

9/19/23

Center for HIV Identification, Prevention, and Treatment Services (CHIPTS)  
HIV Grand Rounds

# USING INTENSIVE LONGITUDINAL MEASUREMENT TO UNDERSTAND SEXUAL HEALTH AND SUBSTANCE USE IN VULNERABLE POPULATIONS

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# OVERVIEW

1. Why situations matter and how to study them
  - *Intensive longitudinal measurement*
2. Diary studies exploring psychological well-being, substance use, and sex
  - *Project LogOn & Brothers Connect Study*
  - *Adolescent Trials Network Study (ATN 112)*
3. Summary & next steps

## GLOSSARY

- Sexual behavior-related

- CAI: *Condomless anal intercourse*
- GBM: *Gender-based misconduct*
- MSM: *Men who have sex with men*
- STI: *Sexually transmitted infection*
- UAI/UVI: *Unprotected anal intercourse/unprotected vaginal intercourse*

- Measures-related

- CES-D: *Center for Epidemiological Studies scale*
- FAHI: *Functional Assessment of HIV Infection scale*
- K10: *Kessler Psychological Distress Scale*
- POMS: *Profile of Mood States scale*

*Intensive longitudinal measurement, ecological momentary assessment (EMA), diary studies...I often use these terms interchangeably*

# MY WORK

## CONTEXT

Minority stress  
Religious institutions  
Traumatic life experiences  
Syndemic conditions

## PROCESS

Mood  
Self-efficacy/empowerment  
Emotion regulation  
Resilience  
Coping

## OUTCOME

Psychological well-being  
HIV/STI risk  
Substance use  
Engagement in care/adherence

# TODAY'S TALK

**CONTEXT**



**PROCESS**



**OUTCOME**

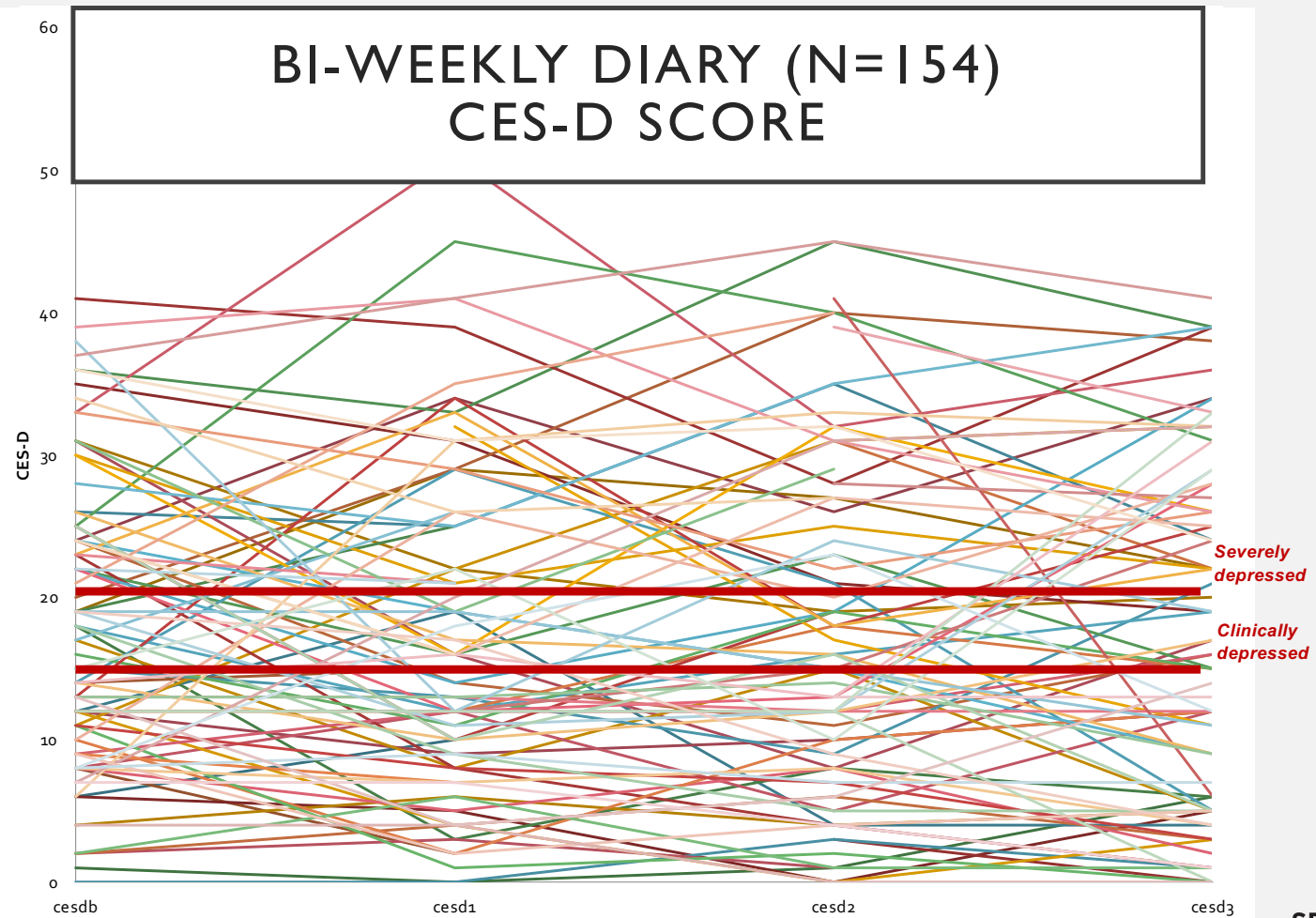
Mood  
Emotion  
regulation

HIV/STI risk  
Substance use  
Sexual health  
communication

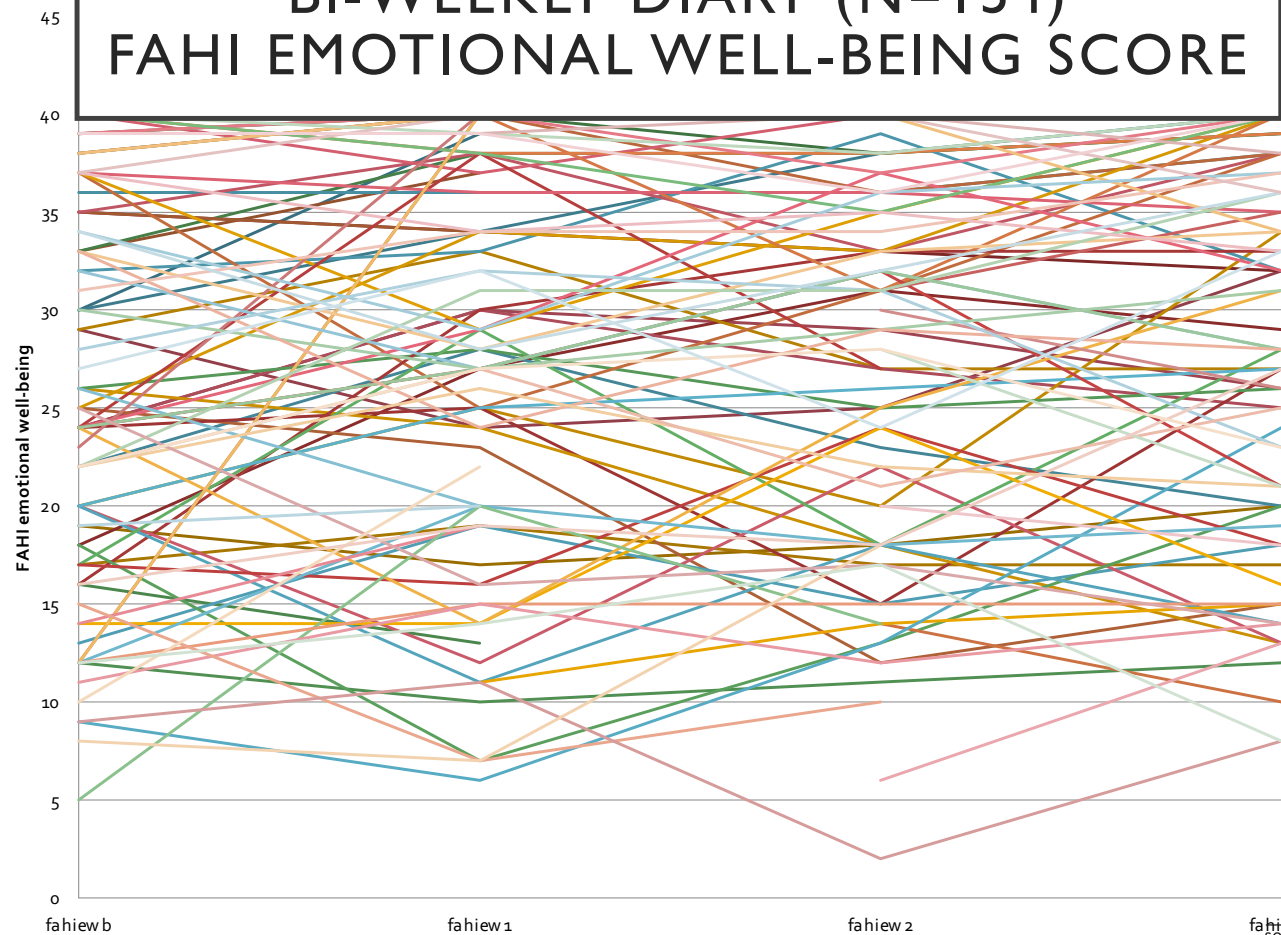
## MAIN TAKEAWAYS FROM THIS TALK

- Sexual and gender minorities experience fluctuations in mood and substance use, and these fluctuations predict risk independent of person-level factors.
  - Likely causal relationships between psychological distress and sexual risk, and drug use and sexual risk, in non-clinical (i.e., with regard to depression and substance use disorder) populations
- Communication is essential to healthy sex.
  - Understanding communication within a situational context that incorporates partner characteristics and behaviors
- The promotion of psychological well-being is a critical, but often overlooked, component mental and sexual health interventions.
  - Developing personal/tailored plans to deal with stressors/risks, intentions for happiness
  - Promoting emotion regulation to maintain health behaviors

## BI-WEEKLY DIARY (N=154) CES-D SCORE

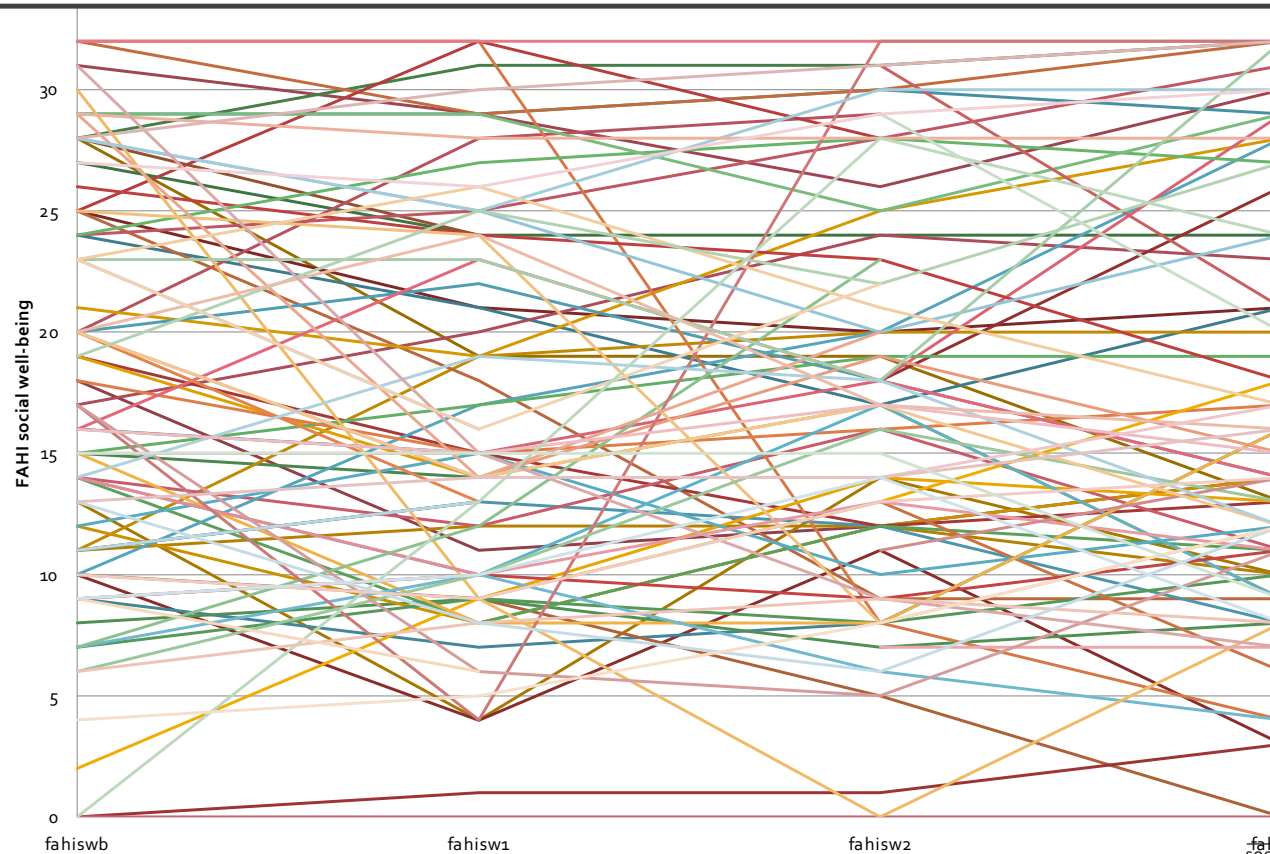


# BI-WEEKLY DIARY (N=154) FAHI EMOTIONAL WELL-BEING SCORE





## BI-WEEKLY DIARY (N=154) FAHI SOCIAL WELL-BEING SCORE



# WHY SITUATIONS MATTER AND HOW TO STUDY THEM

## WHY SITUATIONS MATTER

- Traditional models of sexual risk focusing on person-level factors may be insufficient at explaining enhanced risk
  - Distal and proximal (i.e., *situational*) context factors frequently overlooked
- Features of situational contexts important to consider
  - **Behavior settings** (Barker, 1949; 1978)
  - **Psychology of the situation** (Magnusson, 1981)
  - **Risk situation** (Ross & Pinto, 2000; Ross et al., 2004)
    - Important to describe the situation in which risk behavior occurs, and factors that may initiate or promote risk situations
    - Risk situations : *temporally, geographically & socially* bounded

# WHY SITUATIONS MATTER

Journal of Personality and Social Psychology  
2010, Vol. 98, No. 2, 319–341

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0022-3514/10/\$12.00 DOI: 10.1037/a0017785

## Toward a Person $\times$ Situation Model of Sexual Risk-Taking Behaviors: Illuminating the Conditional Effects of Traits Across Sexual Situations and Relationship Contexts

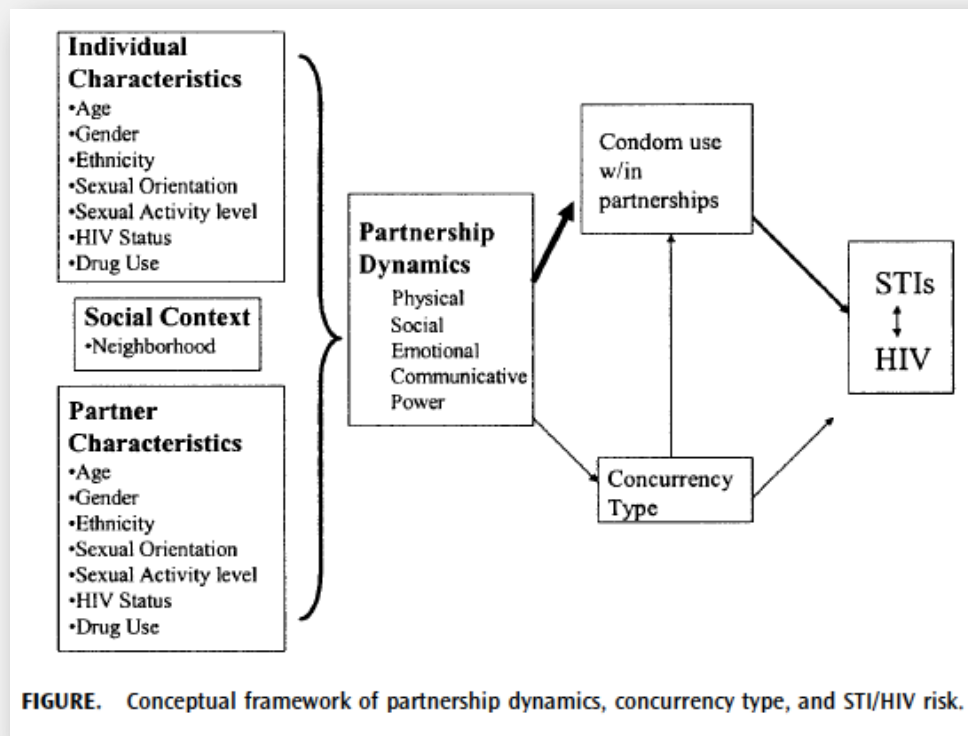
### Person $\times$ Situation Effects on Sexual Risk-Taking Behaviors

In the present study, more than half (13 of 25) of all trait  $\rightarrow$  risky behavior associations examined were moderated by situation type or relationship commitment level. Conversely, every situation type and relationship commitment effect was moderated by one or more traits. Thus, most traits do not predispose to increased risk taking in a global or typical way, just as specific sexual situations and relationship commitment contexts do not invariably lead to greater risk taking. Rather, in most cases, it is the unique combination of the person and the situation that confers maximal risk.

## WHY SITUATIONS MATTER

- The situation as a **crucial element** in health; one of the most powerful predictors of behavior (Ross, 2000, p. 251)
- Research methods that account for **hot** and **cold** cognition
  - Hot cognition: *emotional*; inside during the sexual situation
  - Cold cognition: *rational*; outside the sexual situation
- Quantitative methodologies for exploring sexual situations
  - **Vignettes** (Ross et al., 2004)
  - **Episode-level analyses** (Wilson, Diaz, Yoshikawa & Shrout, 2009)
  - **Diary analyses/Ecological Momentary Assessment** (Boone, Cook & Wilson, 2012; Cherenack, Wilson, Kreuzman, & Price, 2016; Wilson et al., 2008, 2013)

## WHY SITUATIONS MATTER



Gorback & Holmes (2003). Transmission of STIs/HIV at the partnership level: Beyond individual-level analyses.  
*Journal of Urban Health.*

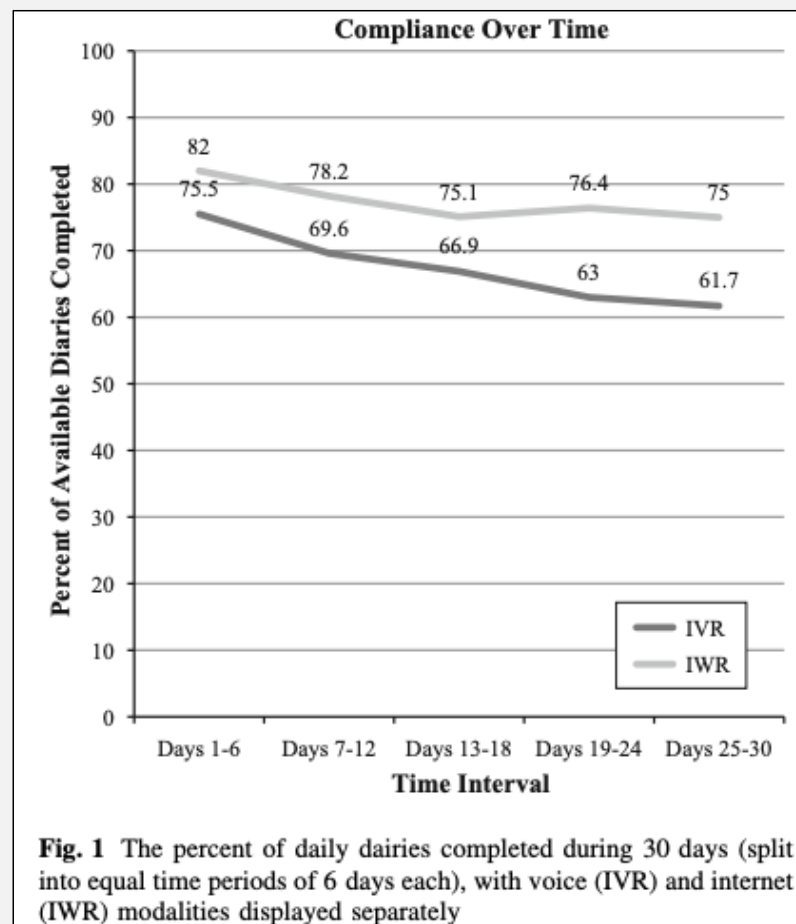
## ASSESSING SITUATIONS

- Structured diaries
  - Repeated over time (e.g., hourly, daily, weekly, randomly) for a set period of days/weeks
  - Closed-choice questions; similar to a questionnaire. Sex diaries ask participants questions about most recent sexual encounter.
- Provide **prospective** as opposed to **retrospective** data
  - Prospective data more reliable & valid; reduces recall bias
  - May allow for greater causal inference
- Two levels of data:
  1. Person-level
  2. Episode-level (sexual episodes nested within persons)
- Primary unit of analysis is the **sexual encounter**

## ASSESSING SITUATIONS

### Approaches to enhancing compliance/increasing response rates

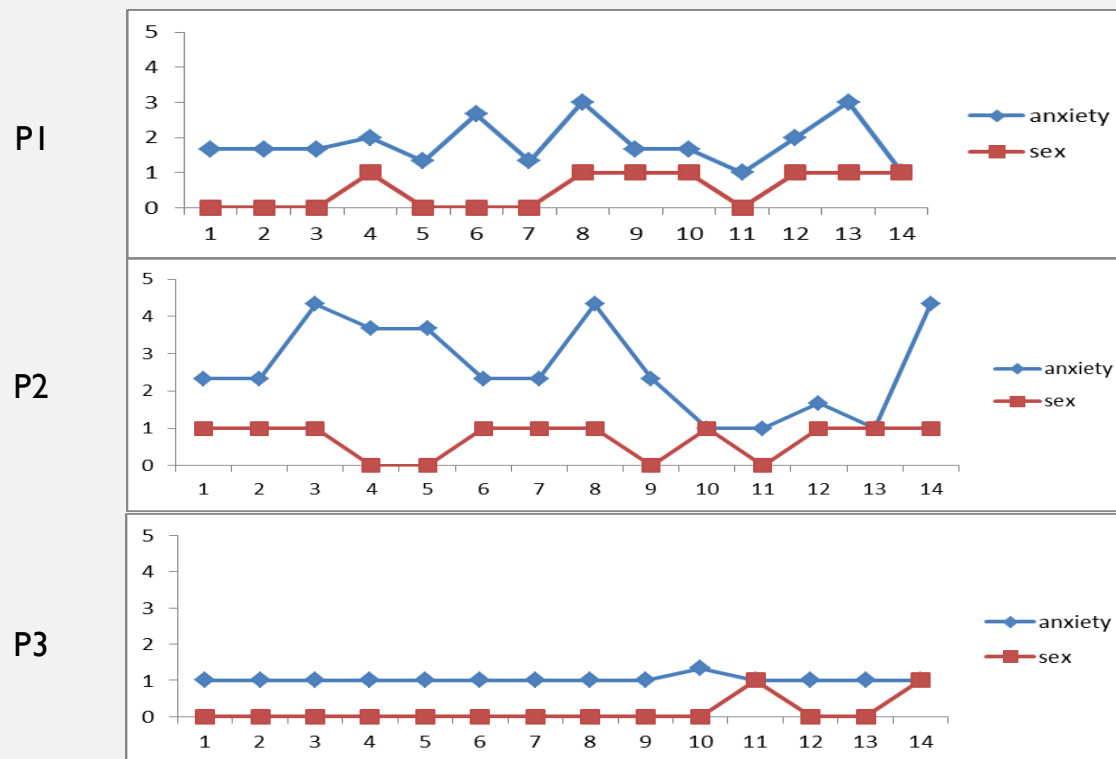
- Automated and personal reminders
- Use of tiered incentives (e.g., \$2/day 1<sup>st</sup> week, \$3/day 2<sup>nd</sup> week, etc.)
- Loss aversion tactics (i.e., penalties for non-compliance)
- Lotteries
- Use of “dummy measures” to avoid skipping items
- *Make it fun!*



Cherenack, Wilson, Kreuzman, & Price (2016). Feasibility and acceptability of using technology-based daily dairies with HIV-positive young men who have sex with men: a comparison of web and phone modalities. *AIDS & Behavior*.



# 14-DAY DAILY DIARY PILOT (N=15) POMS ANXIETY SCORE & SEX



# DIARY STUDIES EXPLORING PSYCHOLOGICAL WELL-BEING, SUBSTANCE USE AND SEXUAL RISK

Project LogOn & The Brothers Connect Study (BCS)

# STUDY DESIGN

## PROJECT LOGON

- Longitudinal study; participants log on to a website to complete sex & drug diary 6 times over a 2-month period
- Data collected between 2007-2009
- 158 participants recruited via outreach (48%), participant referrals (39%), and media ads (13%)
- Eligibility: over 18, self-reported sexual behavior with another man in past 2 months; HIV-positive serostatus
- Weekly assessments on depression, well-being, and sexual behavior in prior week for 2 months

## BROTHERS CONNECT STUDY

- Longitudinal study; participants log on to a website to complete weekly sex & drug diary over a 2-month period
- Data collected between 2010-2012
- 154 participants recruited via outreach (43%), participant referrals (36%), and online ads (21%)
- Eligibility: 18-30; Black/African-American; self-reported sexual behavior with >1 partner in past 2 months
- Weekly assessments on depression, well-being, and sexual behavior in prior week for 2 months

# PROJECT LOGON SAMPLE CHARACTERISTICS (N=158)

Variable	Percentage/Mean
<b>Age</b>	Mean: 39 years (range: 20-61)
<b>Employment status</b>	
Working	15%
Disability	40%
Unemployed	30%
Student/Other	6%
<b>College degree</b>	26%
<b>Sexual identity</b>	
Gay	82%
Bisexual	15%
Other	3%
<b>Relationship status</b>	
Having sex with 1 partner	20%
Having sex with >1 partner	80%
<b>HIV/AIDS status</b>	
Undetectable viral load	45%
AIDS diagnosis (CD4 $\leq$ 200)	15%
<b>Mental health status</b>	
Moderately depressed (CES-D > 16)	47%
Severely depressed (CES-D > 25)	25%
<b>Drug use</b>	
Any drug use in past 2 mo.	80%
Coke, crack, meth use in past 2 mo.	45%
<b>Condomless anal intercourse in past 2 mo.</b>	60%

## BROTHERS CONNECT STUDY SAMPLE CHARACTERISTICS (N=154)

Variable	Percentage/Mean	Variable	Percentage/Mean
<b>RACE/ETHNICITY</b>		<b>SEXUAL ORIENTATION</b>	
African-American/Black	56%	Gay	73%
Black Hispanic/Latino	23%	Bisexual	27%
Afro-Caribbean/West Indian	10%	<b>HAVING SEX W/ 2 OR MORE PARTNERS</b>	80%
Mixed-race	11%	<b>SERODISCORDANT CAI</b>	28%
<b>EDUCATION</b>		<b>HIGH HIV RISK CAI (SERODISCORDANT CAI, NO SEROPOSITIONING)</b>	15%
H.S. diploma/GED (or lower)	34%		
Some college	42%		
College degree or more	24%		
<b>AGE</b>	25.1 yrs		
<b>INCOME OF 20K/YEAR OR LESS</b>	69%		
<b>EMPLOYMENT STATUS</b>			
Working	33%		
Student	27%		
Unemployed	40%		
<b>HIV STATUS</b>			
HIV-positive	25%		
HIV-negative	73%		
<b>TESTED FOR HIV IN THE LAST 6 MONTHS (HIV-negative participants only)</b>	85%		

## MEASURES & ANALYSIS

- Project LogOn (PL) measures
  - Sexual encounter characteristics: substance use, partner characteristics, setting, feelings during the encounter, etc.
  - CES-D: 20-item scale widely used to assess depressed affect;  $R_{\text{Change}}=0.93$ ,  $R_{\text{Betw}}=0.94$
  - FAHI: 3 subscales comprised of 28 items measuring physical, social, and emotional well-being;  $R_{\text{Change}}=0.96$ ,  $R_{\text{Betw}}=0.98$
  - Sexual risk behavior: Condomless anal intercourse (CAI), serodiscordant CAI
- BCS measures
  - Sexual encounter characteristics: substance use, partner characteristics, setting, feelings during the encounter, etc.
  - K-10: Short 10-item scale used to assess depressive symptoms/anxiety;  $R_{\text{Change}}=0.99$ ,  $R_{\text{Betw}}=0.85$
  - POMS: Short subscales assessing mood (depression, anxiety, anger, calm, vigor; POMS Depression:  $R_{\text{Change}}=0.77$ ,  $R_{\text{Betw}}=0.97$
  - Sexual risk behavior: Serodiscordant CAI, serodiscordant CAI without seropositioning (high HIV transmission risk)
- Analyses of PL & BCS diary data distinguished within-person associations from between-person associations
  - Level 1 (within-person) predictors: deviations from each participant's mean
  - Level 2 (between-person) predictors: person-level means, centered at the grand mean of the sample

# PROJECT LOGON: SITUATIONAL PREDICTORS OF SEXUAL RISK BEHAVIOR

**Table 1** Findings from generalised linear mixed models (GLMMs)<sup>†</sup> predicting unprotected anal intercourse (UAI) episodes using situational predictor variables

Situational variables	All episodes (n = 258), n (%)	UAI episodes (n = 124)		UAI episodes with serodiscordant or unknown status partners (n = 37)	
		n (%)	OR (95% CI)	n (%)	OR (95% CI)
Drug use					
Drug use by self	127 (49%)	76 (61%)	2.3 (1.1 to 4.7)*	19 (51%)	1.4 (0.6 to 3.4)
Drug use by partner <sup>‡</sup>	112 (54%)	66 (66%)	2.8 (1.3 to 6.4)**	13 (50%)	1.1 (0.4 to 2.9)
Drug use by self and partner <sup>‡</sup>	102 (41%)	61 (52%)	2.4 (1.1 to 5.1)*	11 (33%)	0.9 (0.4 to 2.4)
Partner characteristics					
Met partner online	72 (28%)	50 (40%)	<b>4.3 (1.8 to 10.4)**</b>	18 (49%)	<b>2.9 (1.2 to 7.5)*</b>
Partner represented physical ideal	168 (65%)	74 (60%)	0.8 (0.4 to 1.7)	19 (51%)	0.6 (0.2 to 1.4)
Feelings about partner					
Strong emotional attraction	164 (64%)	71 (57%)	0.7 (0.3 to 1.4)	18 (49%)	0.8 (0.3 to 1.8)
Strong sexual attraction	230 (89%)	107 (86%)	0.8 (0.3 to 2.2)	27 (73%)	<b>0.3 (0.1 to 0.9)*</b>
Sexual encounter characteristics					
Discussions about HIV/ condom use	172 (67%)	68 (55%)	<b>0.4 (0.2 to 0.8)**</b>	18 (49%)	0.5 (0.2 to 1.2)
Multiple sex partners	38 (15%)	25 (20%)	2.2 (0.8 to 5.8)	5 (14%)	0.9 (0.3 to 2.9)
Sex party or bathhouse setting	15 (6%)	8 (7%)	1.6 (0.4 to 7.0)	6 (16%)	<b>6.3 (1.0 to 26.9)**</b>

\*  $p \leq 0.05$ ; \*\*  $p \leq 0.01$ , **BOLD** indicates situational predictor variable was significant ( $p \leq 0.05$ ) in multivariate model; <sup>†</sup>all analyses were adjusted for participants' age and race. Analyses examining drug use situational predictor variables were adjusted for participants' drug use behaviours at baseline; <sup>‡</sup>excludes episodes in which participants indicated not knowing if their partner used drugs before or during the episode.

Wilson, Cook, McGaskey, Rowe, & Dennis, N. (2008). Situational predictors of sexual risk episodes among HIV-positive men who have sex with men. *Sexually Transmitted Infections*.

**Table 1.** Individual substances used before most recent sexual encounter and condomless anal intercourse

Variable	Unstandardized coefficients ( <i>B</i> )	Odds ratio	95% CI	Probability increase (%)
Marijuana	0.44	1.55	1.13–2.15	12
Inhalants	1.23	3.41	2.16–5.39**	28
Cocaine	1.77	5.85	2.69–12.74*	36
Crack	1.37	3.95	2.23–6.96**	30
Methamphetamines	1.10	3.00	1.68–5.36	26
Club drugs	2.38	10.79	3.57–32.57*	47

Boone, Cook, & Wilson (2013). Substance use and sexual risk behavior in HIV-positive men who have sex with men: An episode-level analysis. *AIDS & Behavior*.

## BCS: SITUATIONAL PREDICTORS OF SEXUAL RISK BEHAVIOR

- Situational factors associated with serodiscordant CAI ( $p < .05$ ):
  - Self alcohol use, drug use during the encounter
  - Partner alcohol use, drug use during the encounter
  - Friend/fuck-buddy sex partner
  - Meeting a partner online/using an app
  - Felt feelings of emotional closeness toward partner, felt in control
  - Lack of communication about condoms, HIV

Cook, Watkins., Calebs, & Wilson (2016). Attachment orientation and sexual risk behavior among young gay and bisexual Black men. *Psychology & Sexuality*

Wilson (under review). Situational predictors of condomless anal intercourse among young Black gay men in New York City. *Journal of Sex Research*.



# MENTAL HEALTH AND SEXUAL RISK

## Are Negative Affective States Associated With HIV Sexual Risk Behaviors? A Meta-Analytic Review

Nicole Crepaz and Gary Marks  
Centers for Disease Control and Prevention

This meta-analytic review examined whether negative affective states (depressive symptomatology, anxiety, anger) are associated with sexual behaviors that place people at risk for contracting or transmitting HIV. The results from 34 study samples were included in the analysis. Contrary to popular belief, the findings as a whole provide little evidence that negative affect is associated with increased sexual risk behavior. The average weighted correlation for the overall association was .05. The effect size was .03.

## EDITORIAL COMMENT

### Negative Affect and Sexual Risk Behavior: Comment on Crepaz and Marks (2001)

Seth C. Kalichman and Lance Weinhardt  
Medical College of Wisconsin

In this commentary, the authors highlight the findings of the meta-analysis by N. Crepaz and G. Marks (2001). The role of affect in sexual risk behavior, although intuitively obvious, is not well understood and has been largely ignored by HIV prevention researchers in favor of social-cognitive models of behavior. Crepaz and Marks synthesized the results from studies that have examined the relation of negative affect (e.g., depression, anxiety, anger) to sexual risk behavior and concluded that in the literature to date, these variables appear unrelated. The authors suggest that the Crepaz and Marks findings are not surprising given the methods used in the reviewed studies and suggest methodological approaches that will allow more sensitive analyses of the association between affect and sexual risk behavior.

**Key words:** sexual risk behavior, negative affect, risk predictors

- 2001 meta-analysis by Crepaz & Marks: limited support for a positive relationship between depression and sexual risk behavior
  - Effect sizes: 0.04 – 0.10
  - Similar meta-analysis with men & women living with HIV also showed limited support
- Conceptual and methodological problems plague many studies (Kalichman & Weinhardt, 2001)
  - Cross-sectional designs, global measures of depression and risk
- Cannot answer an essential within-person question: **When a person is more depressed than they usually are, are they more likely to engage in risk behavior?**

## PROJECT LOGON: MOOD AND SEXUAL RISK BEHAVIOR

### Probability of any UAI episode

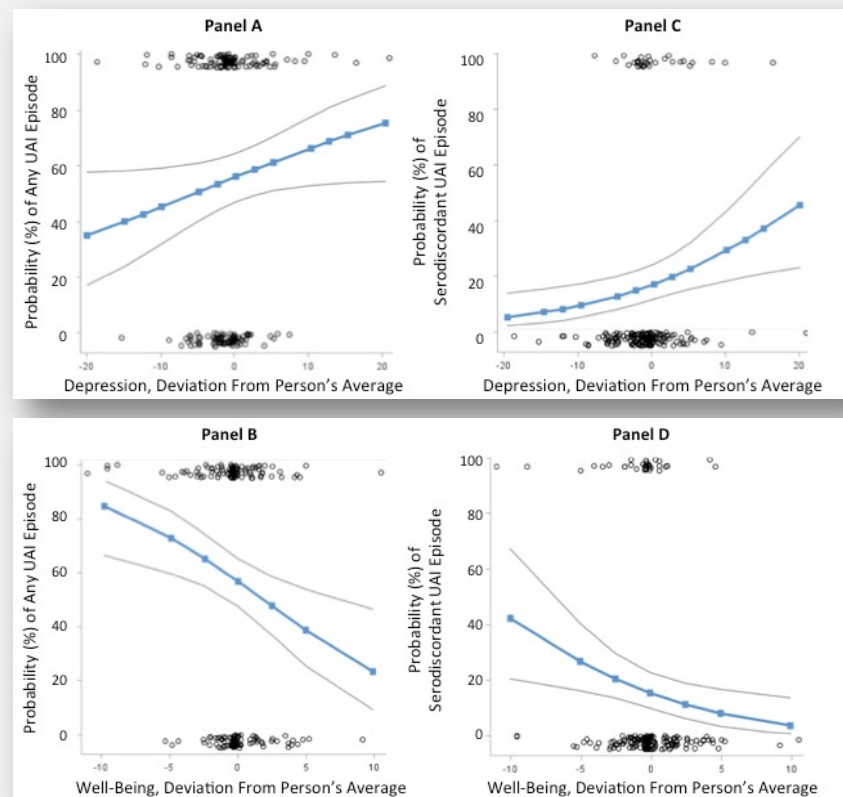
Predictor	Estimate	SE	z	p	OR	95% CI	
						Low	High
Intercept	0.26	0.18	1.45	0.148	1.29	0.91	1.83
<i>Depression_ W<sub>it</sub></i>	<b>0.53</b>	<b>0.27</b>	<b>1.97</b>	<b>0.048</b>	<b>1.71</b>	<b>1.00</b>	<b>2.90</b>
<i>Depression_ B<sub>i</sub></i>	0.22	0.19	1.17	0.241	1.25	0.86	1.80
Intercept	0.27	0.18	1.48	0.139	1.31	0.92	1.86
<i>Well-being_ W<sub>it</sub></i>	<b>-0.91</b>	<b>0.31</b>	<b>-2.95</b>	<b>0.003</b>	<b>0.40</b>	<b>0.22</b>	<b>0.74</b>
<i>Well-being_ B<sub>i</sub></i>	-0.29	0.20	-1.44	0.150	0.75	0.50	1.11

### Probability of a serodiscordant UAI episode

Predictor	Estimate	SE	z	p	OR	95% CI	
						Low	High
Intercept	-1.62	0.23	-6.96	<.001	0.20	0.13	0.31
<i>Depression_ W<sub>it</sub></i>	<b>0.91</b>	<b>0.33</b>	<b>2.77</b>	<b>0.006</b>	<b>2.49</b>	<b>1.31</b>	<b>4.73</b>
<i>Depression_ B<sub>i</sub></i>	0.01	0.22	0.06	0.950	1.01	0.66	1.57
Intercept	-1.64	0.23	-7.00	<.001	0.19	0.12	0.31
<i>Well-being_ W<sub>it</sub></i>	<b>-0.87</b>	<b>0.34</b>	<b>-2.58</b>	<b>0.010</b>	<b>0.42</b>	<b>0.22</b>	<b>0.81</b>
<i>Well-being_ B<sub>i</sub></i>	-0.06	0.21	-0.27	0.788	0.95	0.63	1.42

*Note.* Depression was measured with the Centers for Epidemiological Studies–Depression scale and well-being was measured with the Functional Assessment of HIV Infection scale.

# PROJECT LOGON: MOOD AND SEXUAL RISK BEHAVIOR



## BCS: MOOD AND SEXUAL RISK BEHAVIOR

### Serodiscordant CAI

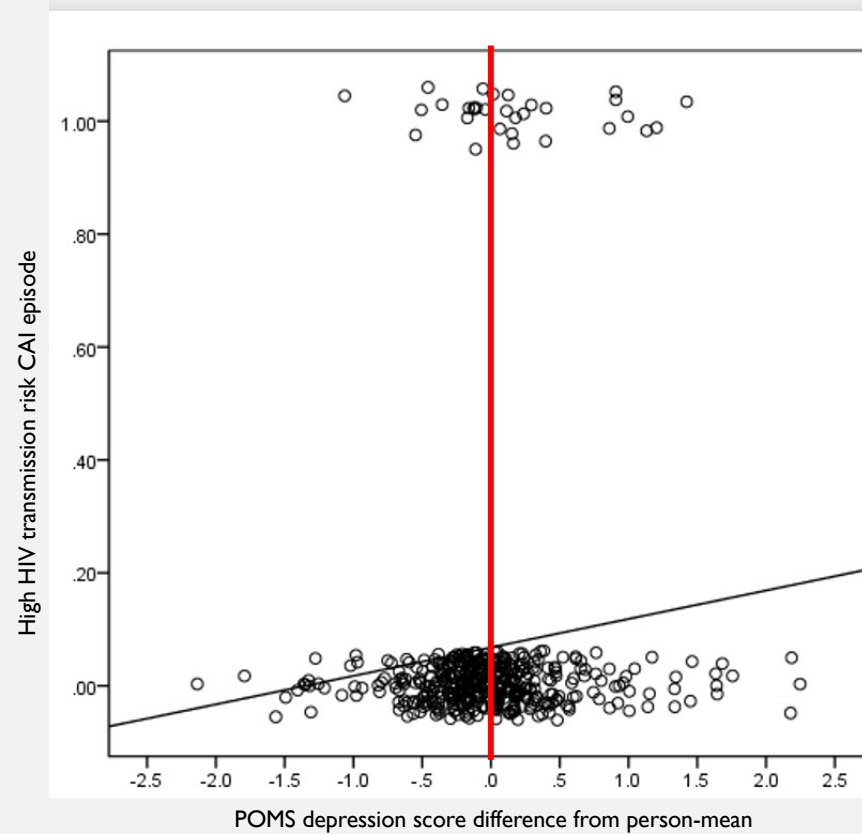
	Estimate	(SE)	df	t	p	OR	95% CI	
							Lower bound	Upper bound
Intercept	-2.55	0.22	122	-11.41	< .001	0.08	0.05	0.12
Week, centered at Week 4	0.04	0.05	123	0.78	0.44	1.04	0.94	1.15
Between-person depression, assessed with K10	<b>0.56</b>	<b>0.21</b>	<b>122</b>	<b>2.63</b>	<b>0.01</b>	<b>1.74</b>	<b>1.15</b>	<b>2.65</b>
Within-person depression, assessed with K10	<b>0.36</b>	<b>0.16</b>	<b>123</b>	<b>2.25</b>	<b>0.03</b>	<b>1.43</b>	<b>1.04</b>	<b>1.95</b>
Intercept	-2.65	0.24	122	-11.22	< .001	0.07	0.04	0.11
Week, centered at Week 4	0.06	0.05	123	1.10	0.27	1.06	0.96	1.17
Between-person depression, assessed with POMS	0.24	0.24	122	1.01	0.31	1.27	0.80	2.02
Within-person depression, assessed with POMS	<b>0.77</b>	<b>0.16</b>	<b>123</b>	<b>4.69</b>	<b>&lt; .001</b>	<b>2.16</b>	<b>1.56</b>	<b>2.98</b>

## BCS: MOOD AND SEXUAL RISK BEHAVIOR

### High HIV Transmission Risk CAI

							95% CI	
	Estimate	(SE)	df	t	p	OR	Lower bound	Upper bound
Intercept	-4.34	0.33	122	-13.19	< .001	0.01	0.01	0.03
Week, centered at Week 4	0.05	0.05	123	1.06	0.29	1.06	0.95	1.17
Between-person depression, assessed with K10	<b>0.82</b>	<b>0.29</b>	<b>122</b>	<b>2.78</b>	<b>0.01</b>	<b>2.26</b>	<b>1.27</b>	<b>4.04</b>
Within-person depression, assessed with K10	<b>0.37</b>	<b>0.14</b>	<b>123</b>	<b>2.54</b>	<b>0.01</b>	<b>1.44</b>	<b>1.08</b>	<b>1.92</b>
Intercept	-4.53	0.34	122	-13.25	< .001	0.01	0.01	0.02
Week, centered at Week 4	0.05	0.05	123	1.10	0.27	1.05	0.96	1.16
Between-person depression, assessed with POMS	0.48	0.32	122	1.47	0.14	1.61	0.85	3.05
Within-person depression, assessed with POMS	<b>1.07</b>	<b>0.17</b>	<b>123</b>	<b>6.44</b>	<b>&lt; .001</b>	<b>2.93</b>	<b>2.10</b>	<b>4.08</b>

## BCS: MOOD AND SEXUAL RISK BEHAVIOR



## PROJECT LOGON: MOOD AND SEXUAL RISK BEHAVIOR

Affect Code	Example	% (n)
Happiness/Feeling good	"great. It was someone I've had the hots for, for a long time."	46% (174)
Closeness/Feelings of intimacy	"It was a fun afternoon of sex. I felt close to him and we shared our mutual interest in filming and exhibitionism..."	6% (24)
Horniness/Arousal	"I was extremely aroused, as I had not seen my partner for several days. I don't have strong feelings of emotional closeness during sex--it's mostly just pure sexual arousal."	22% (81)
Sexual Attraction	"Felt sexually attracted to partner."	6% (22)
Anxiety/Depression/Stress	"a little stress"	8% (31)
Relief from anxiety/depression/stress	"Hadrn't eaten much and didn't have the greatest day up until that point. After the sex I felt relieved."	3% (12)
Needs fulfillment	"I had feelings of fulfillment."	5% (17)
Post-sex negative feeling	"Before the encounter I feel very good, emotionally. After the encounter I did not feel the same sense of well being."	6% (23)
Indifferent/Uneventful	"i felt as i always do, fine, but being very curious in the matter."	15% (57)

Men's affective states prior to/during sexual encounters (n=376)

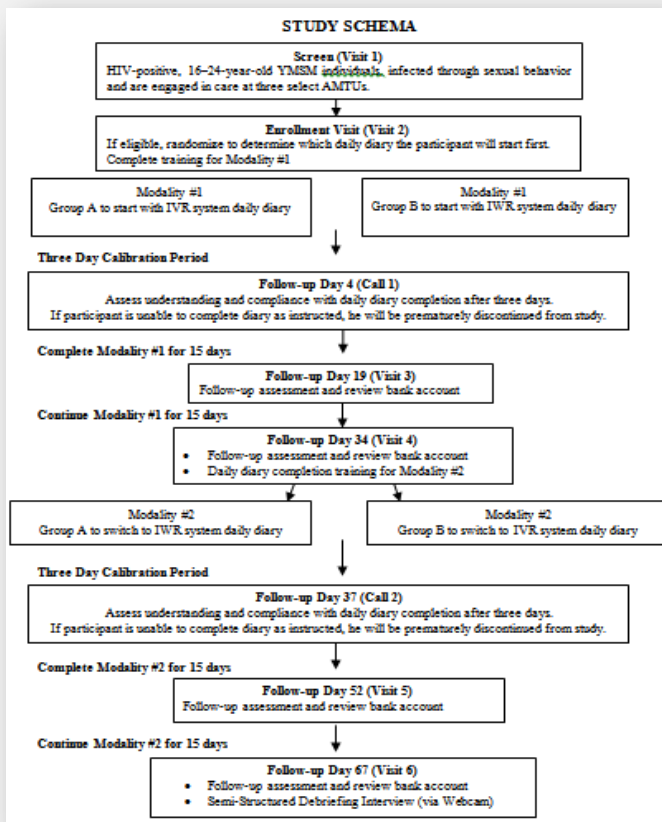
## PROJECT LOGON: MOOD AND SEXUAL RISK BEHAVIOR

Affect Variables	UAI		Serodiscordant UAI	
	O.R.	95% C.I.	O.R.	95% C.I.
Happiness/Feeling good	1.17	0.67 - 2.04	0.67	0.35 - 1.29
<b>Closeness/Feelings of intimacy</b>	<b>0.31**</b>	<b>0.12 - 0.79</b>	<b>0.17<sup>t</sup></b>	<b>0.02 - 1.29</b>
<b>Horniness/Arousal</b>	<b>1.90*</b>	<b>1.02 - 3.54</b>	<b>2.39**</b>	<b>1.19 - 4.83</b>
Sexual attraction	0.93	0.31 - 2.74	1.62	0.50 - 5.19
<b>Anxiety/Depression/Stress</b>	1.92	0.83 - 4.46	<b>2.60*</b>	<b>1.10 - 6.13</b>
Relief from anxiety/ depression/stress	2.07	0.43 - 9.82	1.31	0.32 - 5.41
Needs fulfillment	0.74	0.20 - 2.73	1.55	0.34 - 6.96
Post-sex negative feeling	0.72	0.25 - 2.14	1.19	0.34 - 4.11
Indifferent/Uneventful	0.60	0.28 - 1.30	0.45	0.16 - 1.30



# ATN 112: EXAMINING SAME-DAY SUBSTANCE USE & MOOD

# STUDY DESIGN



- ATN 112: *Feasibility of Using a Structured Daily Diary to Assess Mood, Stressful Events, Support, Substance Use, and Sexual Behavior in HIV-Positive Young MSM*
  - Data collected between 2013-2014
- Examined the feasibility and acceptability of using two daily diary methods to analyze state-dependent variables and psychosocial health outcomes
- Used to explore daily (co)variation in substance use and mood

## STUDY DESIGN

- N = 67, from three ATN sites:
  1. Children's Hospital of Philadelphia
  2. Wayne State University
  3. University of Colorado, Denver
- Eligibility Criteria:
  - HIV-infected (behaviorally)
  - 16 - 24 years old
  - MSM (Identified as male at time of birth and screening, sex with a man in past year)
  - Consistent phone/internet access
  - At least one episode of unprotected intercourse and/or two episodes of illicit drug/alcohol use in past 90 days

## SAMPLE CHARACTERISTICS (N=67)

- Race/ethnicity:
  - 61% Black/AA
  - 18% White
  - 13% Mixed Race
  - 11.9% Hispanic/Latino
- Mean age = 21, range 16-24
- 95.5% male-to-male HIV transmission
- Person-level vs. day-level observations
  - Person-level: N = 61 HIV+ YMSM
  - Day-level: n = 2,558 fully completed daily diaries

## MEASURES & ANALYSIS

- Profile of Mood States – Adolescent (POMS-A; McNair, Lorr, & Droppleman, 1971): The POMS-A is a shortened version of the POMS and assesses six mood states: Anxiety, Depression, Anger, Vigor, Fatigue, and Confusion. The POMS-A has been shown to be a reliable (Cronbach's alphas = 0.75 - 0.90) and valid measure for use with diverse adolescent populations (Terry, et al., 1999).
- Daily diary assessment: The daily diary assessment was developed with the input of the study CAB and included measures of the six primary outcome constructs (mood, stressful events, social support, substance use, adherence, and sexual behavior), as well as current perceived physical well being and positive life events.
- Analyses: Linear mixed models differentiating within-person fluctuations in substance use from between-person differences in substance use likelihood across the 60 days of the study,

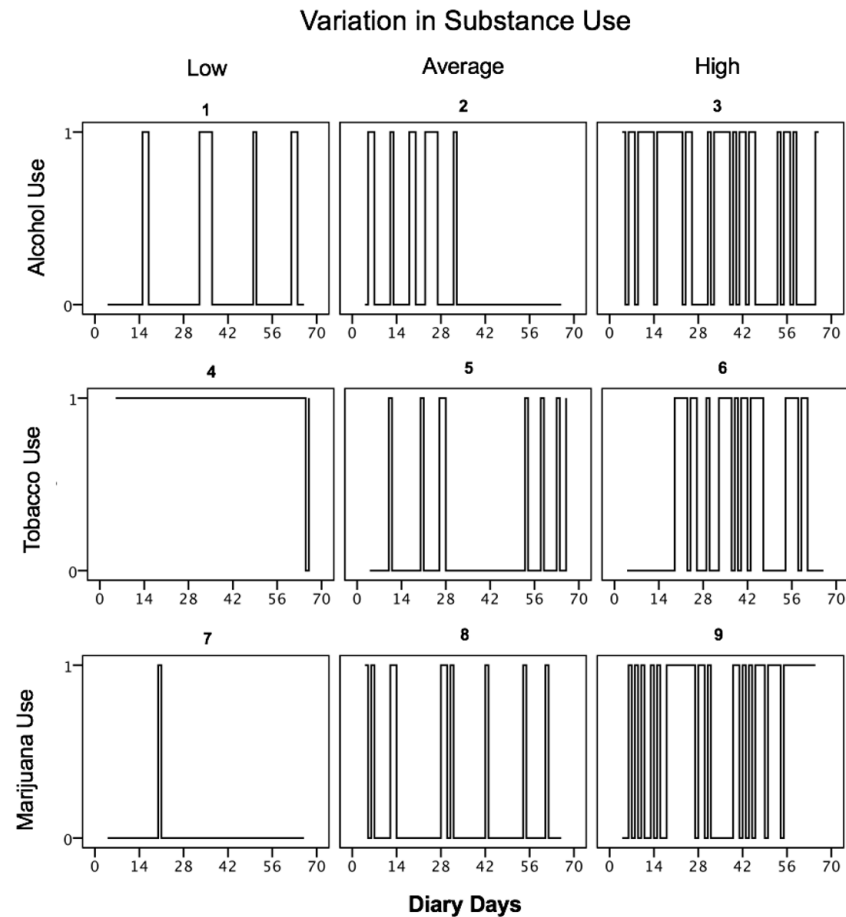
## ATN 112 DESCRIPTIVE FINDINGS

Table 1. Frequencies, means, and variability in substance use and affect for study participants and across all study days

	Participants			Days		
	<i>N</i>	% / <i>M</i>	<i>SD</i>	<i>n</i>	% / <i>M</i>	<i>SD</i>
<i>Substance use – percent of days used</i>						
Alcohol	61	21.6		2557	22.5	
Cigarettes	61	23.8		2533	25.0	
Marijuana	61	33.3		2562	32.2	
<i>Substance use – number of times taken on use days</i>						
Alcohol	55	3.1	2.5	574	2.7	2.8
Cigarettes	31	3.5	2.4	632	3.9	3.2
Marijuana	39	2.9	1.8	824	3.3	3.4
<i>Affect</i>						
Happiness	61	2.9	0.8	2595	2.9	1.2
Calm	61	2.7	0.7	2593	2.8	1.1
Anxious	61	1.6	0.6	2597	1.6	0.8
Depressed	61	1.6	0.5	2596	1.6	0.8

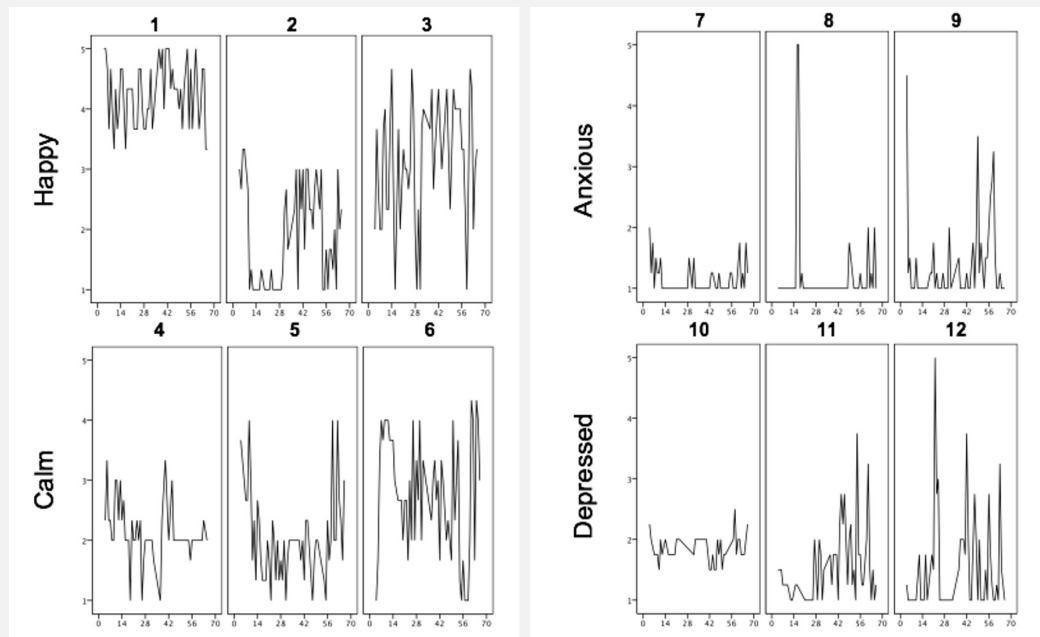
# ATN 112 DESCRIPTIVE FINDINGS

- Figure 1. Variation in participants' substance use over 60 days. The X-axis on the panels represent diary days, the Y-axis represents no use (coded 0) and use (coded 1). Alcohol use is exhibited in panels 1, 2, and 3, tobacco use in panels 4, 5, and 6, and marijuana use in panels 7, 8, and 9. Panels 1, 4, and 7 show low variation, panels 2, 5, and 8 show average variation, and panels 3, 6, and 9 show high variation in use over time.



## ATN I12 DESCRIPTIVE FINDINGS

- Figure 2. Variation in participants' affect levels over 60 days. The X-axis on the panels represent diary days, the Y-axis represents mean level of affect (with scores ranging from 1.0 to 5.0). Happy affect is exhibited in panels 1, 2, and 3, calm affect in panels 4, 5, and 6, anxious affect in panels 7, 8, and 9, and depressed affect in panels 10, 11, and 12. Panels 1, 4, 7, and 10 show low variation, panels 2, 5, 8, and 11 show average variation, and panels 3, 6, 9, and 12 show high variation in affect over time.





## ATN 112 FINDINGS: SUBSTANCE USE AND MOOD

Table 2. Fixed effects estimates for multilevel model of typical level of (between-person) and daily fluctuations in (within-person) substance use as predictors of four types of affect<sup>a</sup>

	<i>Happiness</i>			<i>Calm</i>			<i>Anxious</i>			<i>Depressed</i>		
	$\beta$	95% CI	<i>p</i>	$\beta$	95% CI	<i>p</i>	$\beta$	95% CI	<i>p</i>	$\beta$	95% CI	<i>p</i>
<i>Alcohol (N=55, 90.2%)</i>												
Typical level of use	<b>1.00</b>	<b>(-0.16, 2.16)</b>	<b>0.09</b>	<b>1.22</b>	<b>(0.20, 2.25)</b>	<b>0.02</b>	<b>0.80</b>	<b>(-0.04, 1.64)</b>	<b>0.06</b>	0.16	(-0.69, 1.01)	0.71
Daily fluctuations in use	<b>0.11</b>	<b>(0.01, 0.21)</b>	<b>0.03</b>	<b>0.10</b>	<b>(-0.01, 0.21)</b>	<b>0.07</b>	<b>-0.05</b>	<b>(-0.12, 0.01)</b>	<b>0.10</b>	-0.02	(-0.08, 0.05)	0.62
<i>Nicotine (N=31, 50.8%)</i>												
Typical level of use	-0.21	(-1.06, 0.64)	0.61	-0.36	(-1.14, 0.42)	0.35	<b>-0.71</b>	<b>(-1.34, -0.08)</b>	<b>0.03</b>	-0.26	(-0.82, 0.31)	0.36
Daily fluctuations in use	-0.02	(-0.16, 0.12)	0.74	-0.05	(-0.18, 0.07)	0.41	0.04	(-0.08, 0.16)	0.50	<b>0.11</b>	<b>(0.01, 0.20)</b>	<b>0.03</b>
<i>Marijuana (N=39, 63.9%)</i>												
Typical level of use	0.11	(-0.68, 0.89)	0.79	0.00	(-0.71, 0.72)	1.00	-0.36	(-0.88, 0.17)	0.18	<b>-0.10</b>	<b>(-0.18, -0.03)</b>	<b>0.00</b>
Daily fluctuations in use	<b>0.15</b>	<b>(0.00, 0.29)</b>	<b>0.05</b>	0.06	(-0.07, 0.19)	0.33	0.05	(-0.04, 0.14)	0.24	0.01	(-0.01, 0.03)	0.26

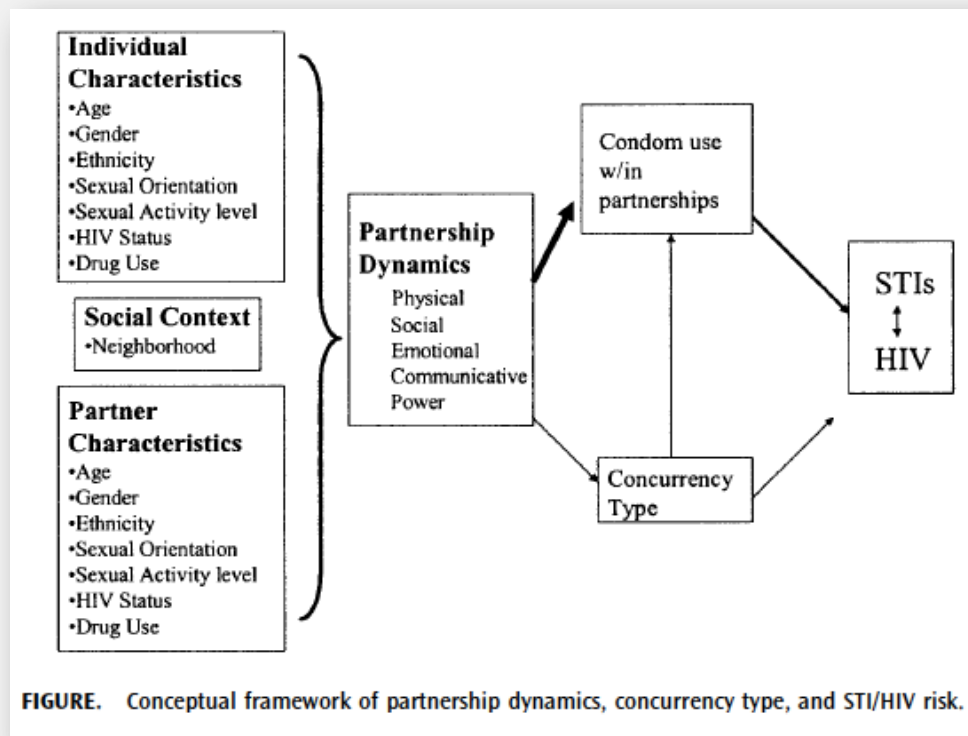
<sup>a</sup> Each of the models included effects for intercepts, though they are not reported in the table.

## ATN 112 FINDINGS: SUBSTANCE USE AND SEXUAL RISK BEHAVIOR

	UAVI		Serodiscordant UAVI		Receptive serodiscordant UAI		Insertive serodiscordant UAI	
	Between-person	Within-person	Between-person	Within-person	Between-person	Within-person	Between-person	Within-person
<b>Alcohol</b>								
<b>Nicotine</b>							-	
<b>Marijuana</b>		-					-	+
<b>Other drugs</b>				-				

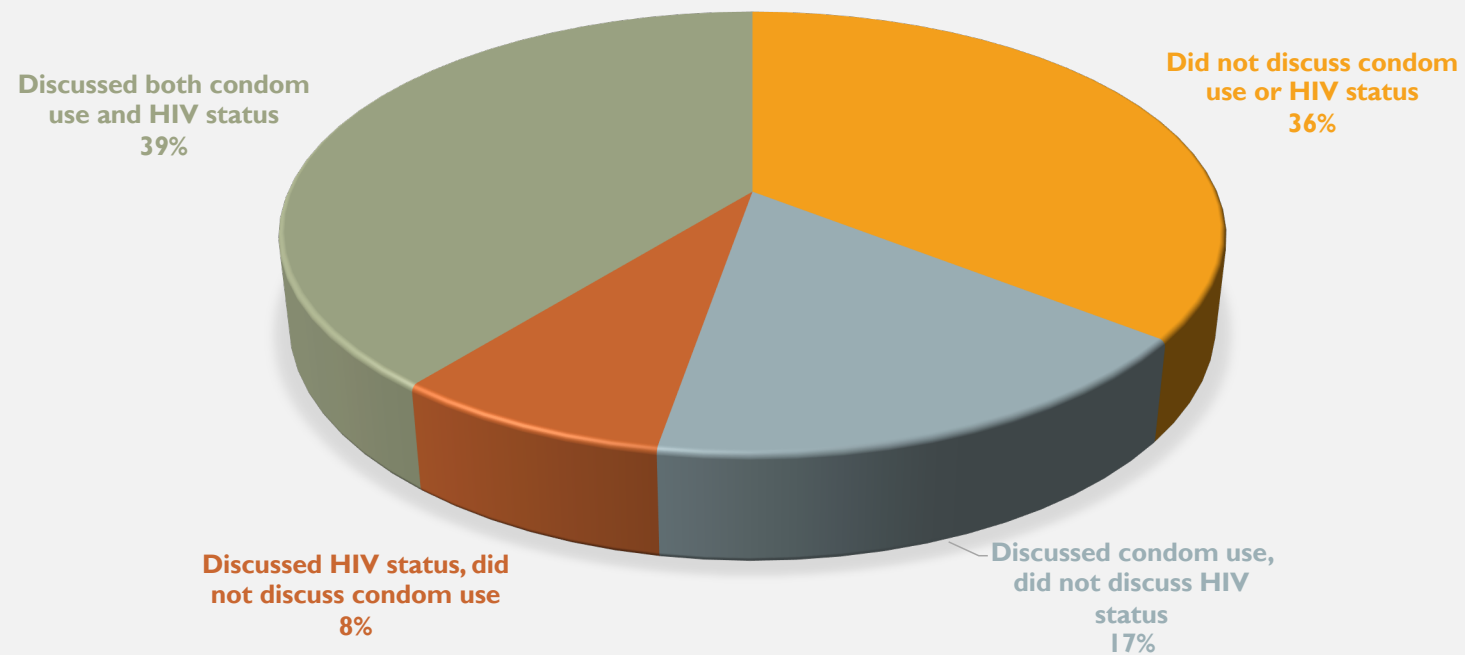
# NEXT STEPS AND CONCLUSIONS

## WHY SITUATIONS MATTER: EXAMINING SEX PARTNERS



Gorback & Holmes (2003). Transmission of STIs/HIV at the partnership level: Beyond individual-level analyses.  
*Journal of Urban Health.*

## BCS: SEXUAL ENCOUNTER CHARACTERISTICS (N=469)



Wilson, Martos, & Knox (under review). Situational predictors of sex partner communication among young Black men who have sex with men: an episode-level analysis. *STIs*.

## BCS: SITUATIONAL PREDICTORS OF PARTNER COMMUNICATION

Situational Variable	Mean (SD) / n (%)	Discussed condom use (n=264, 56.3%)		Discussed HIV status (n=222, 47.3%)	
		Mean (SD) / n (%)	t (p) / $\chi^2$ (p)	Mean (SD) / n (%)	t (p) / $\chi^2$ (p)
<i>Feelings Toward Sexual Partners<sup>1</sup></i>					
Emotional closeness	1.32 (1.10)	1.35 (1.05)	-0.81 (0.42)	1.43 (1.06)	<b>-2.15 (0.03)</b>
Sexual attraction	1.69 (0.97)	1.67 (1.00)	0.47 (0.64)	1.74 (1.00)	-0.97 (0.33)
Partner physical ideal	1.54 (0.92)	1.59 (0.96)	-1.56 (0.12)	1.64 (0.96)	<b>-2.19 (0.03)</b>
<i>Partner Characteristics</i>					
Older partner	240 (51.2)	128 (48.5)	1.75 (0.19)	105 (47.3)	2.53 (0.11)
Non-primary partner	362 (77.2)	204 (77.3)	0.00 (0.96)	162 (73.0)	<b>4.25 (0.04)</b>
Definitely HIV concordant	219 (46.7)	134 (50.8)	<b>4.01 (0.05)</b>	137 (61.7)	<b>38.19 (&lt;0.01)</b>
Same-race/Black partner	272 (58.0)	140 (53.0)	<b>6.11 (0.01)</b>	114 (51.4)	<b>7.64 (0.01)</b>

<sup>1</sup> Feelings toward sexual partners were measured using a scale from 0 – 3.

Wilson & Martos (under review). Situational predictors of sex partner communication among young Black men who have sex with men: an episode-level analysis. *AIDS & Behavior*.

## SUMMARY

- Person-level analyses examining psychological distress/mood, substance use, and sexual behavior may be limited in what they tell
  - Within-person changes in key variables occurring over short timeframes (i.e., hours, days) explain changes in mood, risk behaviors
- Mental and sexual health interventions can focus on helping vulnerable individuals plan for stress and well-being
  - Developing personal/tailored plans to deal with stressors/risks, “implementation intentions” (Gollwitzer, 1999; Gollwitzer & Sheeran, 2006) for happiness
  - Addressing and intervening upon structural risk factors that negatively affect psychological well-being
- Understanding sex partner behaviors and enhancing communication with partners are essential to sexual health and mental health promotion

## LIMITATIONS AND FUTURE DIRECTIONS

- Findings from studies provide strong evidence, but still do not permit causal inference
  - Does psychological distress lead to risk or risk cause psychological distress? (Or both?)
- Methods that permit a more granular and nuanced exploration of the substance use – mood – sex risk relationship
  - Integrating technology, physiological measurements
  - Examining structural/distal risk factors in relation to depression/well-being fluctuations
  - Using advanced diary methods with overlooked, under-researched populations (e.g., justice system-involved persons)



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QUESTIONS & COMMENTS?

**THANK YOU!**

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