

Trailblazer Award Presentation: My Trail Guides

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Chief, Psychology Service, VA San Diego Healthcare System*

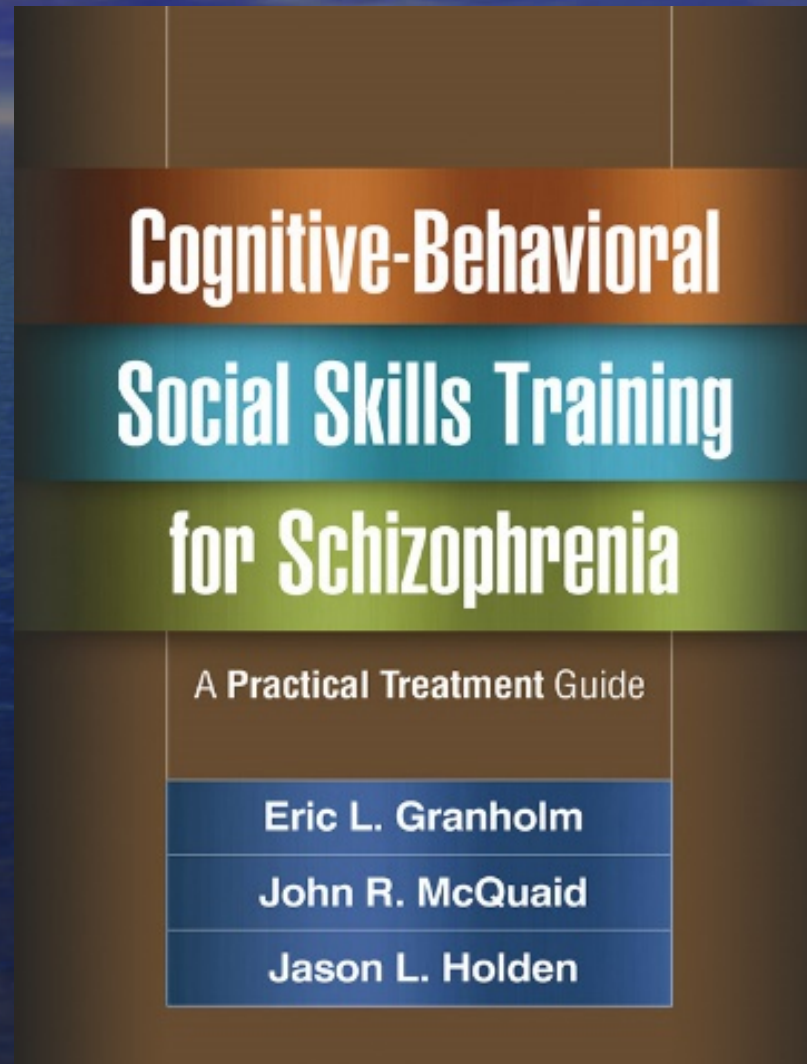


Past Trailblazer Award Recipients

- Steven Silverstein
- Keith Nuechterlein
- Nathan Azrin
- Robert Drake
- William Spaulding
- Kim Mueser
- Nicolas Terrier
- Gordon Paul
- Robert Liberman
- Allan Bellack

Conflict of Interest

(actually, egregious book plug)



Available from Guilford Press table in showroom

Overview: 3 Trails Blazed

- Pupillometry as an objective “biomarker” of effort and motivation
- CBSST for negative symptoms and social recovery
- Ecological Momentary Assessment and Intervention (EMA/EMI)

Nelson Butters



Clinical v. Basic
Science

Application of
cognitive/experimental
psychology to clinical



Recall v. Recognition & Semantic v. Phonemic Fluency in AD, HD, PD and Korsakoff's

- **Cited by 618:** Butters, N., Granholm, E., Salmon, D. P., Grant, I. & Wolfe, J. (1987). Episodic and semantic memory: A comparison of amnesic and demented patients. JCEN, 9(5), 479-491.
- **Cited by 313:** Butters, N., Wolfe, J., Granholm, E. & Martone, M. (1986). An assessment of verbal recall, recognition and fluency abilities in patients with Huntington's Disease. Cortex, 22(1), 11-32.
- **Cite by 122:** Granholm, E., & Butters, N. (1987). Encoding specificity in Huntington's Disease (HD) and Dementia of the Alzheimer's Type (DAT). JCEN, 9(1), 15.

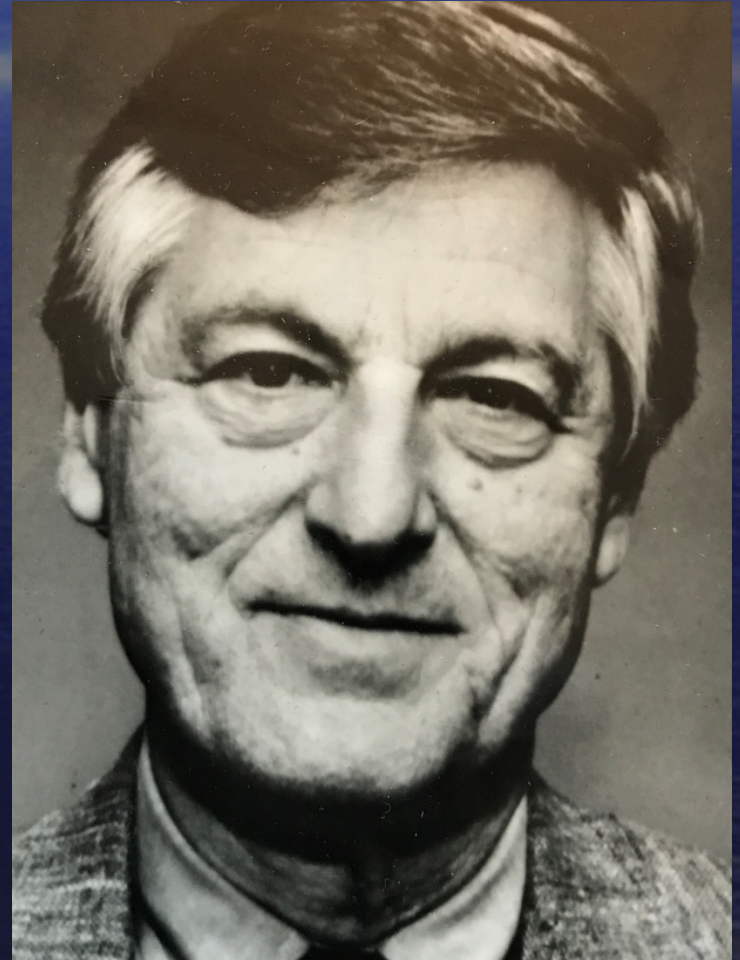
Dissertation Committee



Dissertation Co-Chairs: Bob Asarnow & Mike Goldstein

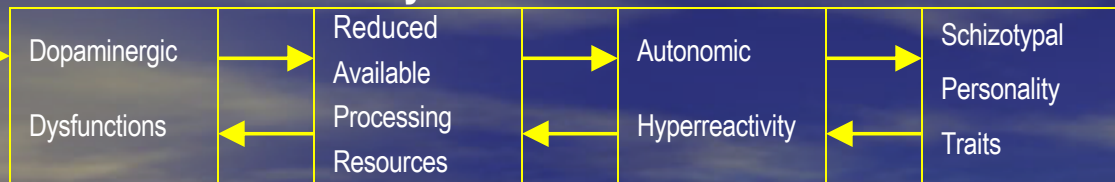


Cognitive Psychology & Pupillometry

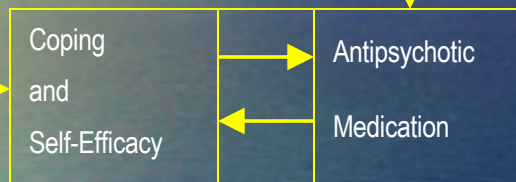


Family Therapy & Big Picture Outcomes

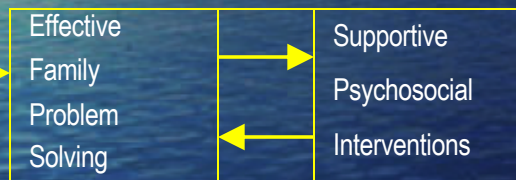
Personal Vulnerability Factors



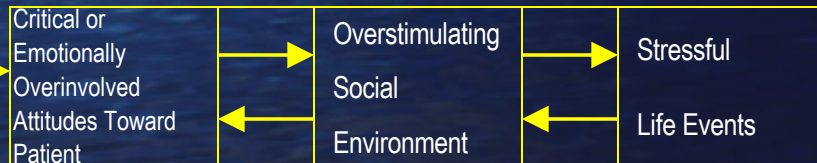
Personal Protectors



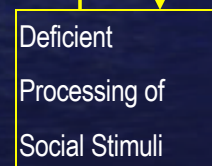
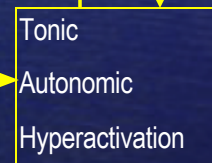
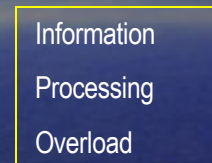
Environmental Protectors



Environmental Potentiators & Stressors



Intermediate States



Interaction

Prodromal Symptoms

Outcomes

Social Functioning

Schizophrenic Psychotic Symptoms

Occupational Functioning

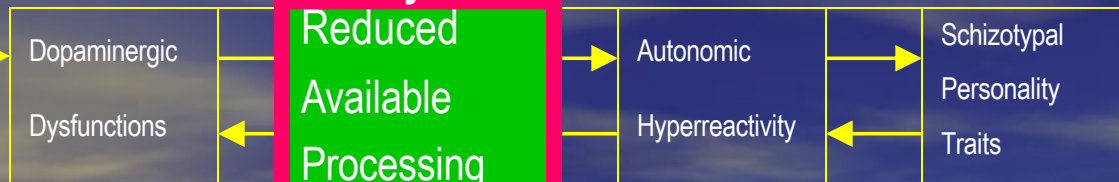
Feedback Loop

Remission Period

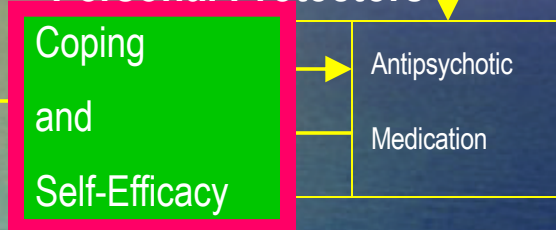
Prodromal Period

Episode

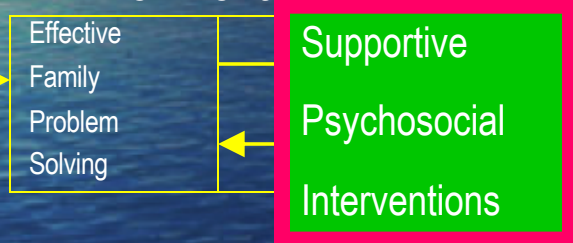
Personal Vulnerability Factors



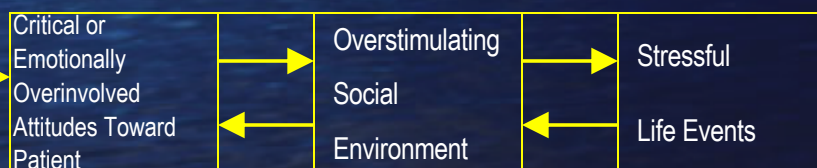
Personal Protectors



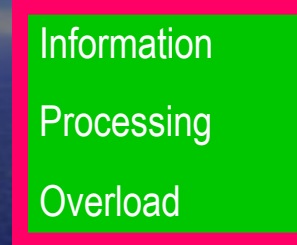
Environmental Protectors



Environmental Potentiators & Stressors



Intermediate States



Interaction

Tonic Autonomic Hyperactivation

Deficient Processing of Social Stimuli

Prodromal Symptoms

Outcomes

Social Functioning

Schizophrenic Psychotic Symptoms

Occupational Functioning

Feedback Loop

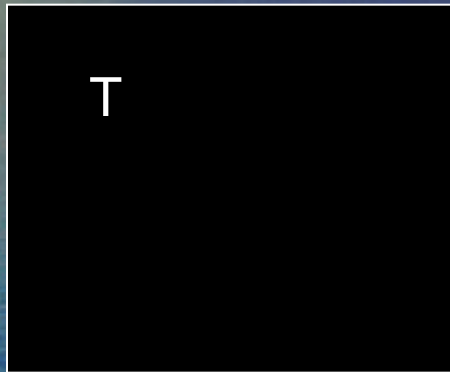
Remission Period

Prodromal Period

Episode

SPAN OF APPREHENSION (SOA) TASK

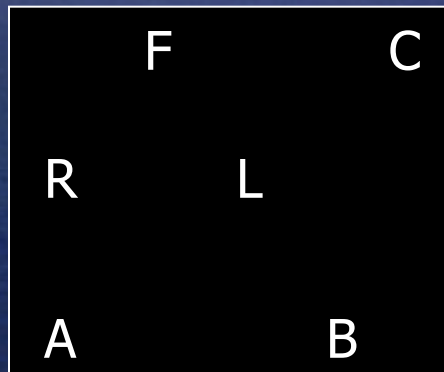
1-Letter Array



70ms



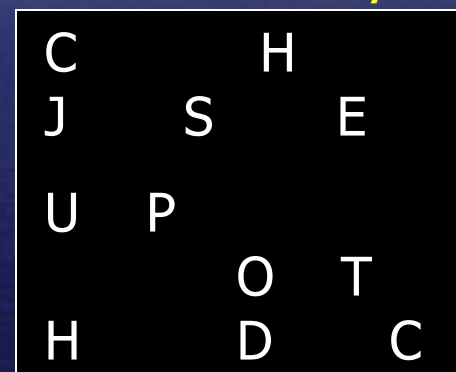
6-Letter Array



70ms



12-Letter Array



70ms





K

F

A



X

E

W

M

Y

A

D

S

O

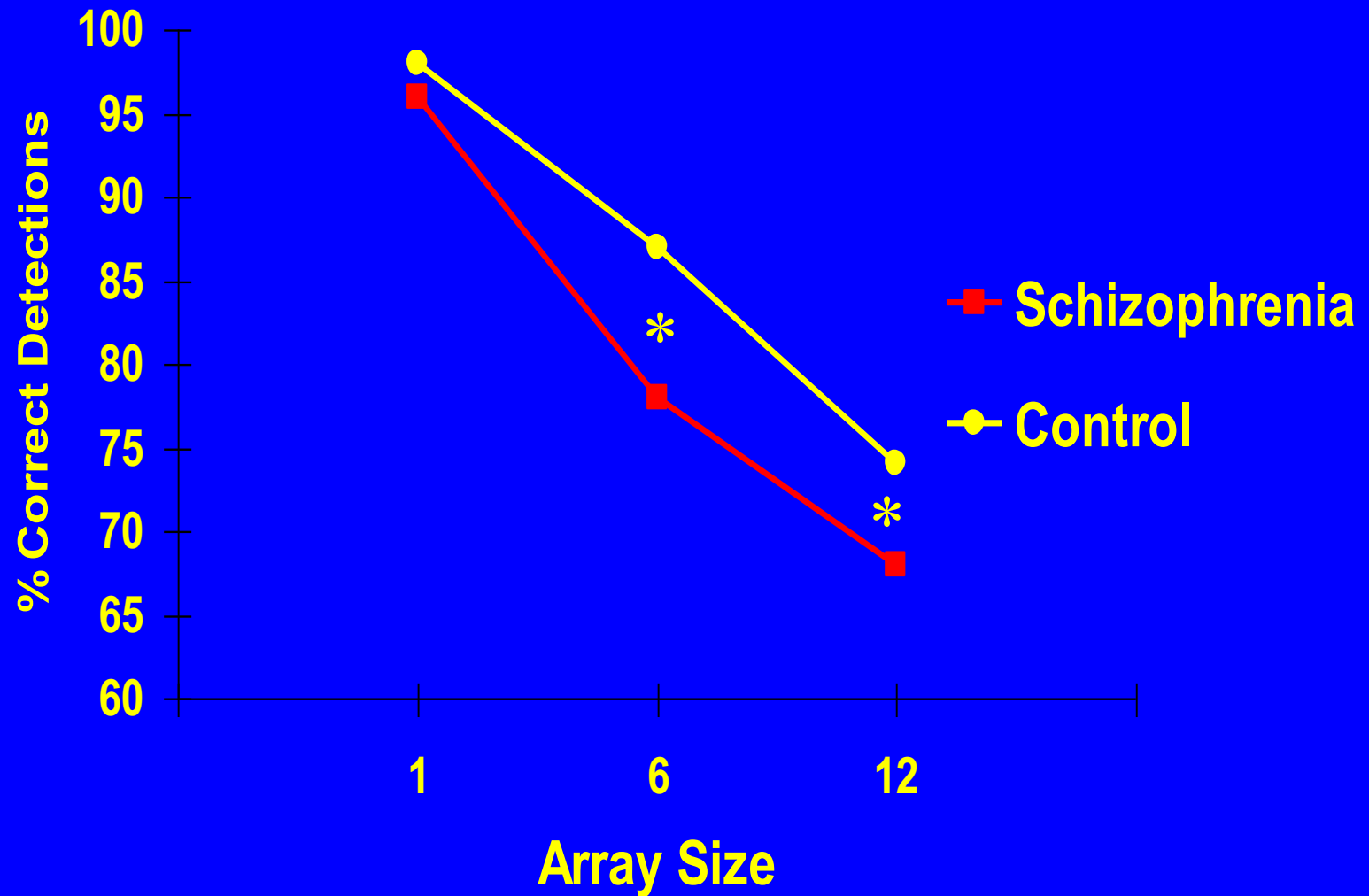
T

H

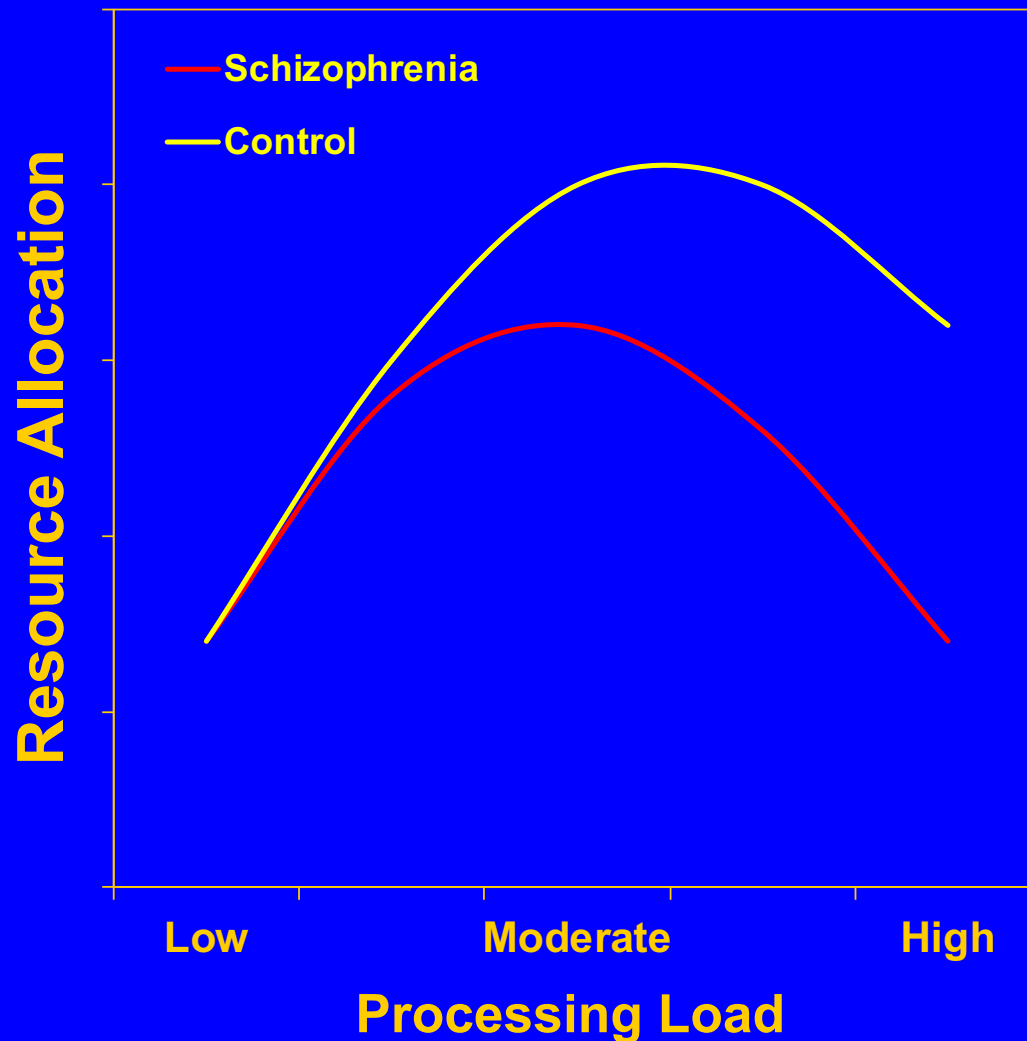
L



SOA Task Detection Accuracy



Resource Limitations Hypothesis



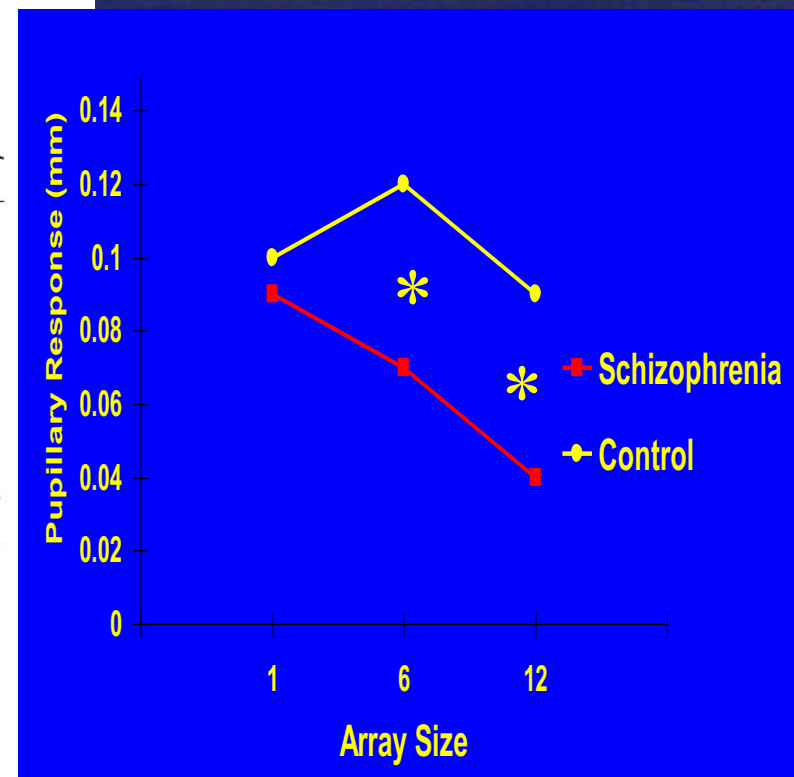
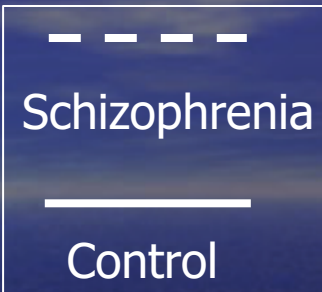
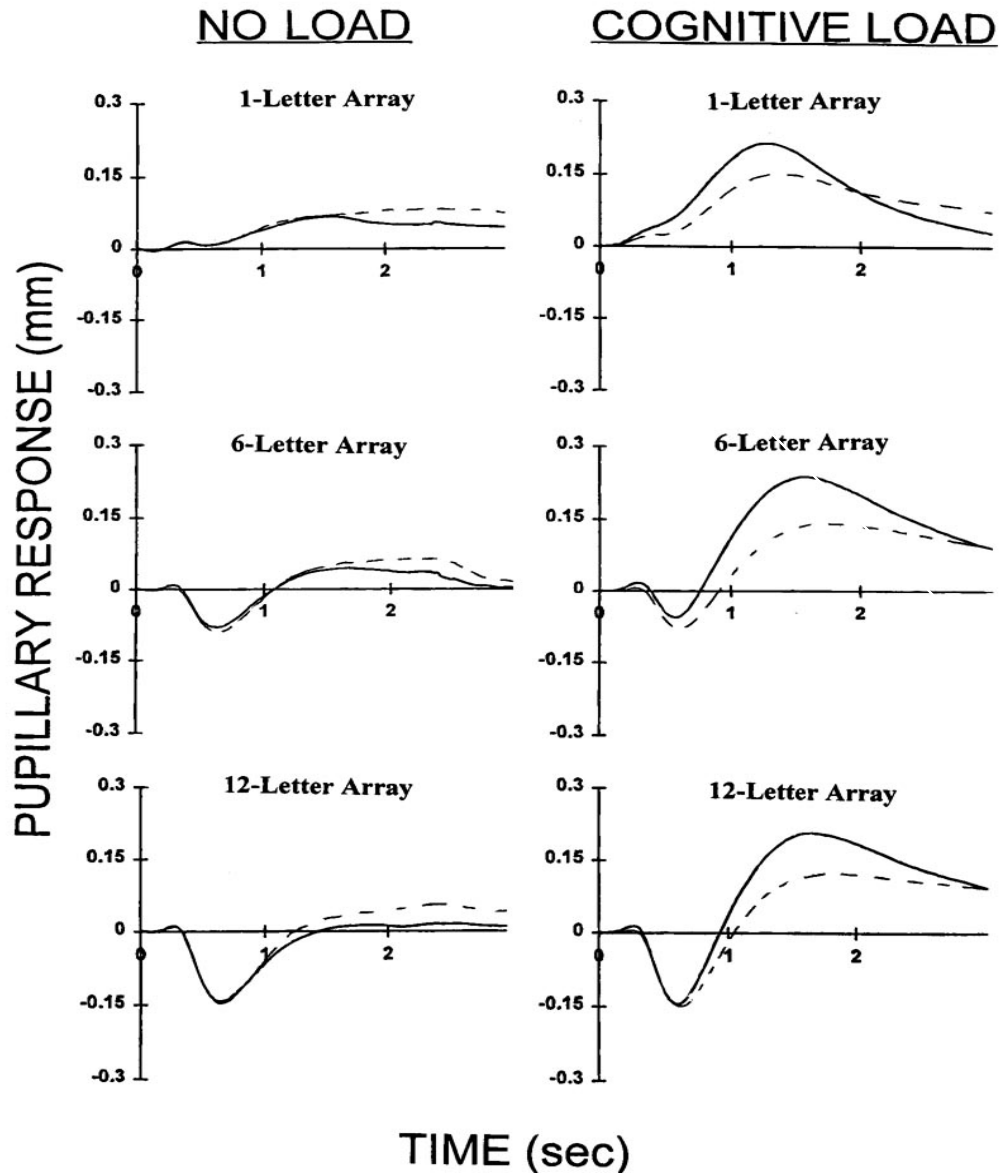
Pupillometry



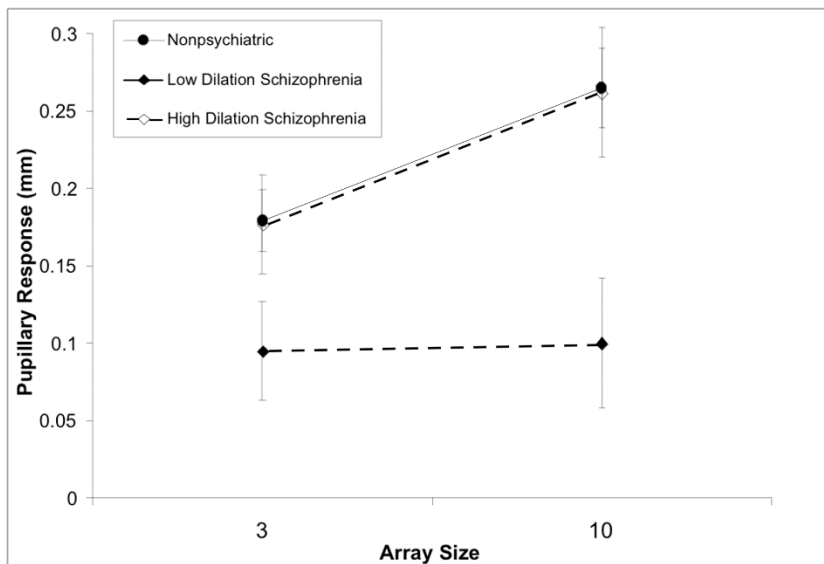
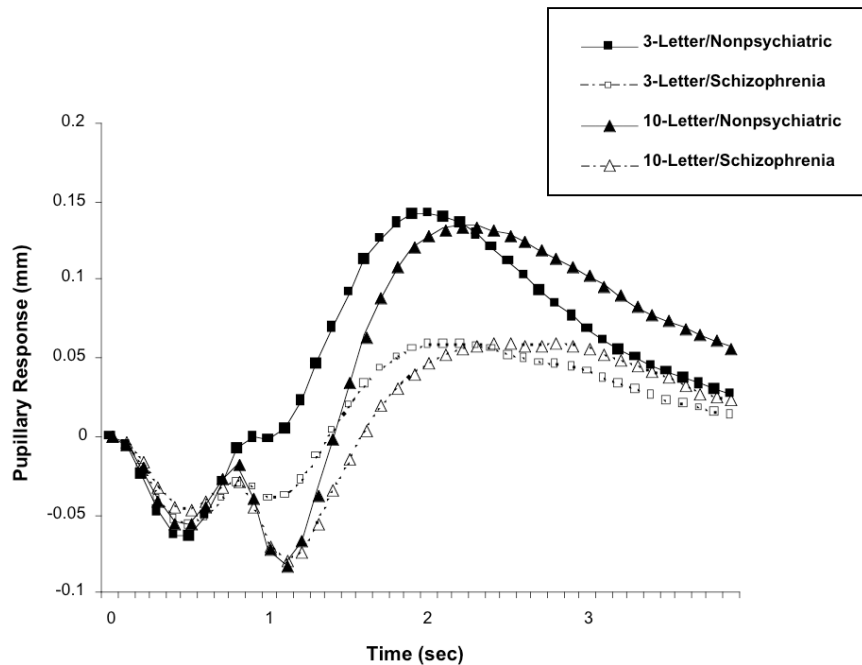
Historical Pupillometer



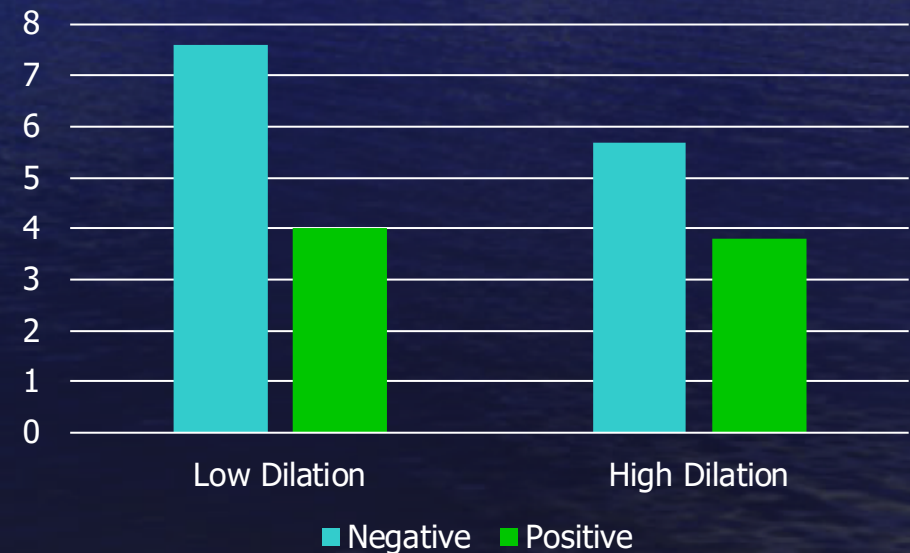
SOA Task Pupillary Responses



SOA Task Pupillary Responses and Negative Symptoms



PANSS Symptom Severity



Correlation between 10-letter and negative symptoms: $r = .32$, $p = .015$

Pupillometry Summary

- Pupillary responses during cognitive tasks provide a “biomarker” of resource allocation or cognitive effort
- More severe negative symptoms are associated with diminished effort especially when task difficulty increases
- Challenge is determining whether participants “can’t or won’t” allocate (capacity limits v. motivation)

Psychotherapy Clinical Trials

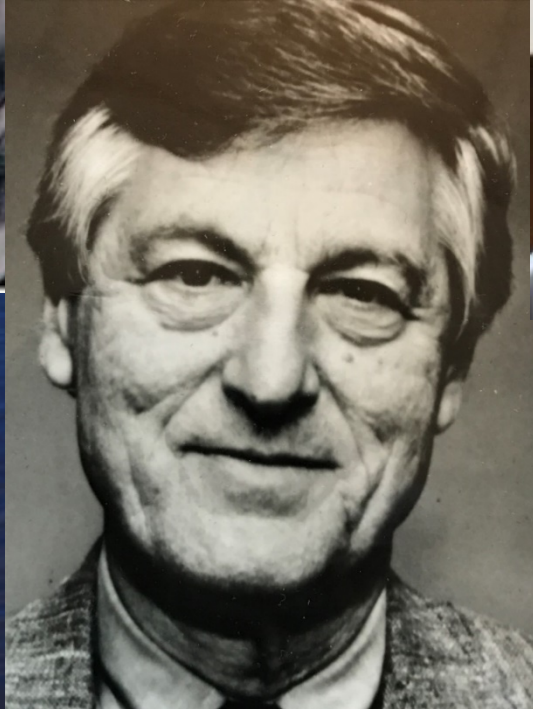
Bob Liberman



John McQuaid



Mike Goldstein



Aaron Beck



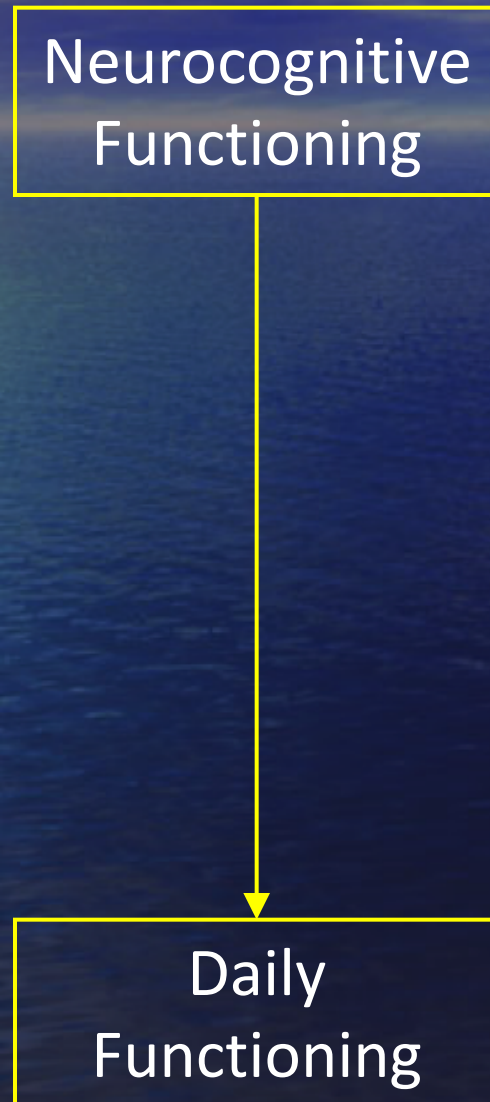
CBT+SST=CBSST

Why add CBT to SST?

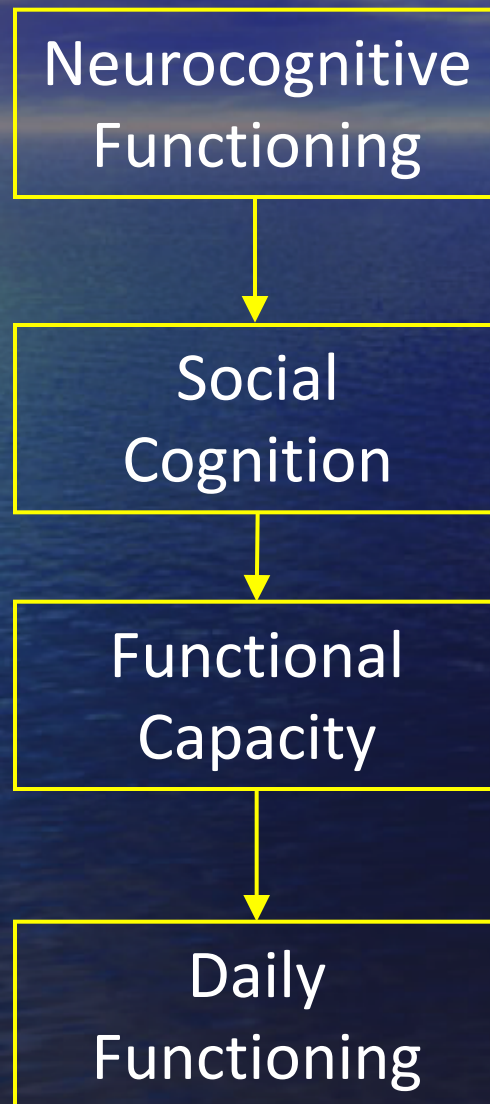
Sometimes people have the skills but don't use them.

This is often because a thought is in the way.

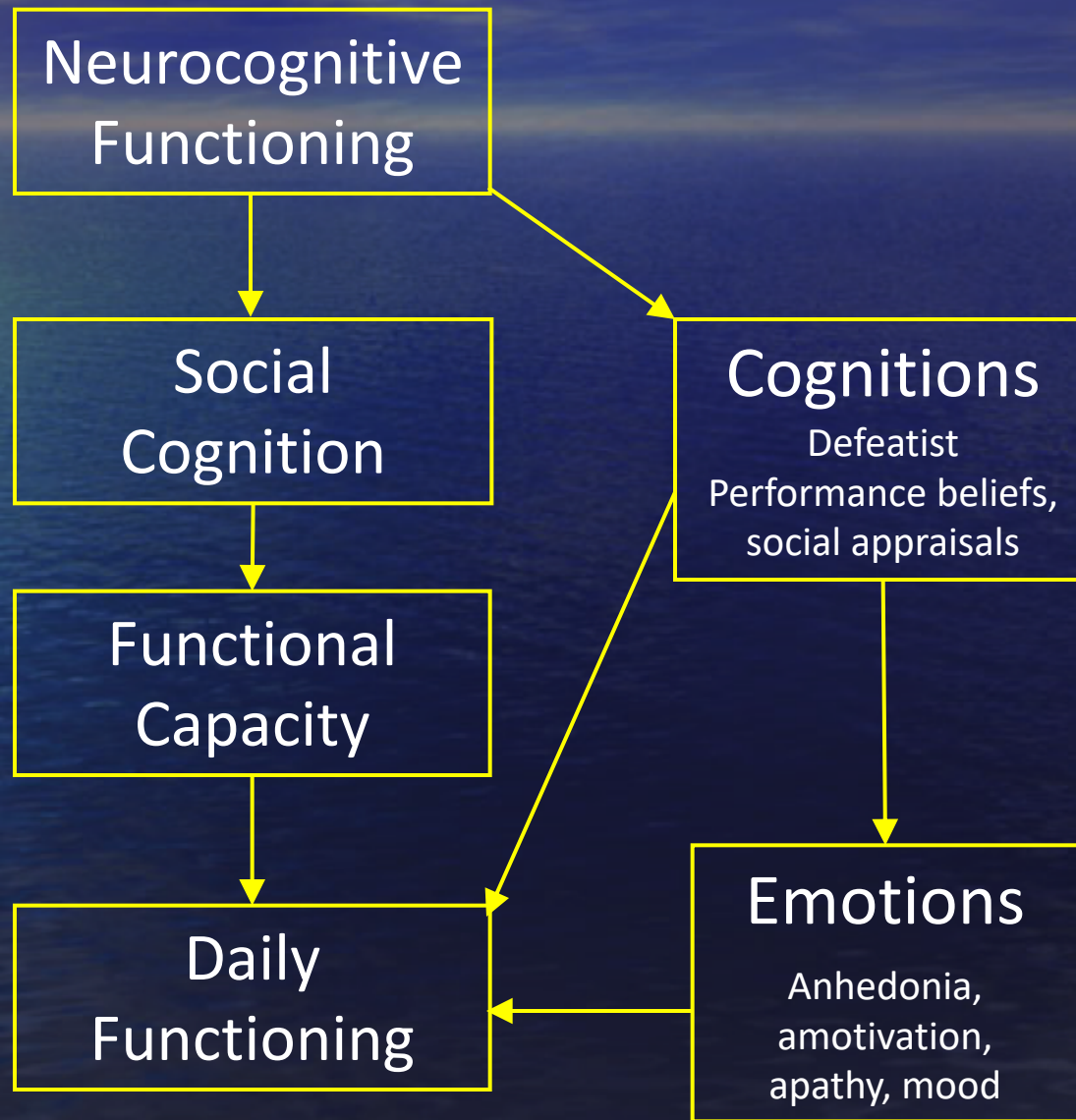
Model of Functional Outcome in Schizophrenia



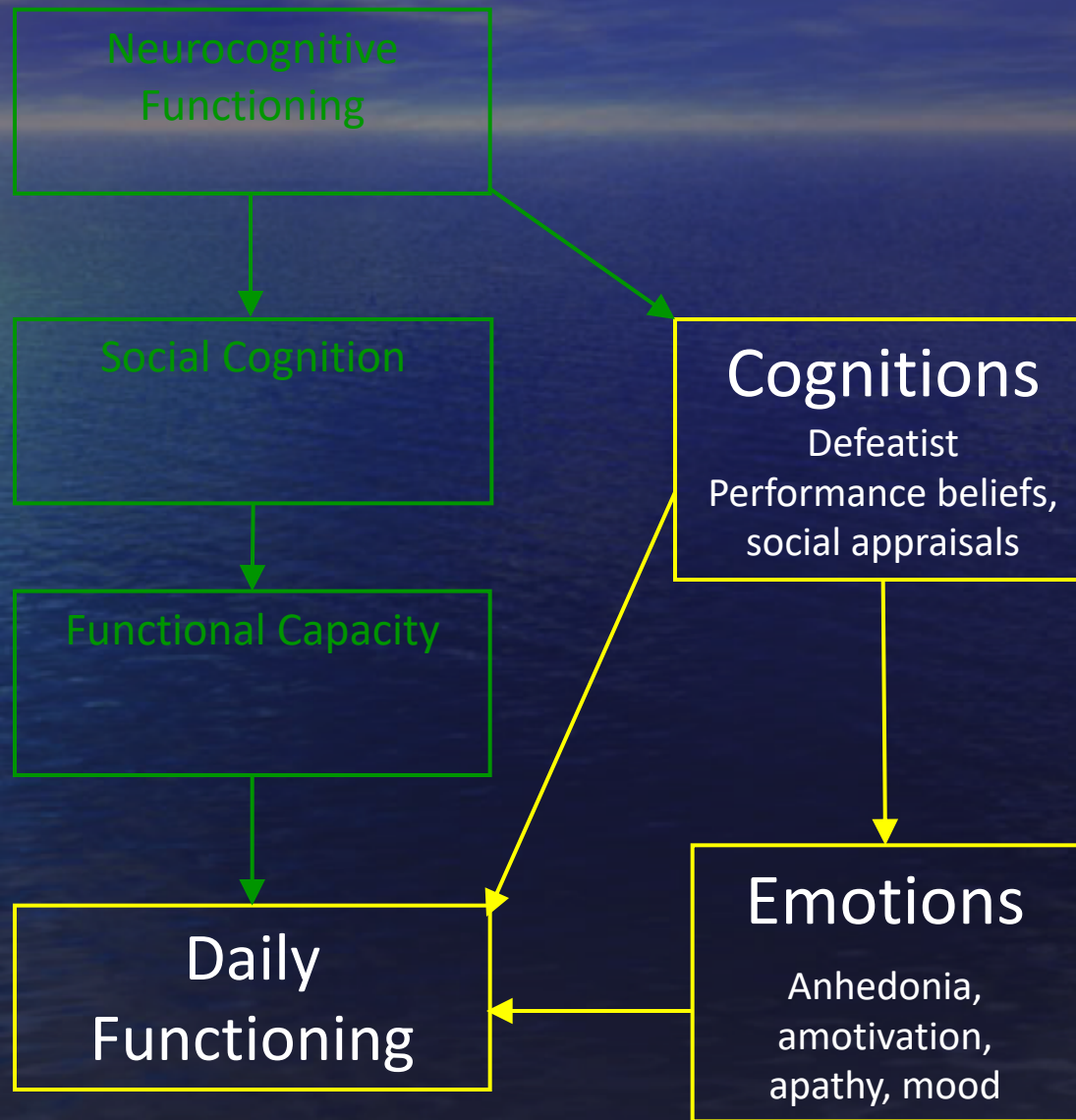
Model of Functional Outcome in Schizophrenia



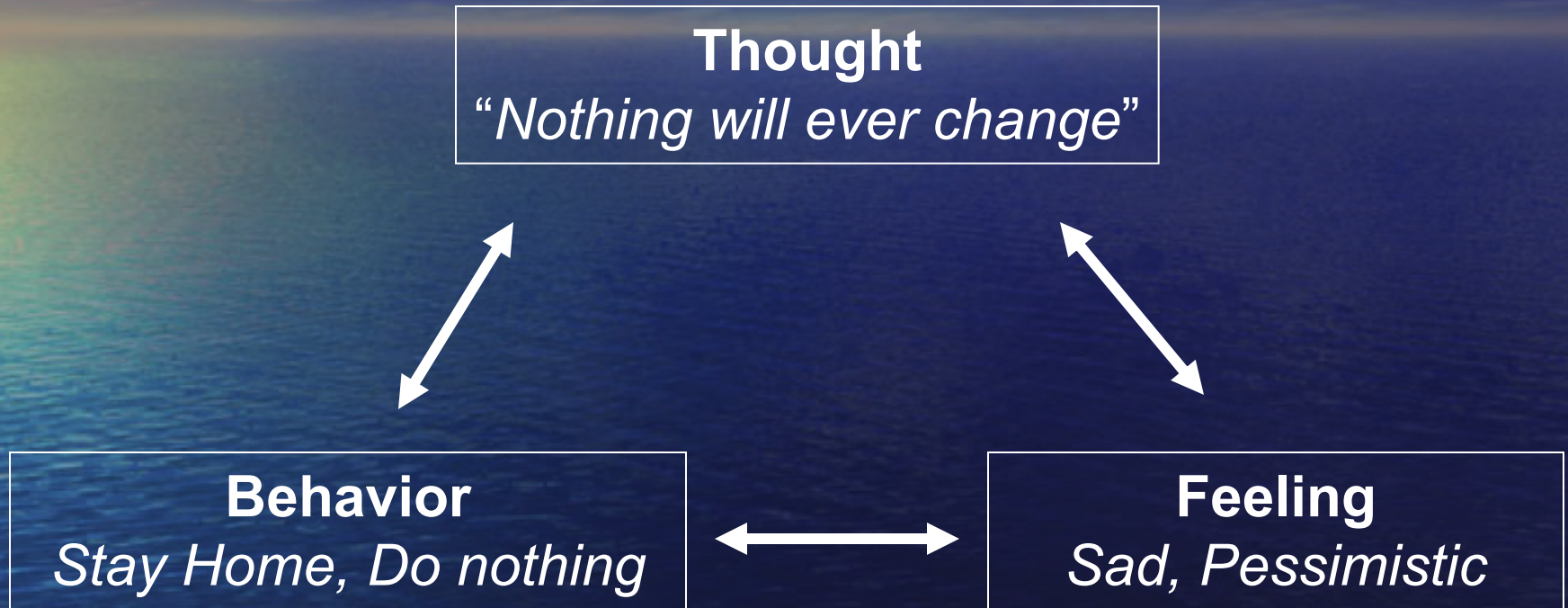
Model of Functional Outcome in Schizophrenia



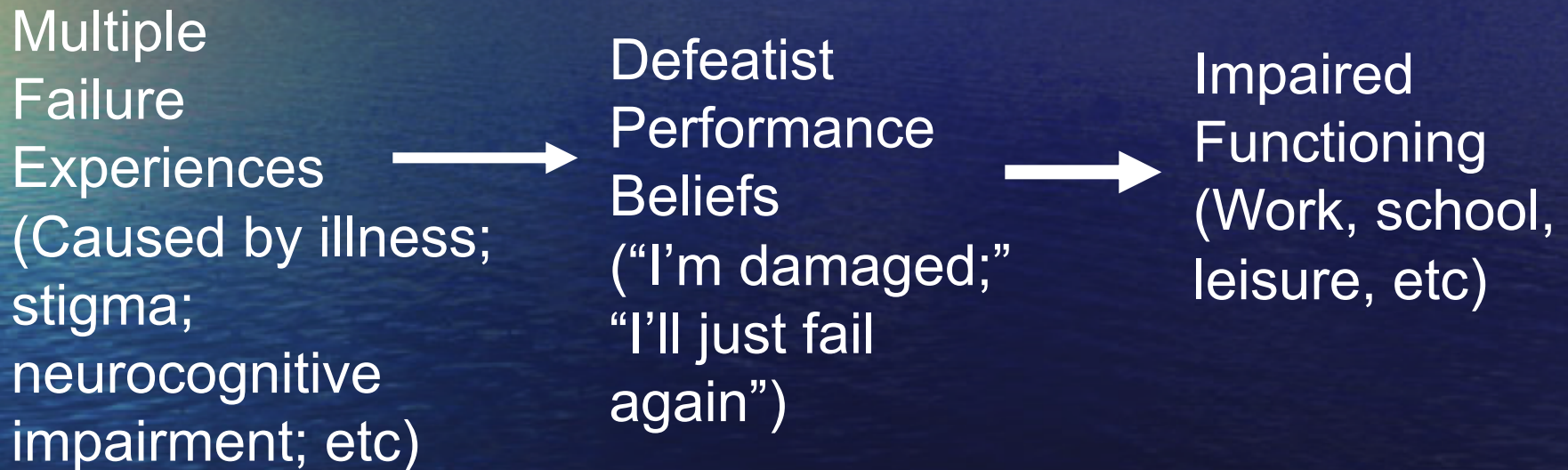
Model of Functional Outcome in Schizophrenia



Thoughts, Feelings, and Behaviors



Rationale for CBT for Functioning in Schizophrenia

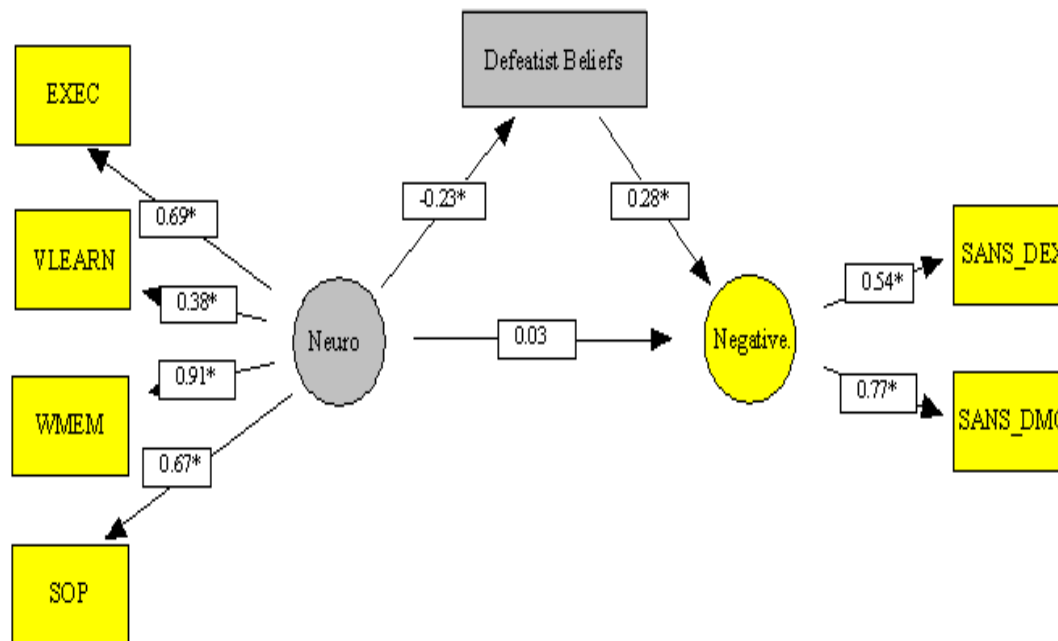


Challenge Defeatist Beliefs → Improve Functioning

Defeatist Performance Attitude Scale (DPAS)

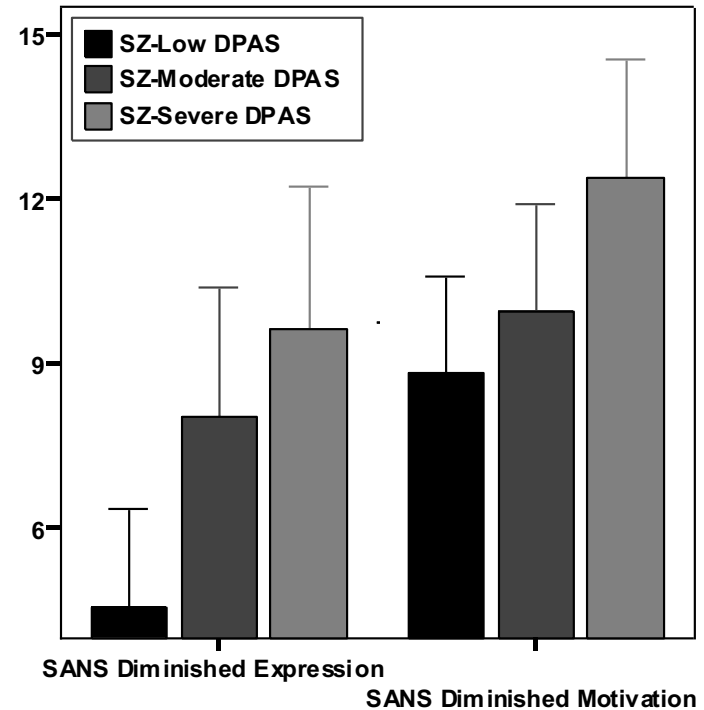
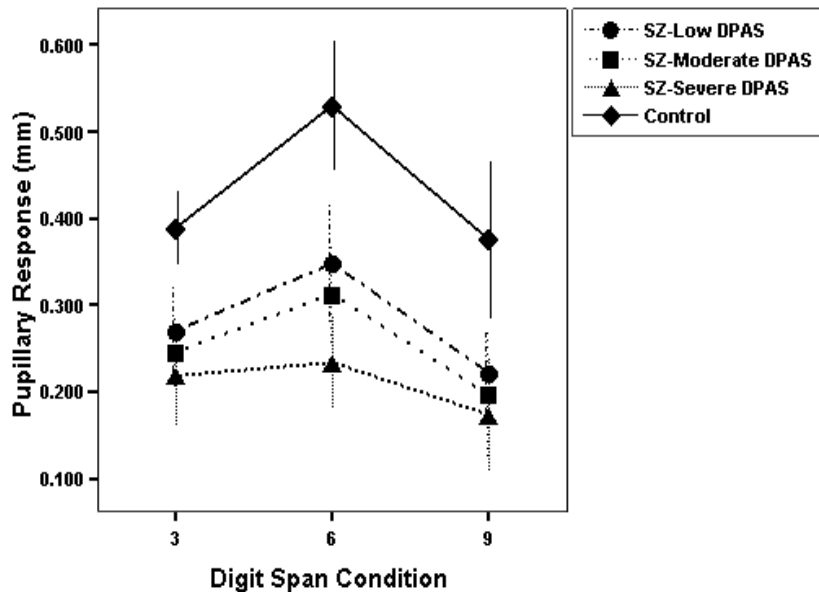
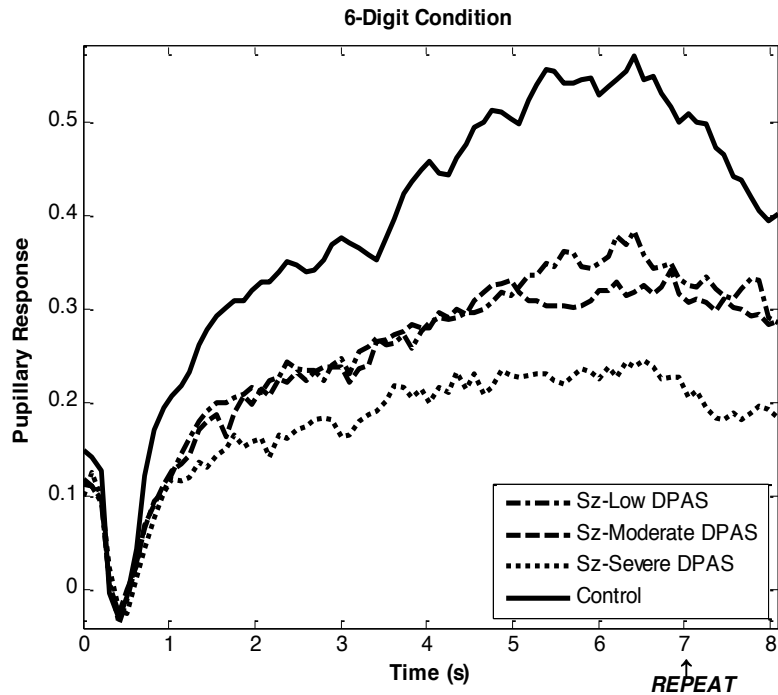
- ❖ If you cannot do something well, there is little point in doing it at all.
- ❖ If I fail partly, it is as bad as being a complete failure.
- ❖ If I fail at work, then I am a failure as a person.
- ❖ People will probably think less of me if I make a mistake.

DPAS Mediates the Neurocognition-Negative Symptoms Relationship



$\chi^2 [12, N = 204] = 18.54, p = .11; CFI = .977, RMSEA = .051$
Mediation model significantly better than direct

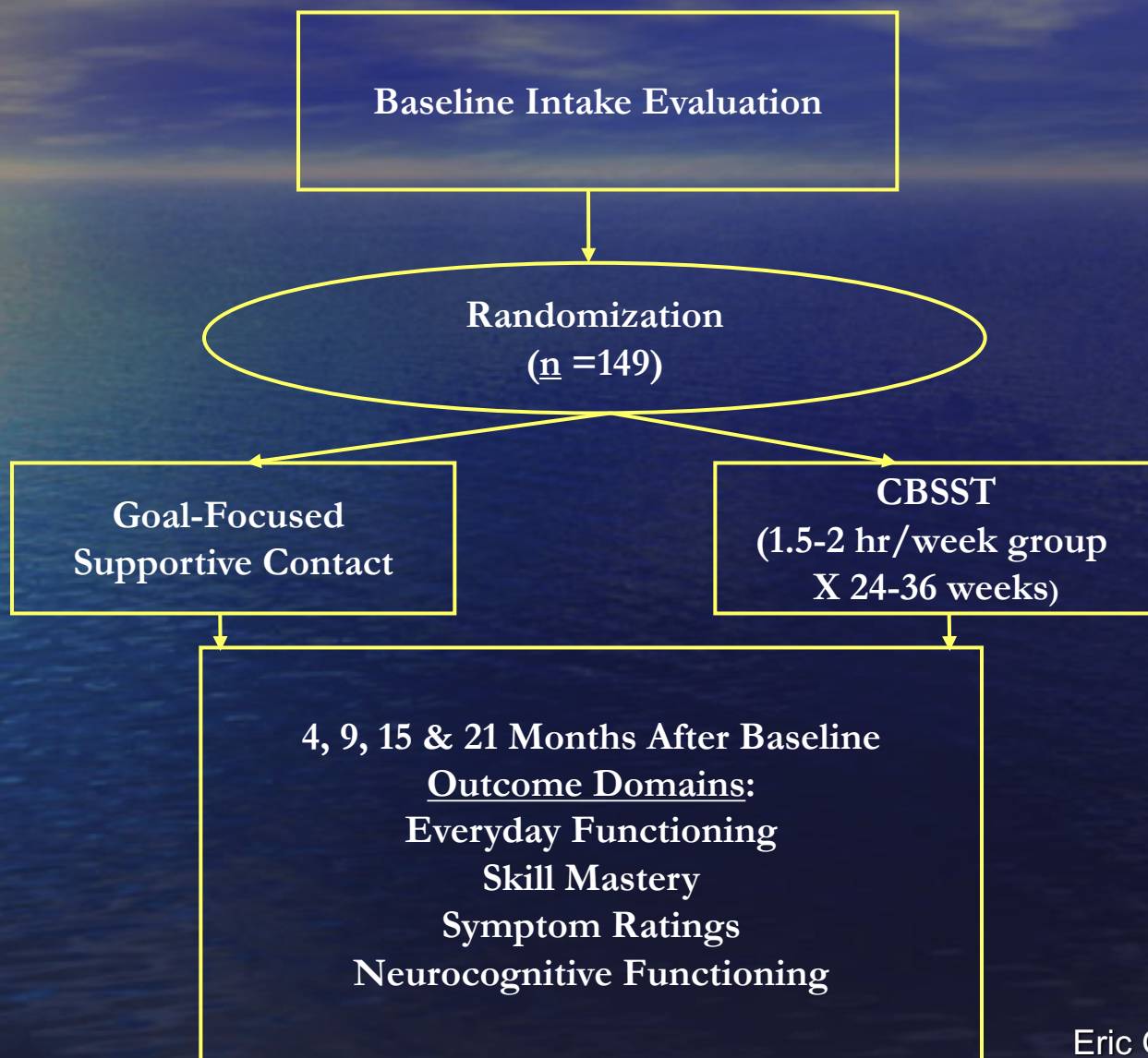
Defeatist Attitudes & Pupil Response During Digit Span



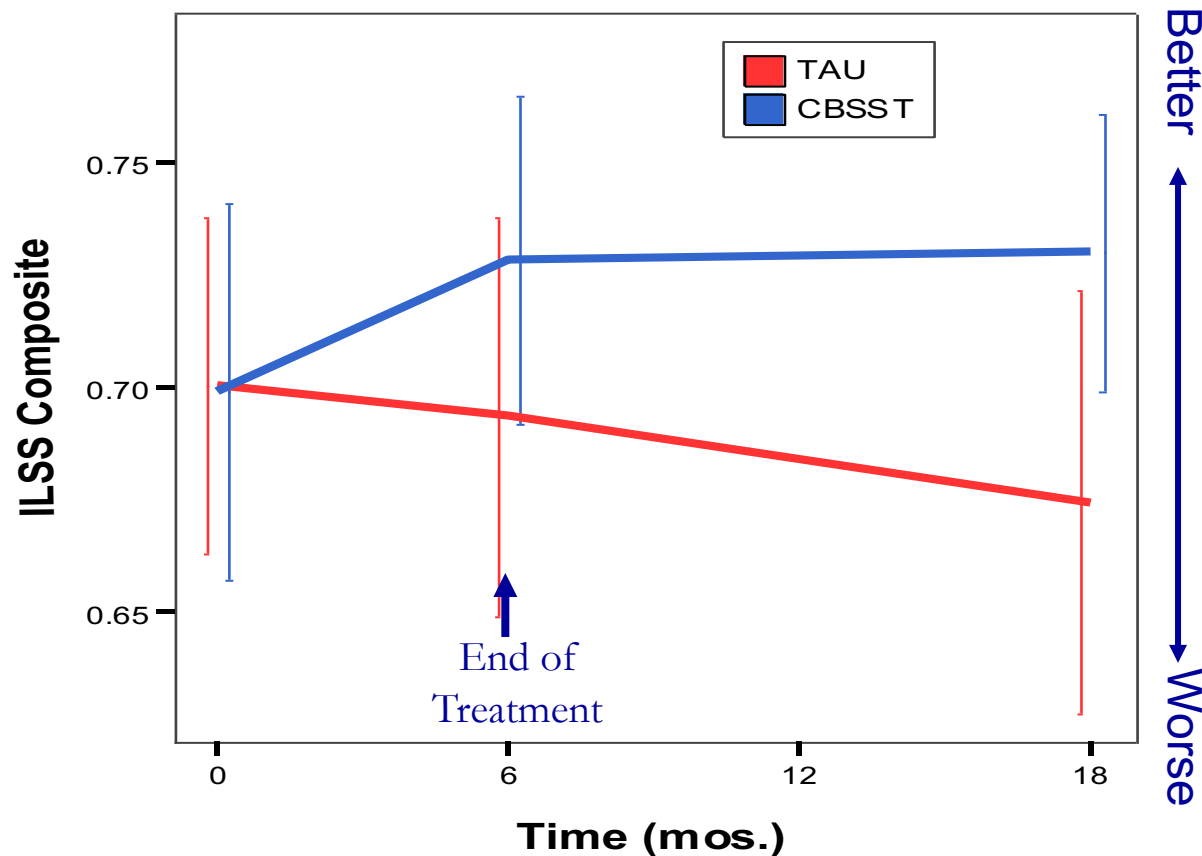
3 CBSST Modules: 6 Sessions Each (if repeated, 36 total sessions)

- Cognitive Skills Module
 - Cognitive Restructuring: 3C's; Behavioral Experiments
 - Mistakes in Thinking (All-or-None, Jumping Conclusions)
- Social Skills Module
 - Talking to Support Person & Dr. (role plays)
 - Basic Communication Skills
- Problem Solving Skills Module
 - Problem Solving Training (SCALE)
 - Social Functioning & Tx Adherence Targets

4 CBSST Randomized Clinical Trials



Improvement in Independent Living Skills (ILSS) CBSST v. TAU



HLM:

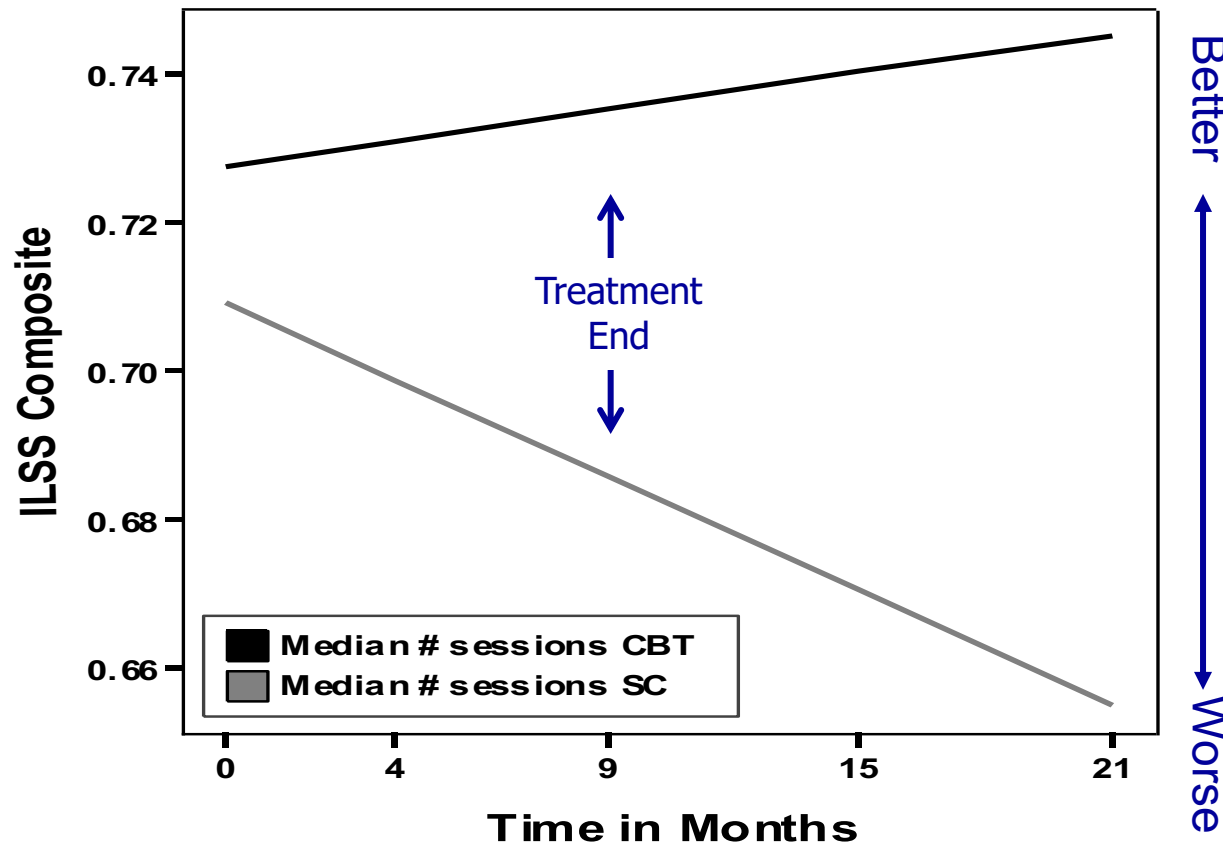
Group X Time:

$\gamma = .003$,

$t = 2.09$, $p < .05$

Eric Granholm, Ph.D.
CBSST.org

Improvement in Independent Living Skills (ILSS) in CBSST v. GFSC



HLM:

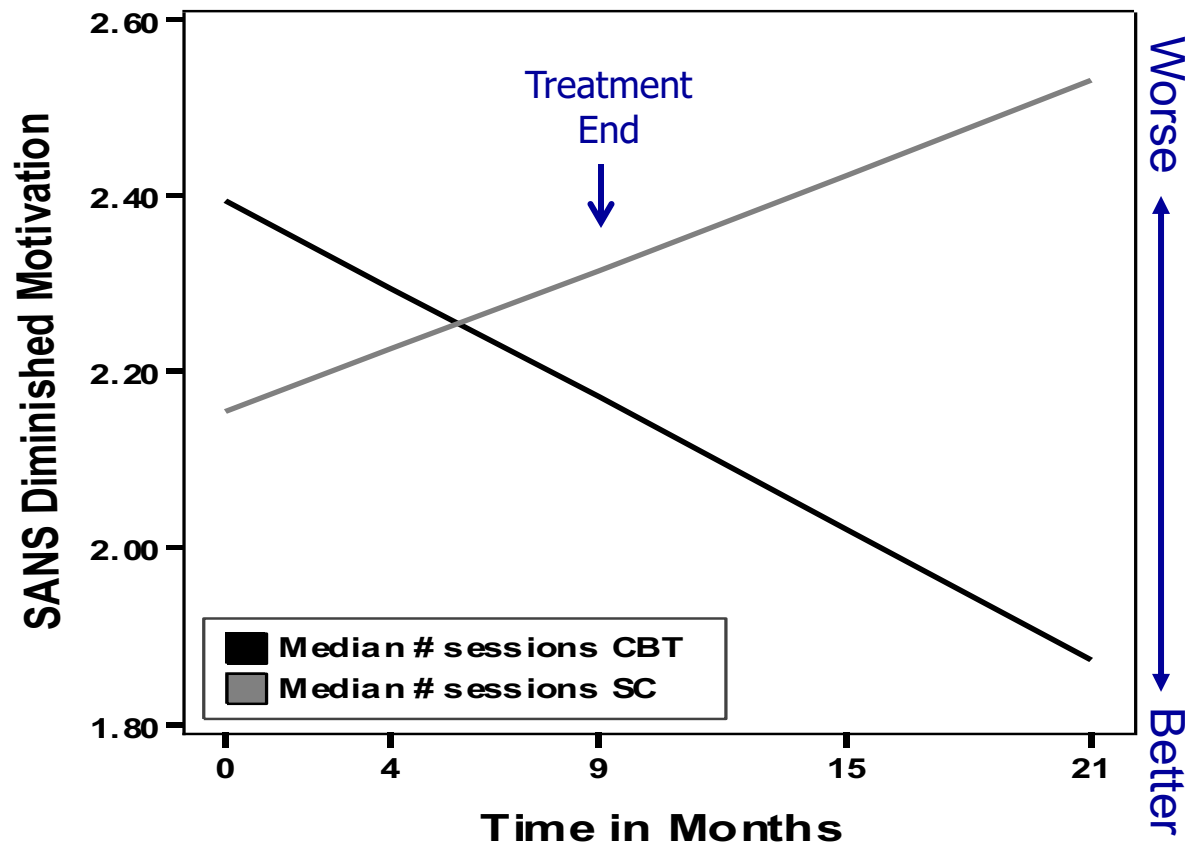
Group X Time:

$\gamma = .003$

$t = 3.20, p = .002$

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CBSST.org

Improvement in Amotivation/Asociality in CBSST v. GFSC



HLM:

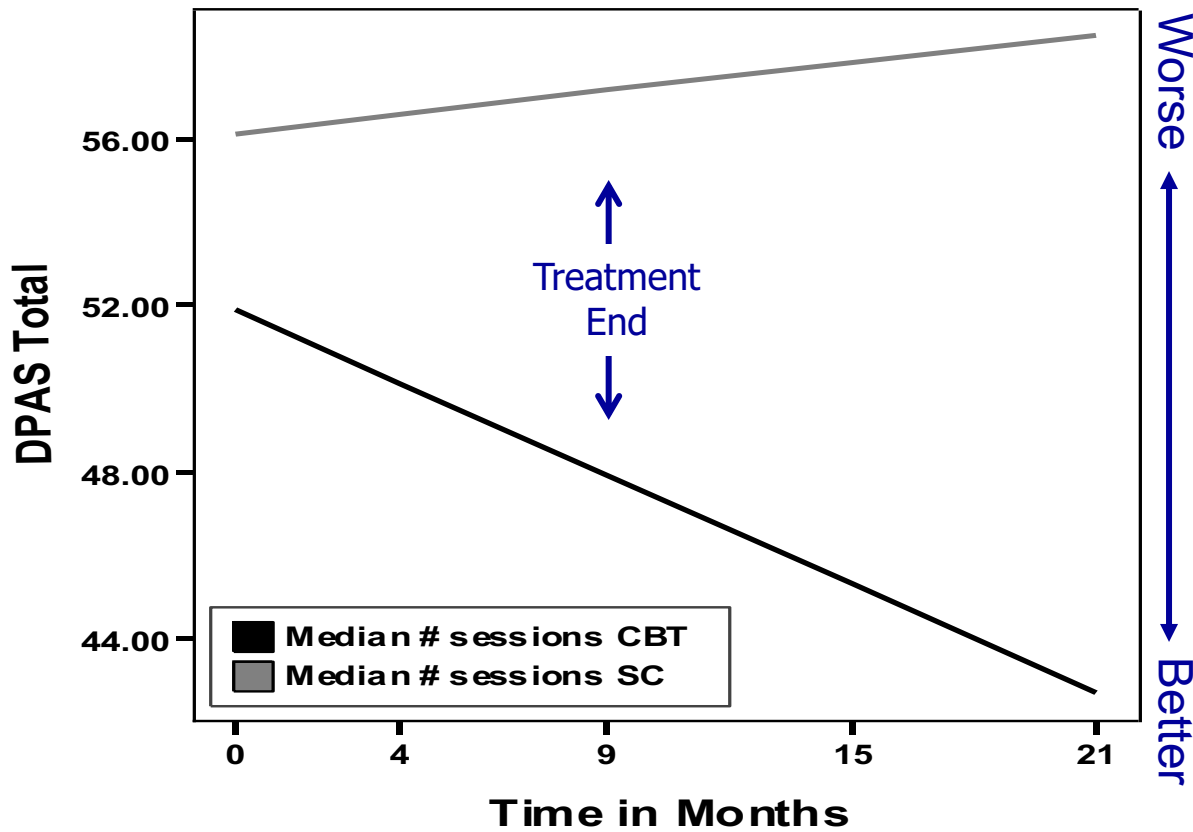
Group X Time:

$\gamma = -.04$,

$t = -2.35$, $p = .020$

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CBSST.org

Reduced Severity of Defeatist Attitudes in CBSST



HLM:

Group X Time:

$\gamma = -.55$,

$t = -2.69$, $p = .009$

Eric Granholm, Ph.D.
CBSST.org

4 CBSST Clinical Trials: Summary

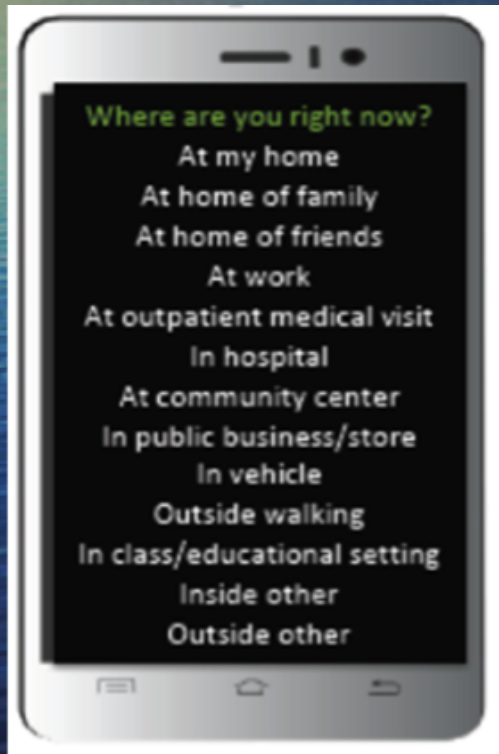
- ❖ CBSST v. TAU; CBSST v. GFSC; N=76-149
- ❖ Functioning improved more in CBSST than in control conditions in all trials
- ❖ Negative symptoms (amotivation/asociality) improved more in CBSST in 2 trials (younger samples)
- ❖ Reduction in defeatist attitudes mediated improvements

Joel Swendsen



Smartphone Technology

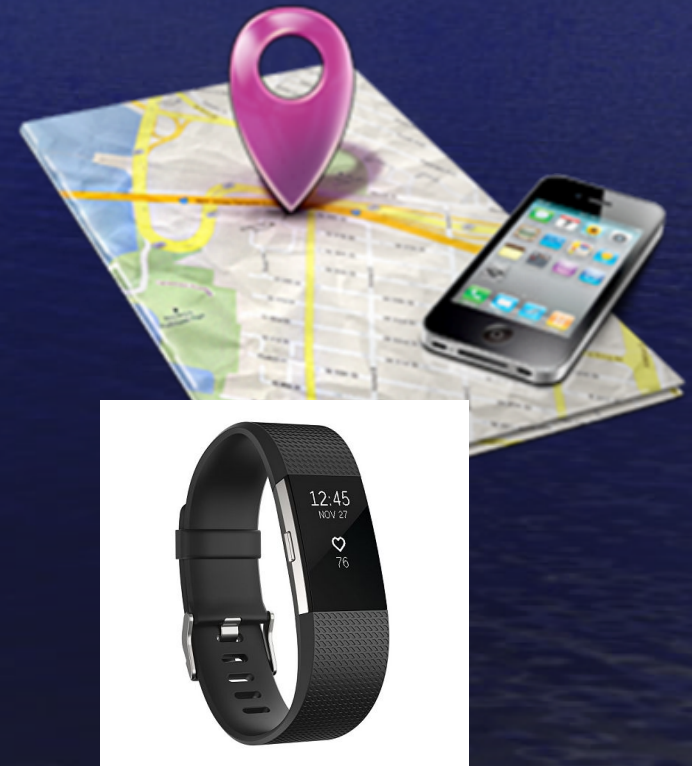
Ecological
Momentary Assessment



Mobile
Cognitive Assessment



Passive Sensors



**SEE!
...I TOLD YOU
THEY WERE
TRACKING US
WITH OUR CELL
PHONES!**

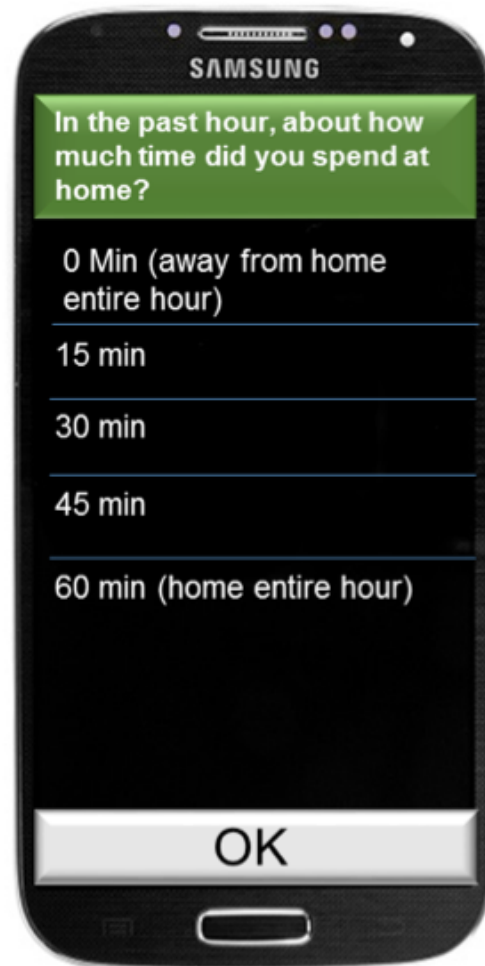


EMA: Ecological Momentary Assessment

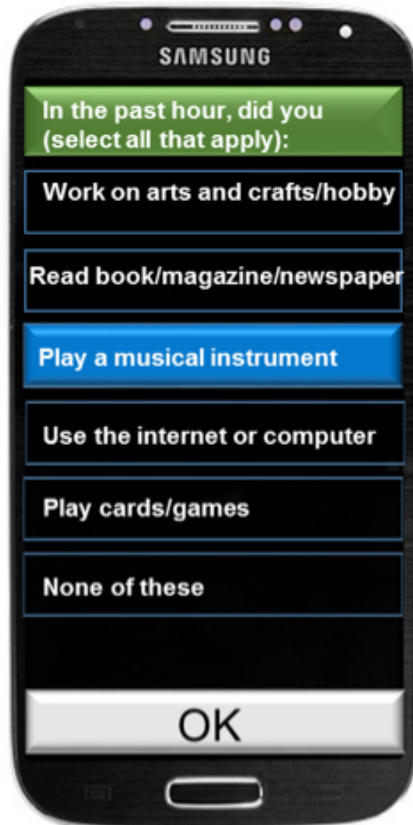
- a.k.a. ESM: Experience Sampling Method or Ambulatory Monitoring
- Smartphones collect responses to brief surveys at numerous moments in a day for about a week
- Ambulatory data collection allows real-time real-world assessment of functioning behaviors in the context of daily life, including social, leisure, work, education, self- and home-maintenance

Why EMA?

- Ecological validity
 - Measure in lab v. daily life
 - Index of what people are actually doing in real-world settings
- Study phenomena in real-time
 - Recall past weeks v. now or past hour
 - Captures the brief life cycle of causal mechanisms (e.g., moment-to-moment links between experiences, thoughts, feelings & behaviors)
- An intervention tool



At-home Leisure



A Samsung smartphone mockup displaying a survey screen titled "At-home Leisure". The screen has a black background with a green header bar containing the text "In the past hour, did you (select all that apply):". Below the header are seven black rectangular buttons with white text, each representing a different leisure activity. The third button, "Play a musical instrument", is highlighted with a blue background. At the bottom of the screen is a large, light gray "OK" button.

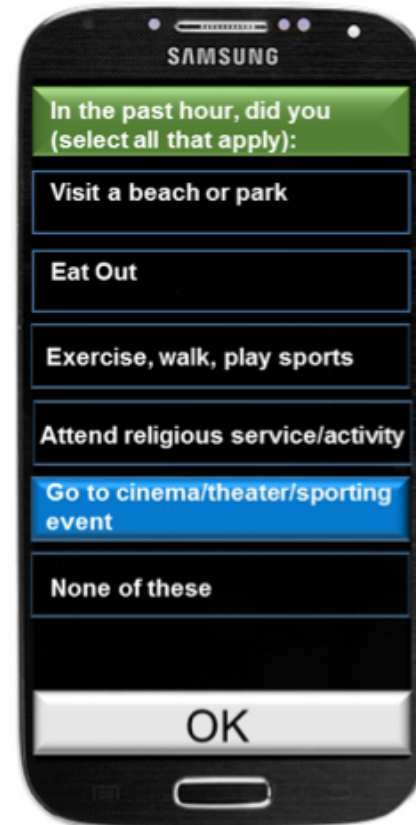
SAMSUNG

In the past hour, did you
(select all that apply):

- Work on arts and crafts/hobby
- Read book/magazine/newspaper
- Play a musical instrument
- Use the internet or computer
- Play cards/games
- None of these

OK

Outside-home Leisure



A Samsung smartphone mockup displaying a survey screen titled "Outside-home Leisure". The screen has a black background with a green header bar containing the text "In the past hour, did you (select all that apply):". Below the header are seven black rectangular buttons with white text, each representing a different leisure activity. The fifth button, "Go to cinema/theater/sporting event", is highlighted with a blue background. At the bottom of the screen is a large, light gray "OK" button.

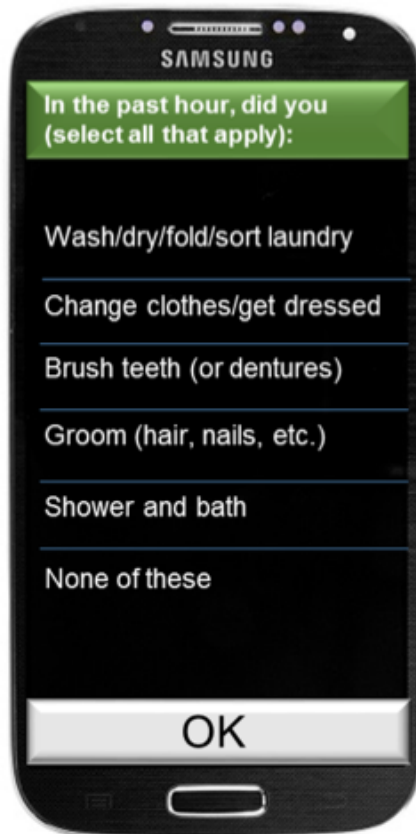
SAMSUNG

In the past hour, did you
(select all that apply):

- Visit a beach or park
- Eat Out
- Exercise, walk, play sports
- Attend religious service/activity
- Go to cinema/theater/sporting event
- None of these

OK

Self-Care



A Samsung smartphone screen displaying a survey titled "Self-Care". The screen has a black background with white text. At the top, the Samsung logo is visible. Below it, a green header bar contains the text "In the past hour, did you (select all that apply):". The main content area lists six options, each on a separate line with a horizontal line to its right: "Wash/dry/fold/sort laundry", "Change clothes/get dressed", "Brush teeth (or dentures)", "Groom (hair, nails, etc.)", "Shower and bath", and "None of these". At the bottom of the screen is a large, light gray button with the text "OK".

SAMSUNG

In the past hour, did you
(select all that apply):

Wash/dry/fold/sort laundry

Change clothes/get dressed

Brush teeth (or dentures)

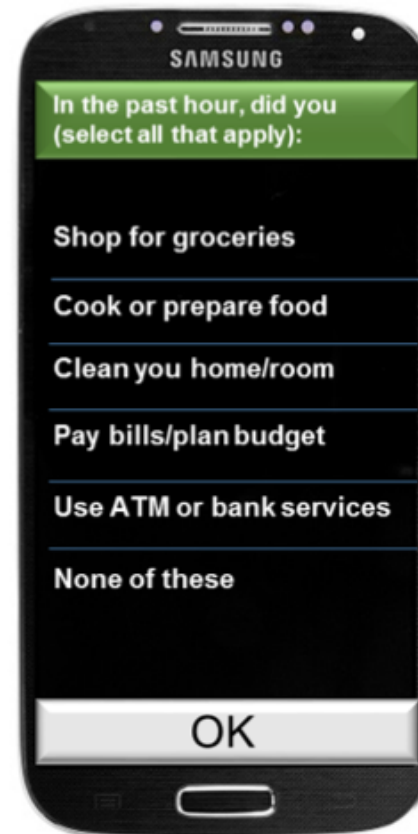
Groom (hair, nails, etc.)

Shower and bath

None of these

OK

Home-Care



A Samsung smartphone screen displaying a survey titled "Home-Care". The screen has a black background with white text. At the top, the Samsung logo is visible. Below it, a green header bar contains the text "In the past hour, did you (select all that apply):". The main content area lists six options, each on a separate line with a horizontal line to its right: "Shop for groceries", "Cook or prepare food", "Clean you home/room", "Pay bills/plan budget", "Use ATM or bank services", and "None of these". At the bottom of the screen is a large, light gray button with the text "OK".

SAMSUNG

In the past hour, did you
(select all that apply):

Shop for groceries

Cook or prepare food

Clean you home/room

Pay bills/plan budget

Use ATM or bank services

None of these

OK

Vocational

SAMSUNG

In the past hour, did you
(select all that apply):

- Look for work (classifieds,
interview, etc.)
- Work at job program or
volunteer job
- Work paid job (not program)**
- Attend a class
- Do school homework**
- None of these

OK

Non-productive

SAMSUNG

In the past hour, did you
(select all that apply):

- Lay down and rest**
- Watch TV**
- Listen to music/radio
- Sit alone
- Hang out or pace
- None of these

OK

Please answer the following questions about your recent interactions where you talked with others in person or on the telephone
DURING THE PAST HOUR.



A Samsung smartphone screen displaying a survey question. The question is in a green header bar: "In the past hour, how many interactions did you have?". Below the header, there are seven radio button options: "0 (none)", "1", "2", "3", "4", "5", and "6 or more". At the bottom of the screen is a large "OK" button.

SAMSUNG

In the past hour, how many interactions did you have?

0 (none)

1

2

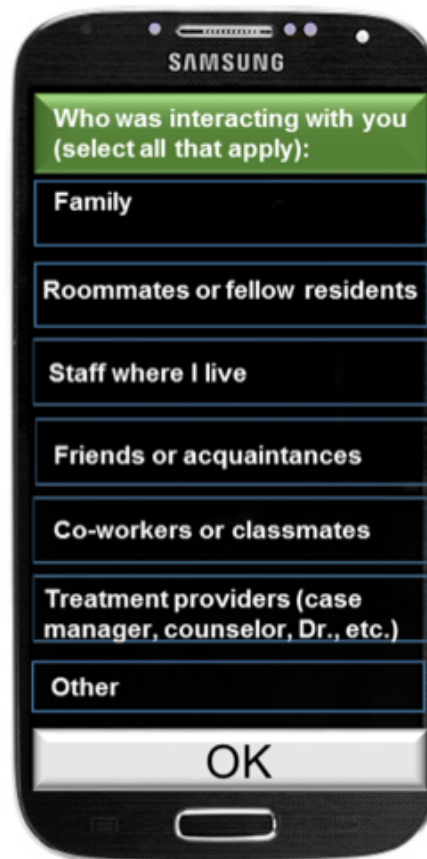
3

4

5

6 or more

OK



A Samsung smartphone screen displaying a survey question. The question is in a green header bar: "Who was interacting with you (select all that apply):". Below the header, there are seven checkboxes with labels: "Family", "Roommates or fellow residents", "Staff where I live", "Friends or acquaintances", "Co-workers or classmates", "Treatment providers (case manager, counselor, Dr., etc.)", and "Other". At the bottom of the screen is a large "OK" button.

SAMSUNG

Who was interacting with you (select all that apply):

Family

Roommates or fellow residents

Staff where I live

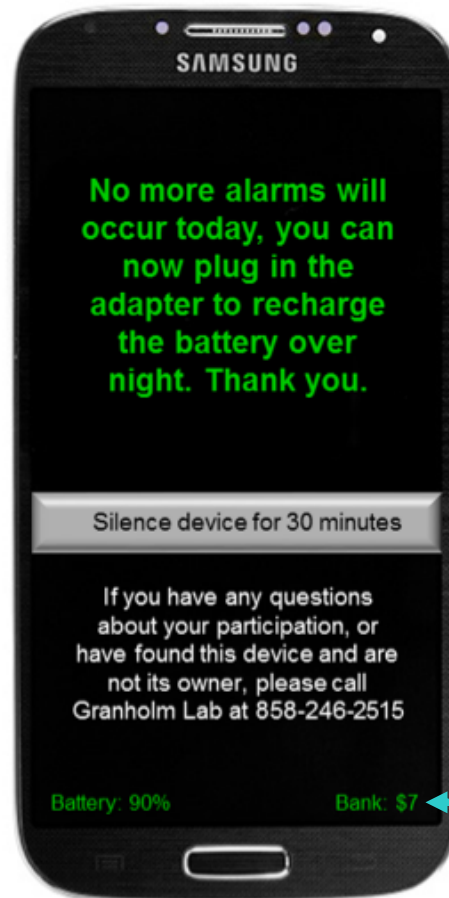
Friends or acquaintances

Co-workers or classmates

Treatment providers (case manager, counselor, Dr., etc.)

Other

OK

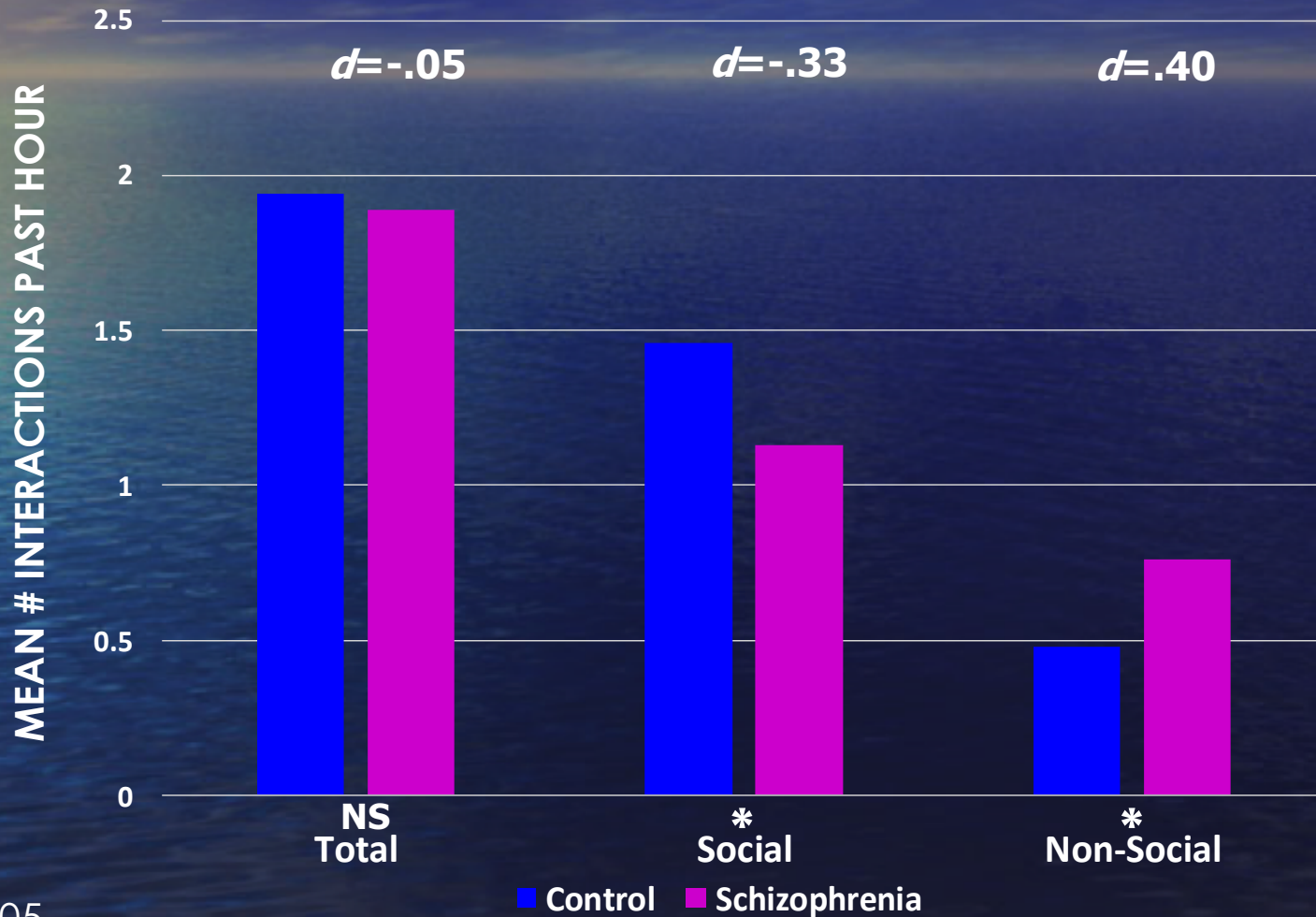


← \$1 per survey

Adherence/Feasibility

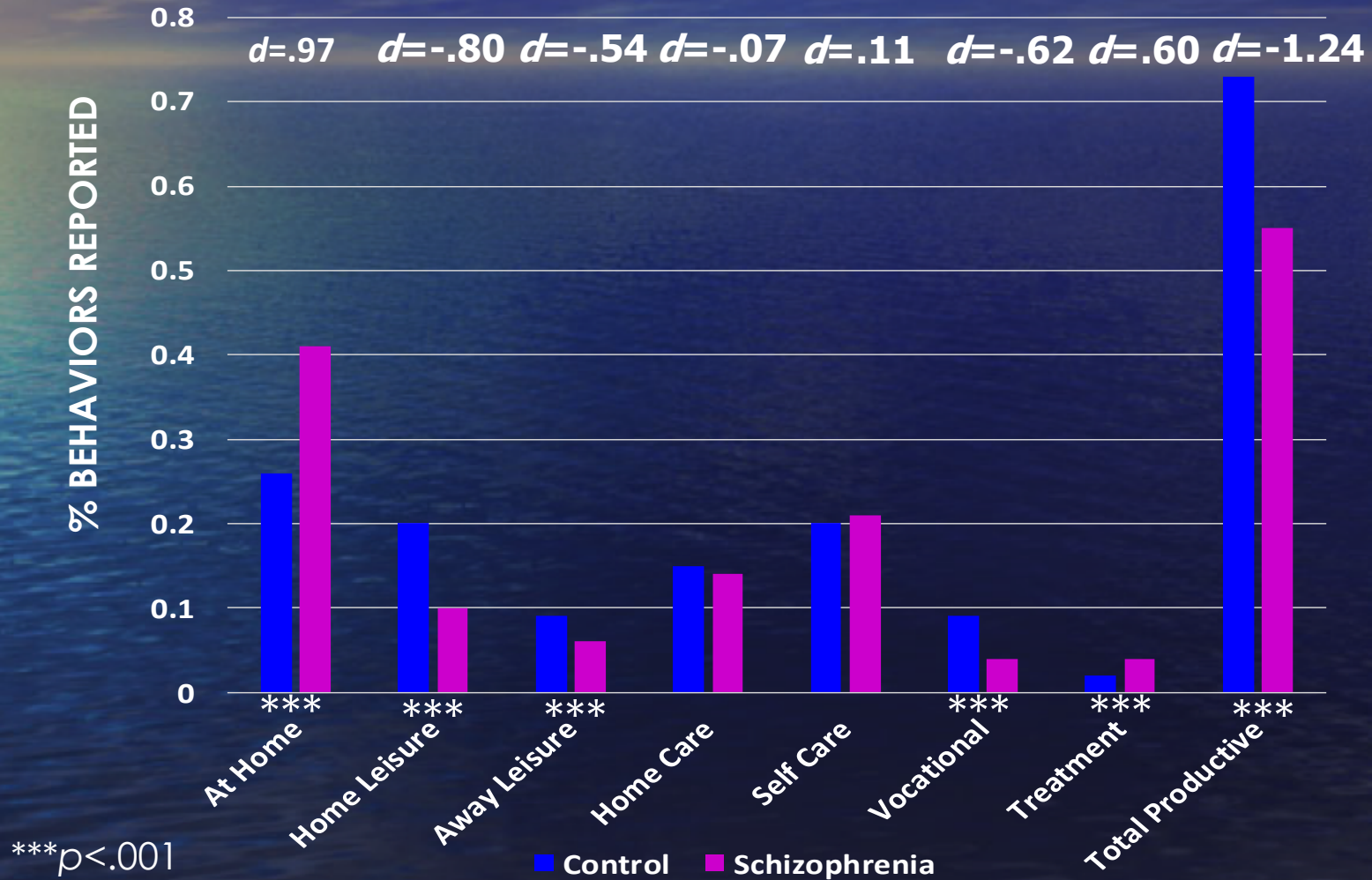
- Excluded for <33% (17) surveys completed:
 - SZ=2.9% (3/103); HC=6.6% (5/76); $X^2=1.38$, $p=.209$
- M (SD) surveys completed (42/49=86%):
 - SZ=41.6 (7.4); HC=41.9 (7.8); $t(169)=0.20$, $p=.842$
- Only lost 4 phones (1 SZ; 3 HC) of 179 participants (2.2%)
- 2 phones (1 SZ; 1 HC) malfunctioned resulting in EMA data loss

Social and Non-Social Interactions: Schizophrenia (N=100) v. Control (N=71)

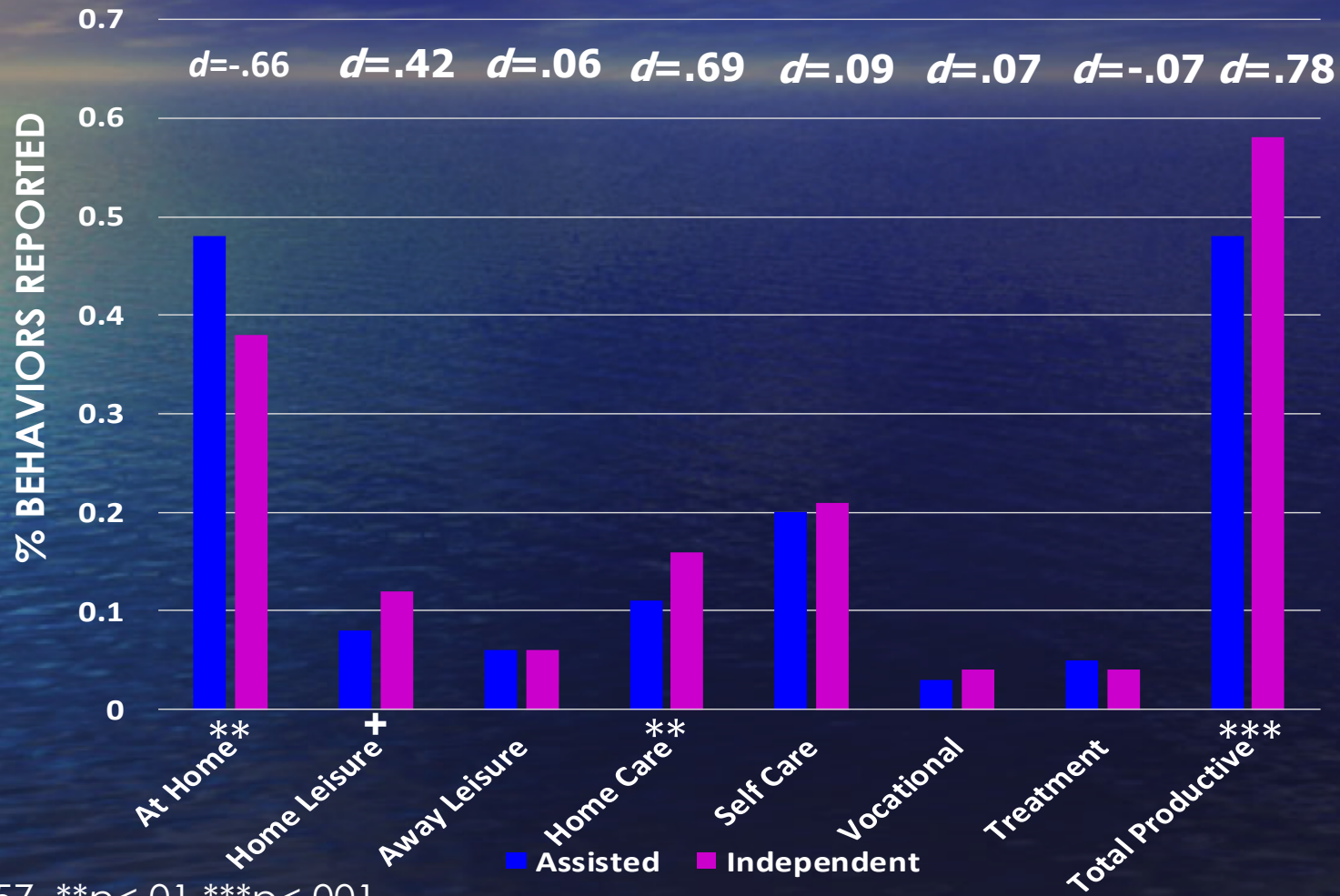


* $p < .05$

Functioning Behaviors Reported: Schizophrenia (N=100) v. Control (N=71)

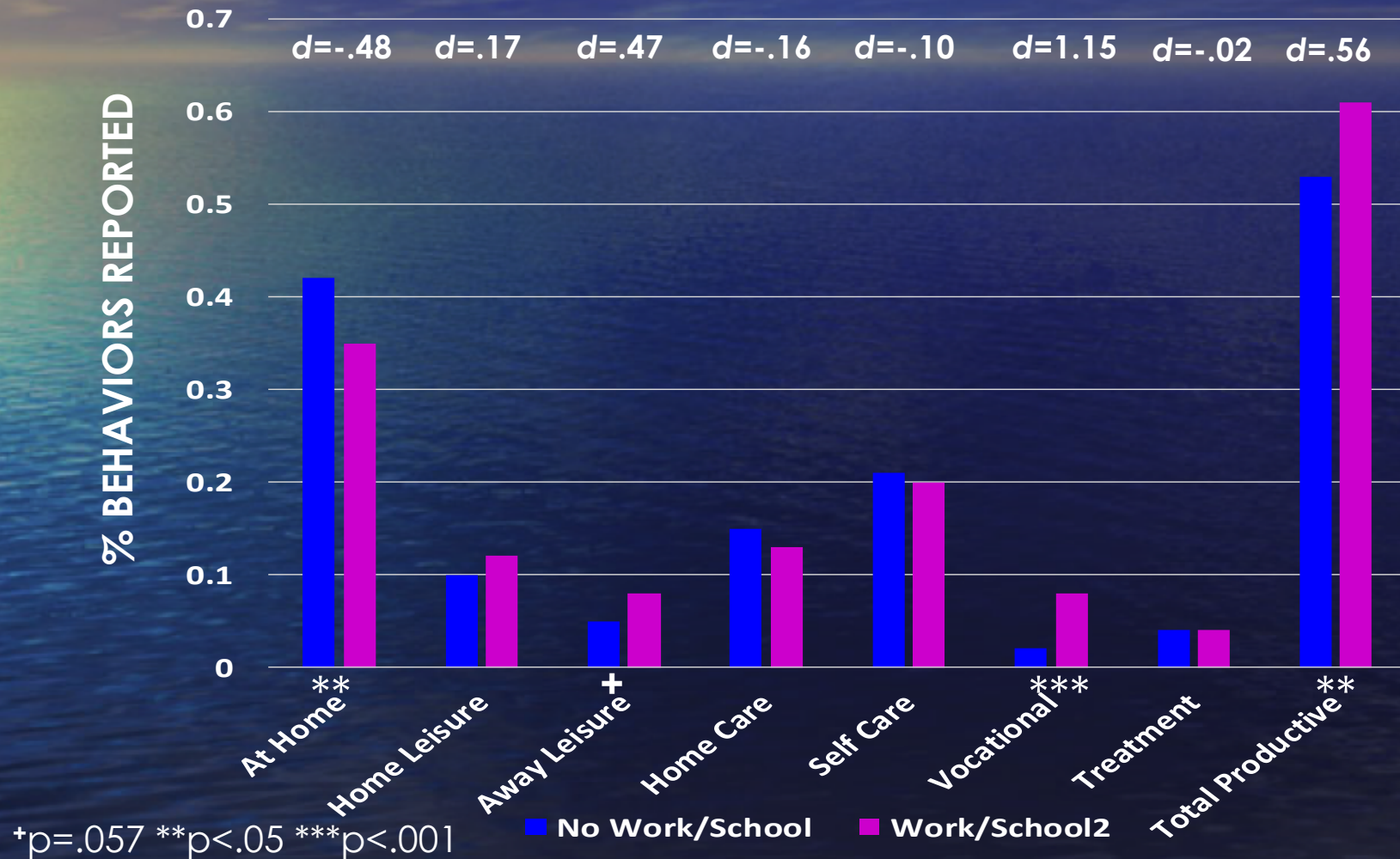


Functioning Behaviors Reported: Independent (n=70) v. Assisted Living (n=30)



+p=.057 **p<.01 ***p<.001

Functioning Behaviors Reported: Work/School (n=23) v. None (n=78)



Functioning Behaviors Reported: 1-mo. Test-Retest Reliability

EMA Variable	Schizophrenia (N=78)	Control (N=47)	Total Sample (N=125)
At Home	.76	.77	.81
Self-Care	.65	.73	.67
Home-Care	.75	.71	.73
Home Leisure	.77	.69	.76
Away Leisure	.65	.66	.67
Vocational	.74	.83	.82
Treatment	.66	.43	.66
Total Productive	.73	.80	.82

Correlations Between EMA and In-Lab Functioning Measures by Good and Poor Neurocognitive Abilities

EMA Variable	ILSS	SLOF
<u>NP Global T-Score >40</u>		
Total Productive	.47***	.05
<u>NP Global T-Score <40</u>		
Total Productive	.17	.09

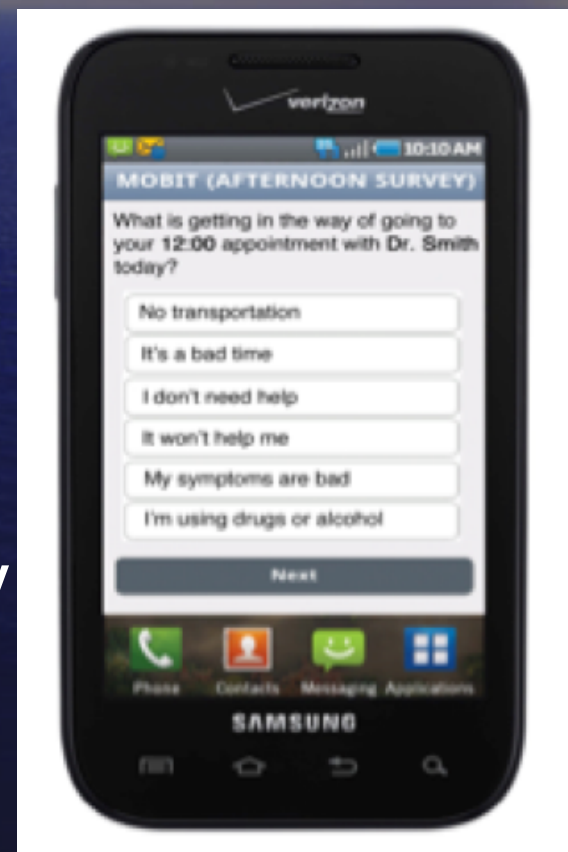
*** $p < .001$

EMA Summary

- EMA is feasible and reliable:
 - Excellent adherence, minimal device loss/malfunction, very good reliability
- Evidence for validity:
 - Excellent face/ecological validity
 - Highly sensitive to deficits relative to healthy controls with large effect sizes
 - Highly sensitive to objective indicators of functioning (independent living, work, school)

Optimization of Mental Health Interventions through Technology

- **Deliver care outside of the clinic setting**
(reduce need for transportation)
- **Reduce or extend face-to-face interventions**
(increase access by diminishing staff time)
- **Increase recall of health-beneficial actions**
(compensate for forgetting, waning motivation)
- **Collect data to:**
 - **Better measure program outcomes and fidelity**
(enable quality improvement)
 - **Predict problems and deliver care in a timely fashion** (allocate care to high risk periods)



MATS: Sample Text Exchanges

Did you take your meds today?

1=Yes

2=Don't want to*

3=Only some

4=Forgot

Do your meds help you stay healthy?

1= Not at all*

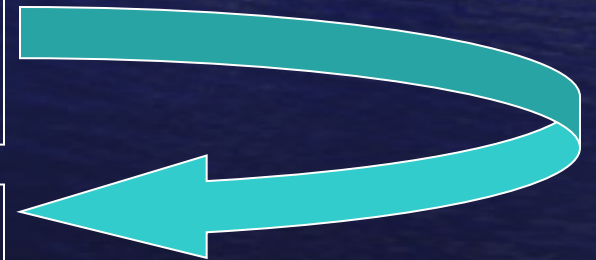
2= Unsure

3= Somewhat

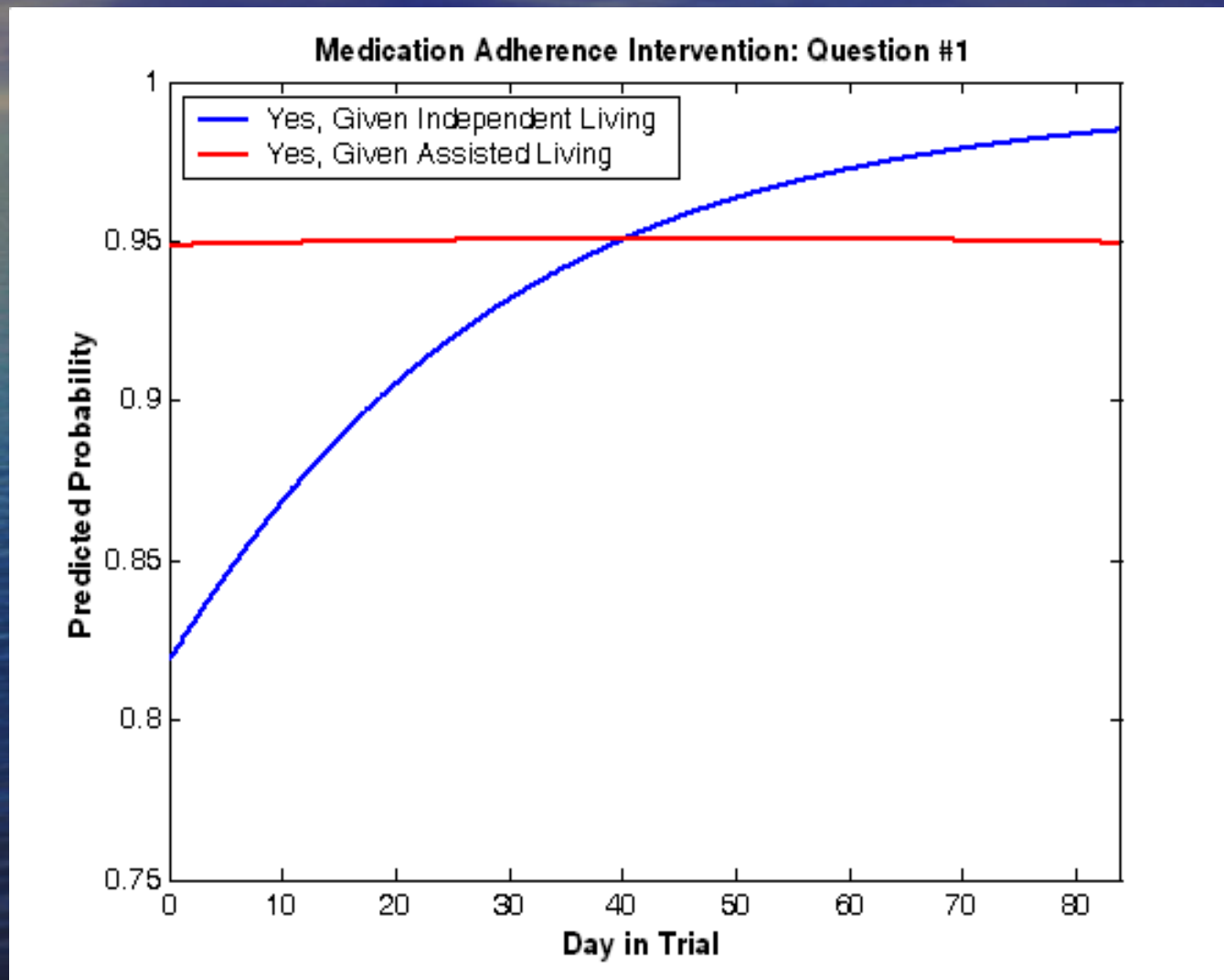
4 =Yes definitely

Remember, you said taking meds helps you do better in class.

Reconsider. Maybe ask someone you trust what they think.



Medication Adherence



Thank You

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Thank You!

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