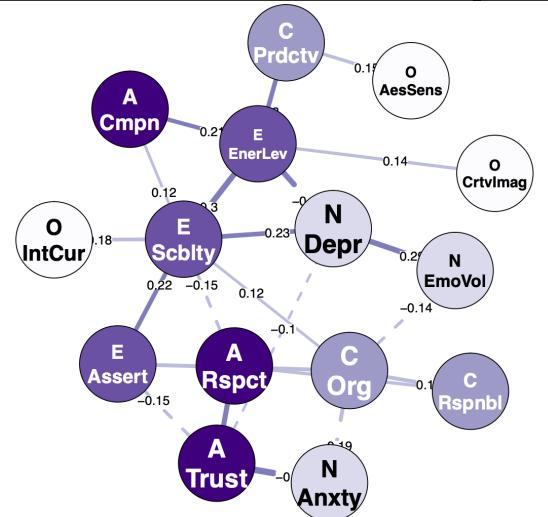
Ongoing and Future Directions

Integrating idiographic and between-person approaches

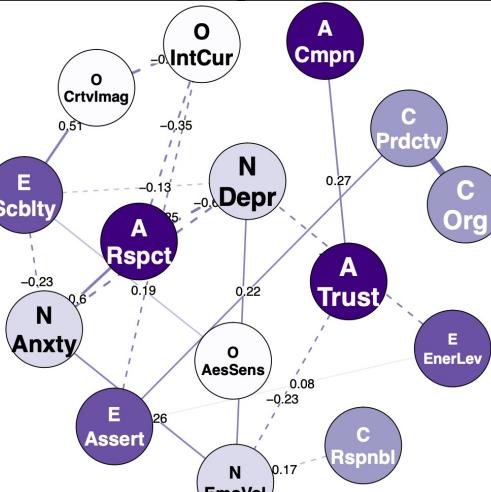
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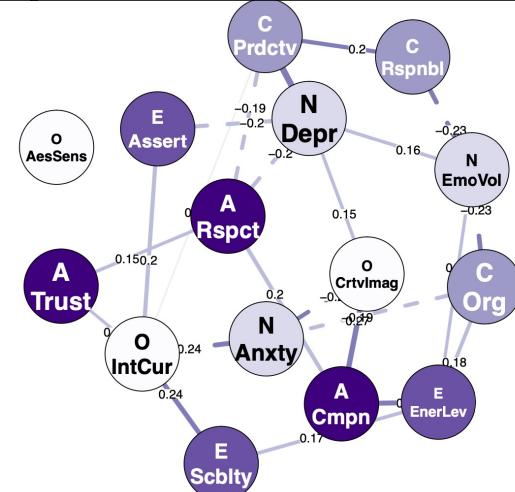
Aim 1: Individuals



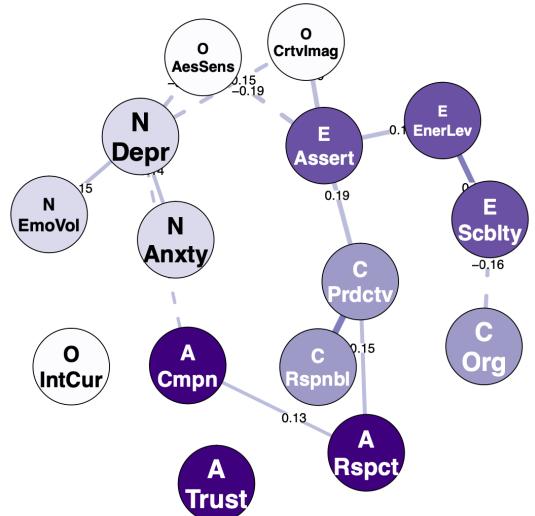
Aim 2: Dynamics



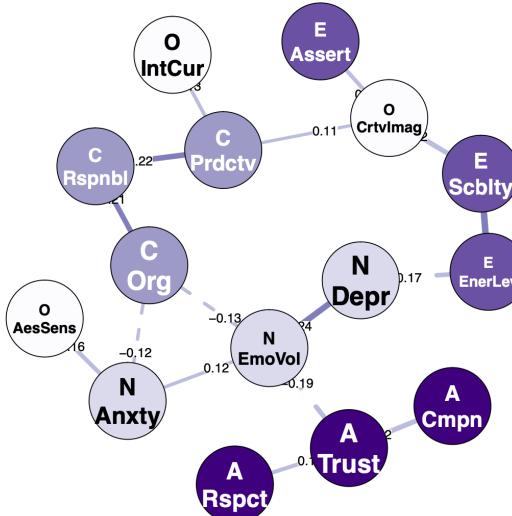
Aim 3: Integration



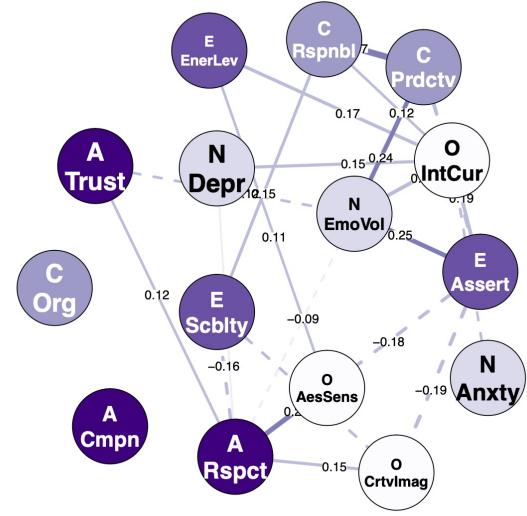
Wave 1: Contemporaneous for S16



Wave 1: Contemporaneous for S22



Wave 1: Contemporaneous for S29



Between-Person

Extraversion

Agreeableness

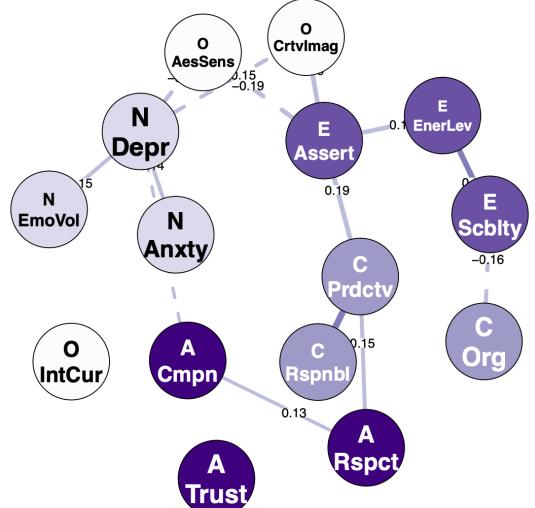
Conscientiousness

Neuroticism

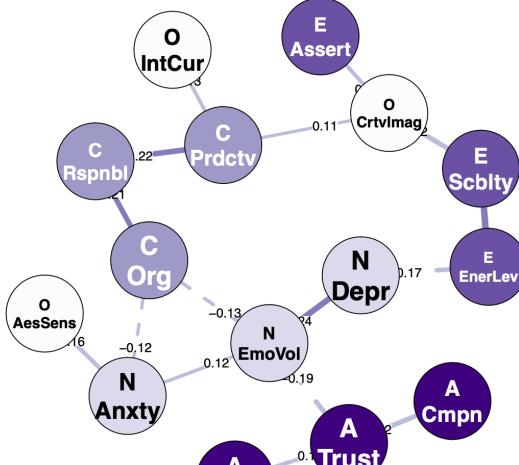
Openness



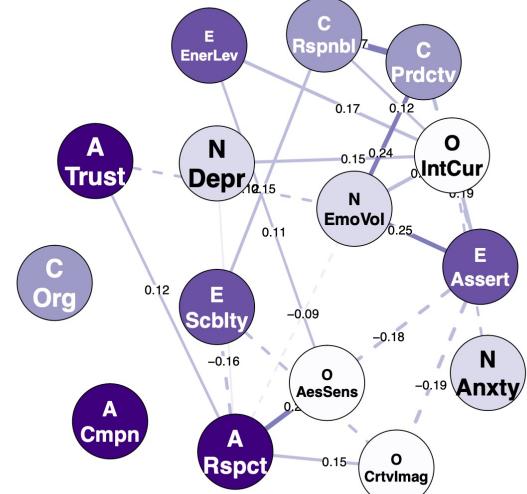
Wave 1: Contemporaneous for S16



Wave 1: Contemporaneous for S22



Wave 1: Contemporaneous for S29



Idiographic

A Planned Missing Alternative

Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Was outgoing, sociable.	Was compassionate, had a soft heart.	Was systematic, liked to keep things in order.	Was tense.	Was curious about many different things.
Was talkative.	Was helpful and unselfish with others.	Kept things neat and tidy.	Worried a lot.	Was complex, a deep thinker.
Tended to be quiet.	Felt little sympathy for others.	Tended to be disorganized.	Was relaxed, handled stress well.	Avoided intellectual, philosophical discussions.
Was sometimes shy, introverted.	Was cold and uncaring.	Left a mess, didn't clean up.	Rarely felt anxious or afraid.	Had little interest in abstract ideas.
Had an assertive personality.	Was respectful, treated others with respect.	Was efficient, got things done.	Often felt sad.	Was fascinated by art, music, or literature.
Was dominant, acted as a leader.	Was polite, courteous to others.	Was persistent, worked until the task was finished.	Tended to feel depressed, blue.	Valued art and beauty.
Found it hard to influence people.	Started arguments with others.	Tended to be lazy.	Stayed optimistic after experiencing a setback.	Had few artistic interests.
Preferred to have others take charge.	Was sometimes rude to others.	Had difficulty getting started on tasks.	Felt secure, comfortable with self.	Thought poetry and plays were boring.
Was full of energy.	Had a forgiving nature.	Was dependable, steady.	Was moody, had up and down mood swings.	Was inventive, found clever ways to do things.
Showed a lot of enthusiasm.	Assumed the best about people.	Was reliable, could always be counted on.	Was temperamental, got emotional easily.	Was original, came up with new ideas.
Rarely felt excited or eager.	Tended to find fault with others.	Was somewhat careless.	Was emotionally stable, not easily upset.	Had little creativity.
Was less active than other people.	Was suspicious of others' intentions.	Sometimes behaved irresponsibly.	Kept their emotions under control.	Had difficulty imagining things.

Linking the Idiographic to the Nomothetic

Between-Person

R-technique
(between-person)
Factor Analysis

Between-Person
Dynamic
Exploratory Graph
Analysis

Between-Person
Bayesian IRT

Multi-level
factor analysis

Idiographic

P-technique
(idiographic)
Factor Analysis

Idiographic
Dynamic
Exploratory Graph
Analysis

Idiographic
Bayesian IRT

Ongoing and Future Directions

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Precision Medicine

Targeting

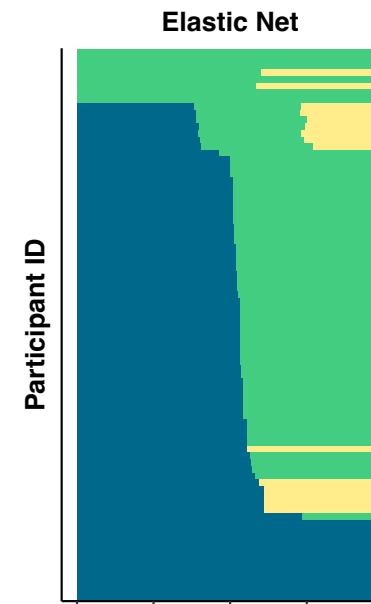
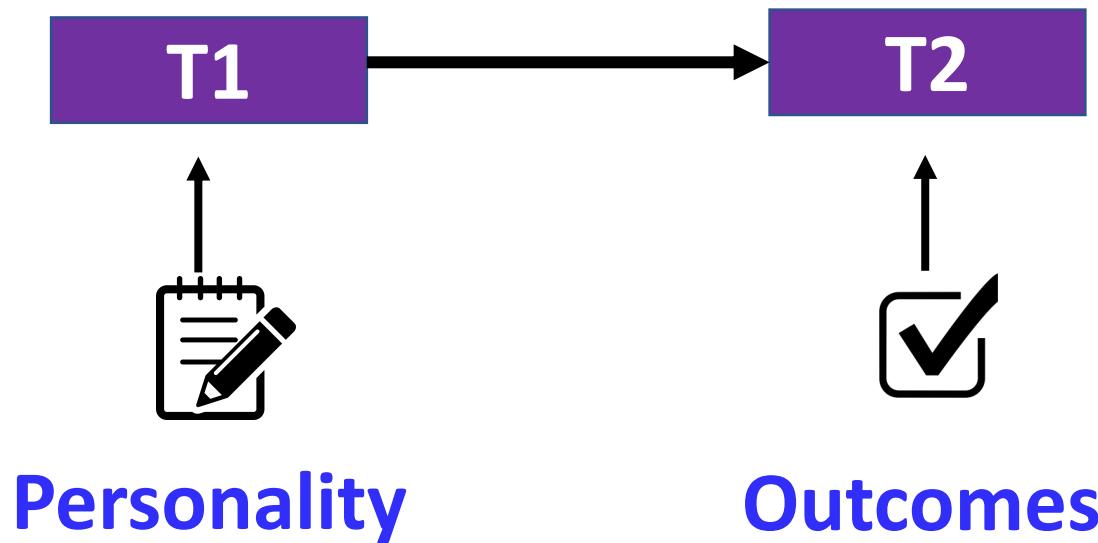
Traits predict long-term outcomes

(Beck & Jackson, 2021a, *JPSP*)

Tailoring

Psychological and situational phenomena
predict behaviors differently across
people.

(Beck & Jackson, revision submitted, *Psych Science*)



Precision Medicine

Targeting

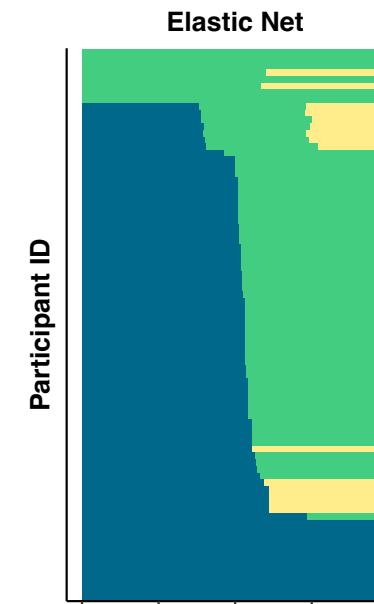
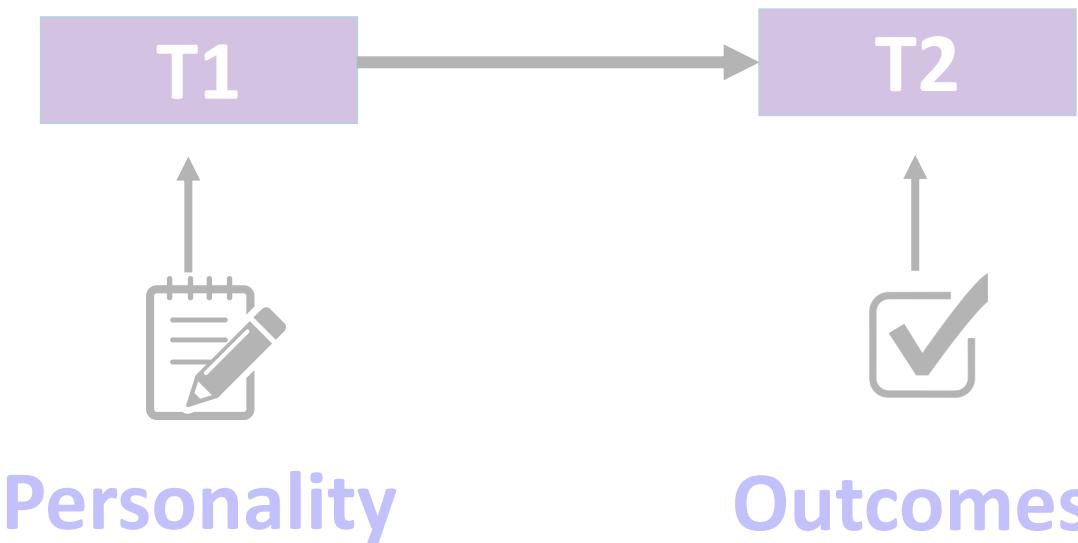
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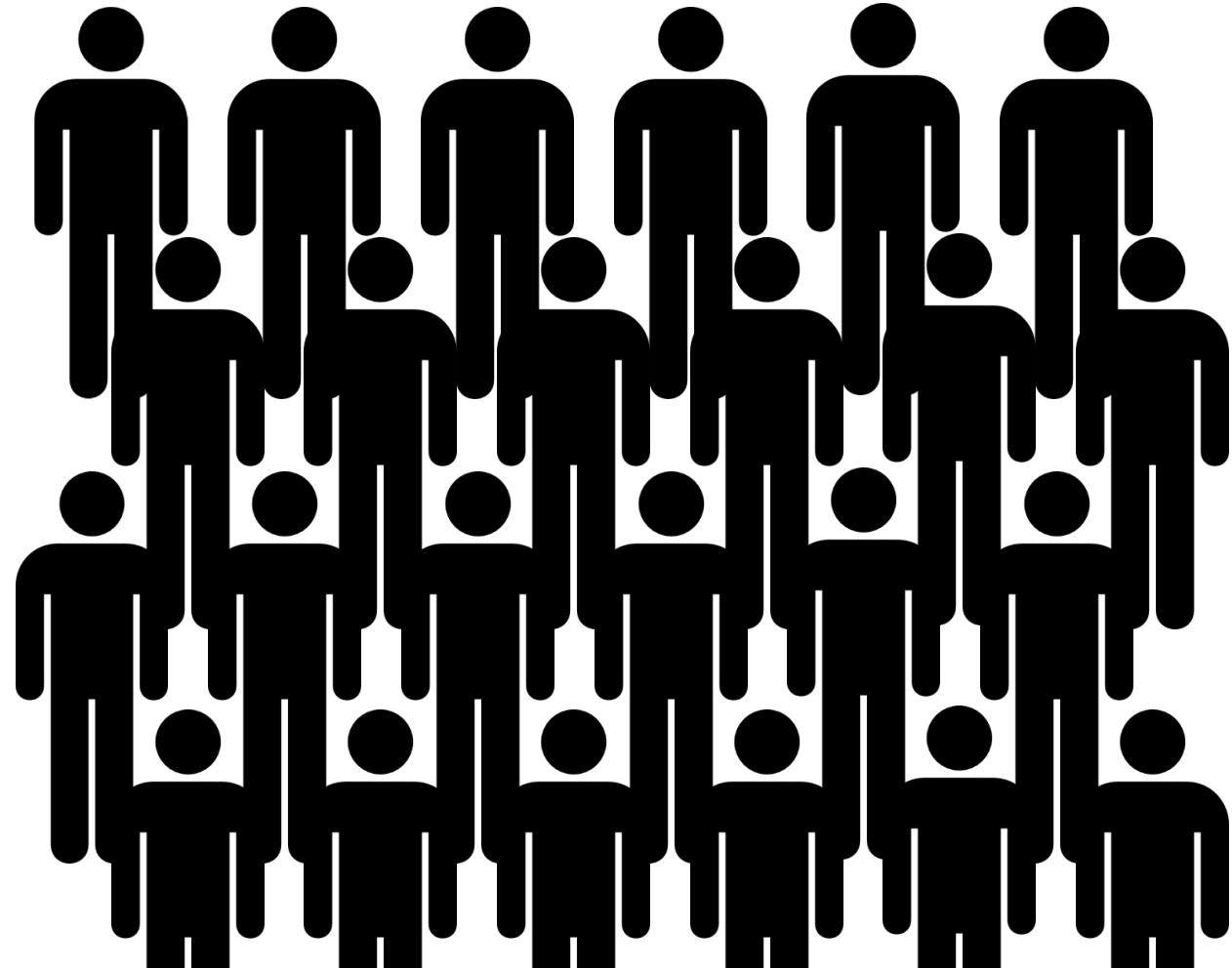
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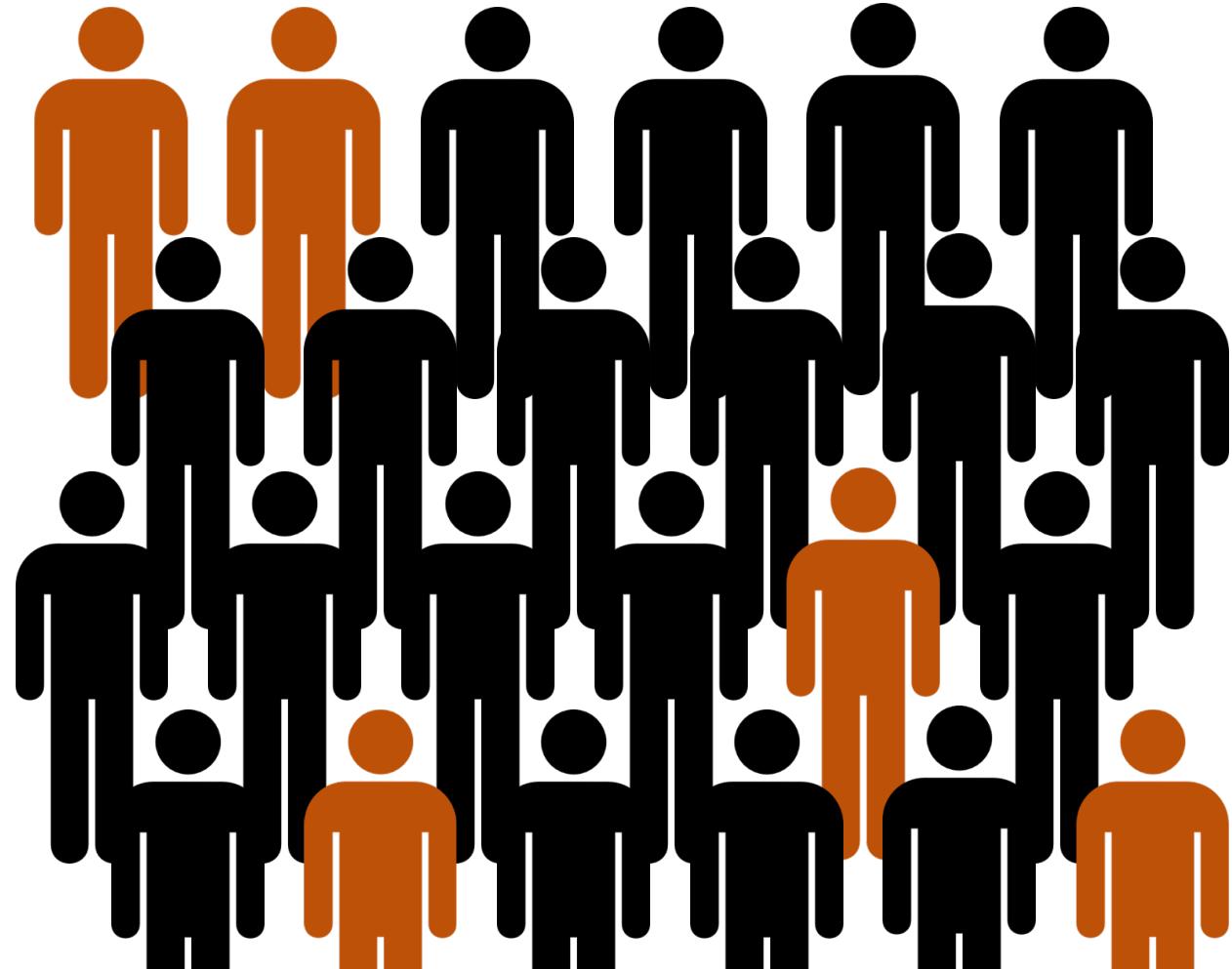


Tailoring: Identifying antecedents & providing personalized solutions



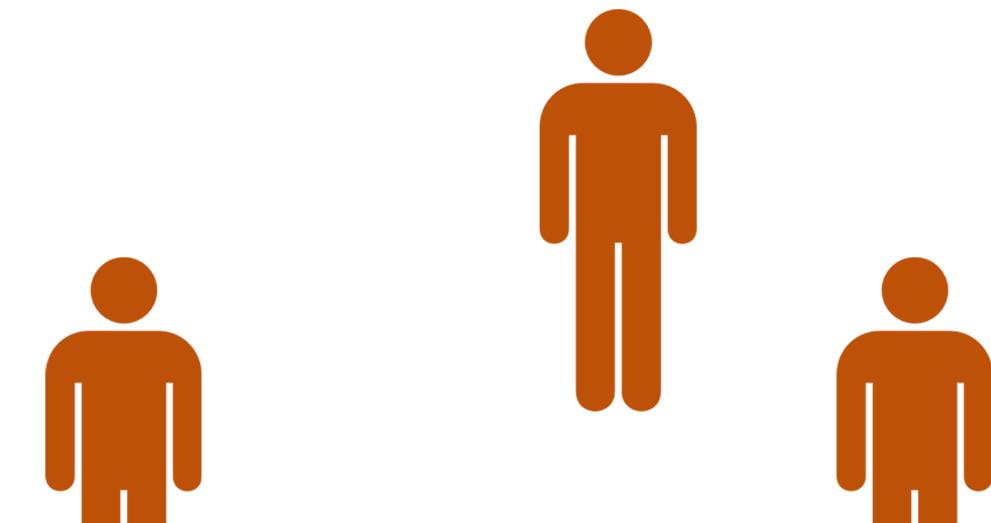
Dementia Diagnosis

Tailoring: Identifying antecedents & providing personalized solutions



Dementia Diagnosis

Tailoring: Identifying antecedents & providing personalized solutions



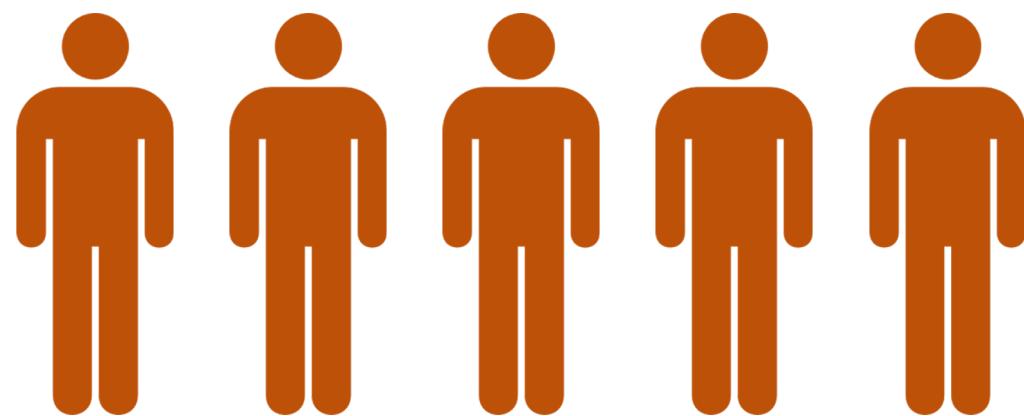
Dementia Diagnosis

Tailoring:

Identifying antecedents & providing
personalized solutions



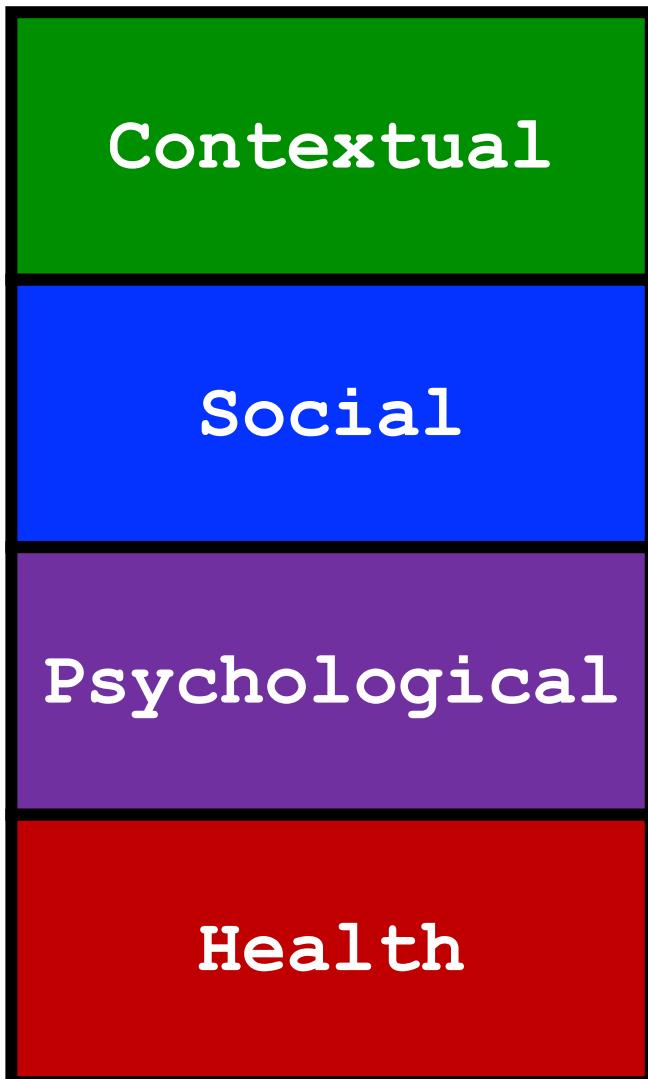
Cognitive
Functioning



Dementia Diagnosis

Tailoring:

Identifying antecedents & providing personalized solutions



Cognitive
Functioning



Dementia Diagnosis

Tailoring:

Identifying antecedents & providing personalized solutions



- Interacting with others (+)
- Arguments (-)

Cognitive Functioning



Dementia Diagnosis

Tailoring:

Identifying antecedents & providing personalized solutions



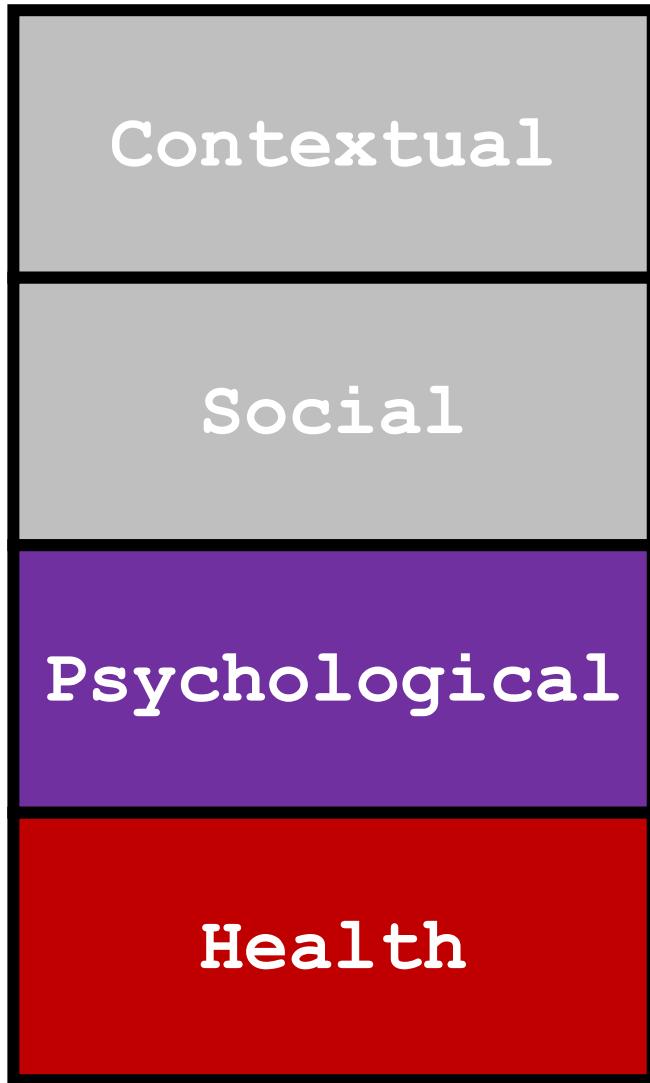
Cognitive
Functioning



Dementia Diagnosis

Tailoring:

Identifying antecedents & providing personalized solutions



Cognitive Functioning



- Anxiety (-)
- Excitement (+)
- Smoking (-)
- Exercise (+)

Dementia Diagnosis

Ongoing and Future Directions

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Evidence for personality change

The Big Five and other personality traits show normative patterns of change.

(e.g., Roberts et al., 2006; Graham et al., 2019)

WHY?

Idiographic personality is consistent across years and global events (i.e. COVID-19)

(Beck & Jackson, 2020, *JPSP*; 2021, *EJP*)

Life Events?

Life events rarely predict between-person change when correcting for selection bias.

(e.g., Bollich, Beck et al., *JPSP*; Hill, Beck, & Jackson, *JG:SB*)

Life events were unassociated with empirically detected idiographic change points.

(Beck & Jackson, 2021, *JPA*)

Next Steps in Studying Change

Measurement

Ensuring measures are optimized to detect change

Longitudinal Designs

Longitudinal burst designs to for short- and long-term change

Experimental Designs

Tailored interventions

Qualitative Methods: Folk Theories of Change

Open ended surveys and narrative methods (How do understand change?)

Statistical Models

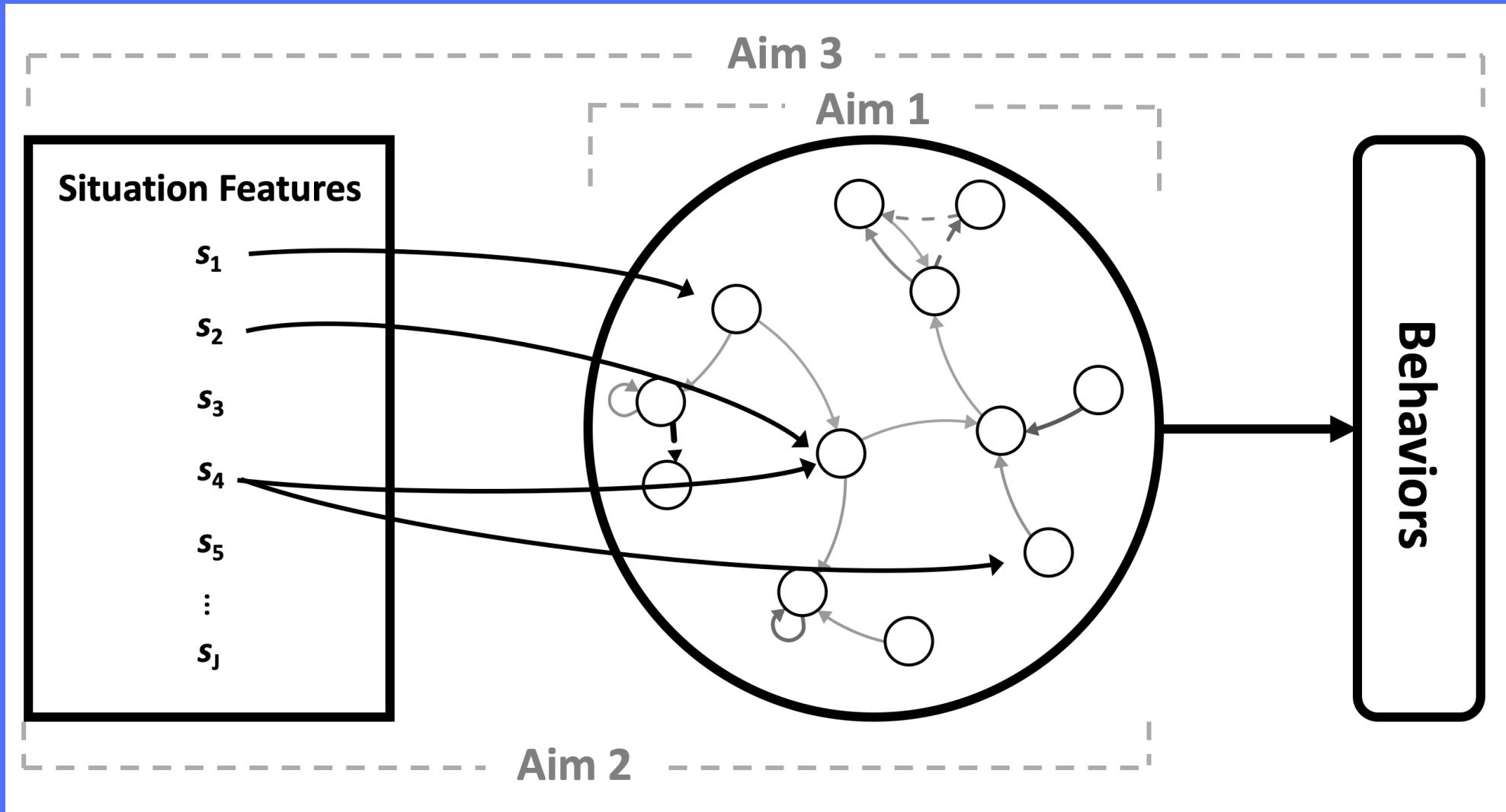
Examining changing dynamics, not just changing levels

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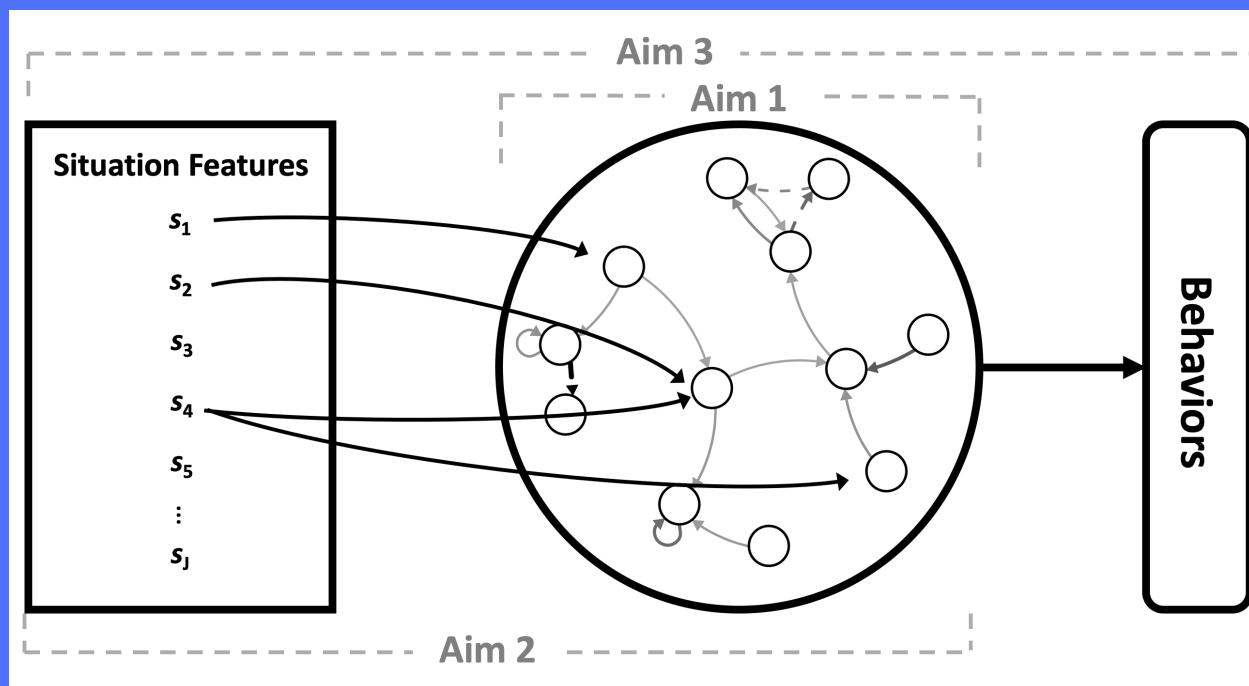
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Future Directions



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Acknowledgements

Collaborators

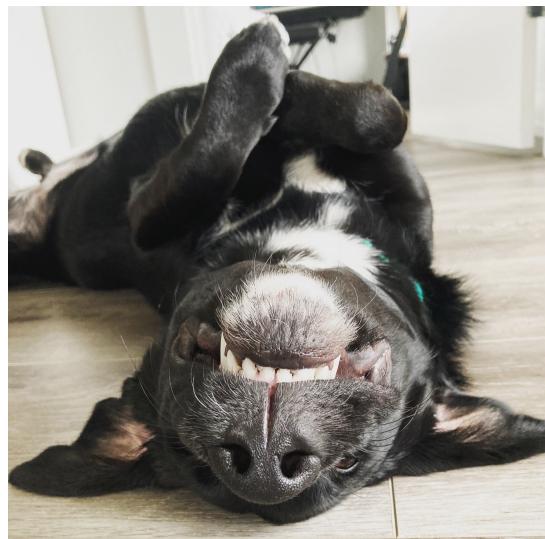
Josh Jackson
Alex Christensen
Patrick Hill
David Condon
David Clark
Felix Cheung
Stuti Thapa
Dan Mroczek
Eileen Graham

Analytic Tools

WUSTL & Northwestern
Centers for High
Performance Computing

Current / Former Lab

Josh Jackson Dan Mroczek
AJ Wright Eileen Graham
Leah Schultz Emily Willroth
Abby Rodler Olivia Atherton
Dante Chao Jing Luo
Rachel Best
Jessie Rich



Data Sources

BHPS (and US)	OCTO-TWIN
GSOEP	WUSM-MAP
HILDA	EAS
HRS	ROS
LISS	MAP
MIDUS	MARS
NLSY	LASA
SHP	BASE-I
WLS (G&S)	BASE-II
SATSA	SHARE