

Social-Cognitive Correlates of Antiretroviral Adherence among HIV-Infected Individuals

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Background

- Rates of new HIV infections remain stable (Prejean et al., 2011)
- More than 1 million HIV-infected individuals in the U.S. (CDC, 2010)
- Antiretroviral (ART) medications:
 - Improved long-term health outlook (Palella et al., 1998; Schackman et al., 2006)
- ART requires high levels of consistent adherence
- Poor ART adherence:
 - Inadequate viral suppression, development of drug-resistance (Balfour et al., 2006; Clavel & Hance, 2004; Paterson et al., 2000)



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ART Adherence

- Optimal adherence rates vary by type of drug
(Bangsberg, 2006; Bangsberg et al., 2007)
- Benchmark: 95% or greater adherence
(Krakovska & Wahl, 2007; Low-Beer et al., 2000; Paterson et al., 2000)
- Need to identify factors associated with optimal ART adherence
- Range of correlates examined:
 - Demographic characteristics
 - Mental health, substance use difficulties
 - Psychosocial functioning
 - Other health conditions



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Theories of ART Adherence

- Need for theory-driven examinations of adherence
- Theories of ART adherence:
 - Information-Motivation-Behavior Model (Fisher et al., 2006)
 - Social Problem Solving framework (Johnson et al., 2006)
 - Stress and Coping Model (Johnson et al., 2009)
- Social-Cognitive Model of ART adherence (Dilorio et al., 2009)



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Social-Cognitive Theory

- Self-efficacy:
 - Higher ART adherence rates (Catz et al., 2000; Fumaz et al., 2008)
- Outcome expectancies:
 - Negative expectancies, poorer adherence (Murphy et al., 2002; Rudy et al., 2010)
- Social-Cognitive Model of ART adherence (Dilorio et al., 2009)
 - Direct associations with ART adherence:
 - Self-efficacy
 - Depression
 - Indirect associations with ART adherence:
 - Related constructs (e.g., stigma, social support) linked via self-efficacy or depression



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Study Objectives

- Characterize rates of ART adherence
- Examine differences in ART adherence levels:
 - Demographic characteristics
 - Health status variables
- Examine the association between Social Cognitive constructs and ART adherence



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Methods: Participants

- HIV-Infected individuals (N = 116)
- Aged between 21 and 64 years old
 - M age = 45.3, SD = 8.6
- 40% Female, 58% Male, 2% Transgender
- Ethnicity:
 - 47% Caucasian
 - 43% African American
 - 4% American Indian or Alaskan Native
 - 2% Native Hawaiian or Other Pacific Islander
 - 4% Multiracial



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Methods: Participants

- Employment status:
 - 62% unemployed
- Annual income:
 - 63% had income less than \$10,000 annually
- Education level:
 - 19%: Less than high school education
 - 35%: Completed high school or GED
 - 21%: Completed advanced degree
- Years since HIV diagnosis:
 - $M = 12.3$ years, $SD = 6.2$



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Methods: Procedures

- Recruited from outpatient infectious disease clinic in Syracuse, NY
- Eligibility criteria:
 - Receiving outpatient care at clinic
 - 18 years or older
 - English speaking
 - Medically, cognitively, psychiatrically capable of participation
- Analyses limited to those currently prescribed ART medications
- Provide written informed consent
- Questionnaire via ACASI (Range: 45 min – 2 hours)



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Methods: Measures

- Demographics
 - Gender, ethnicity, age, employment status, income, education level
- Medical chart data
 - Current ART regimen, most recent viral load (detectable/undetectable), documentation of ART adherence problems
- ART adherence
 - Visual analog scale: 0-100%
 - Number of ART doses during *the past month*



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Methods: Measures

- **ART adherence self-efficacy** (Johnson et al., 2007)
 - 12-items, rate confidence on 4-point scale
- **ART outcome expectancies**
 - 6-items, rate expectancies on 4-point scale
- **ART adherence attitudes**
 - 11-items, rate agreement on 4-point scale
- **Perceived necessity of ART** (Horne et al., 2007)
 - 8-items, rate agreement on 6-point scale
- **ART adherence normative beliefs**
 - Based on what you personally believe, not just what your doctor tells you, what is a good rate of adherence? (0-100%)
 - Imagine that you have 10 doses of HIV medication to take over the next few days. For you personally, how many of these 10 doses could you miss before you really began to worry?



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Data Analyses

- Descriptive statistics
 - Health status variables
 - ART adherence
- Bivariate statistics
 - Demographic characteristics
 - Health status variables
- Logistic regression analysis
 - Dependent variable of interest: ART adherence
 - Suboptimal adherence (0), Optimal adherence (1)
 - Social-Cognitive Constructs
 - Control for demographic characteristics



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Results: Descriptive Statistics

- Time on ART:
 - 61% for more than 7 years
 - 7% for less than 1 year
- Number of prescribed ART pills/day:
 - $M = 2.6$, $SD = .96$
- Most recent viral load:
 - 72% undetectable viral load
 - 28% detectable viral load

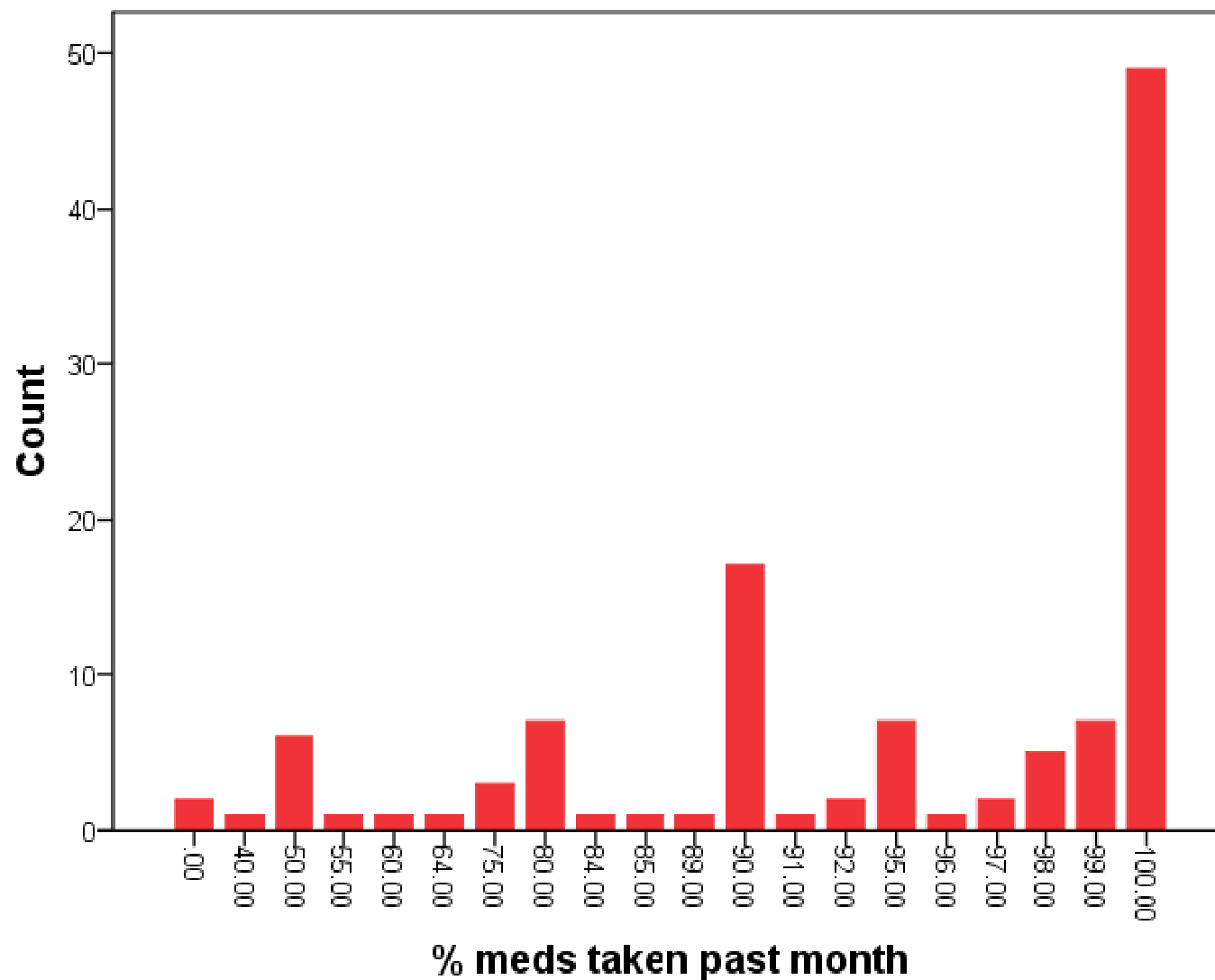


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Results: ART Adherence



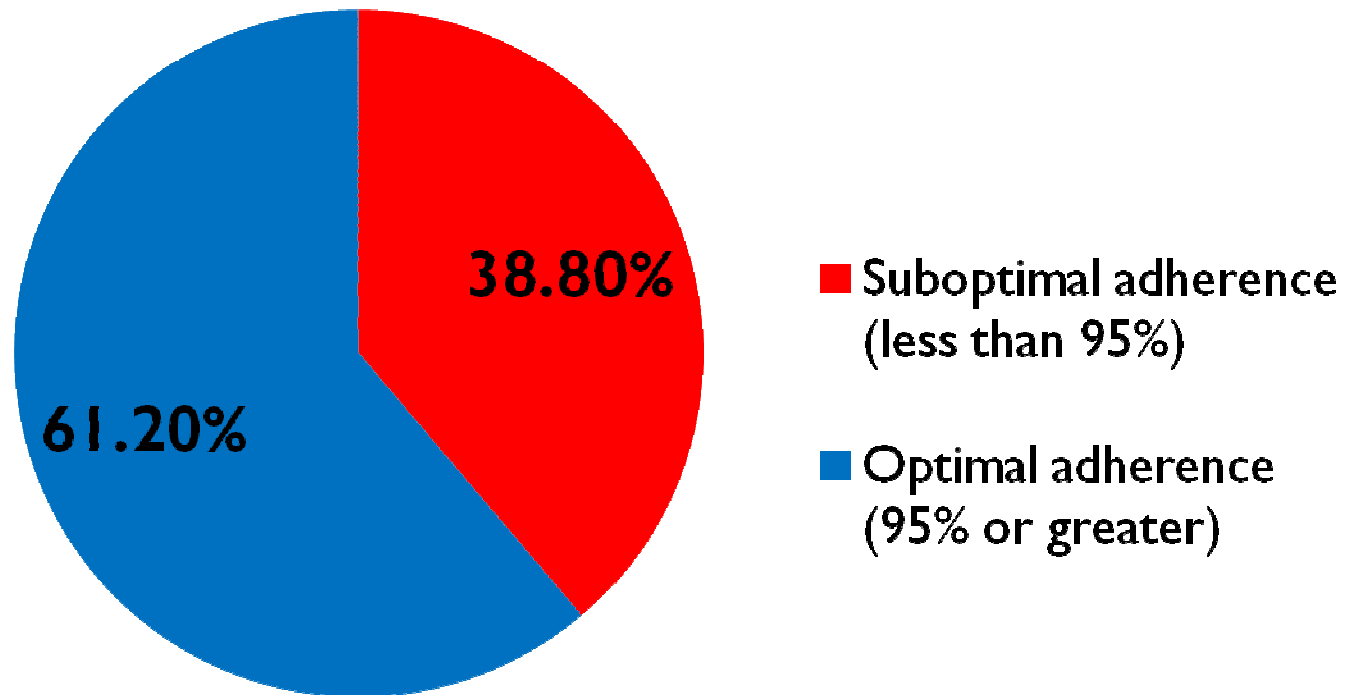
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Results: ART Adherence Levels

- Range of adherence rates: 0-100%
- $M = 89.7$, $SD = 18.2$



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Demographic & Health Status

	Suboptimal (n = 45)	Optimal (n = 71)	Test Statistic
<u>Demographic Characteristics</u>			
Age	45.6 (8.1)	45.2 (8.9)	$t = .29, p = .77$
Female gender	26 (57.8%)	23 (32.4%)	$\chi^2 = 7.3, p = .02$
Racial minority	31 (68.9%)	31 (43.7%)	$\chi^2 = 7.0, p = .01$
Currently employed	15 (33.3%)	29 (40.8%)	$\chi^2 = .66, p = .44$
<u>Health Status Variables</u>			
Detectable viral load	19 (42.2%)	13 (18.3%)	$\chi^2 = 7.9, p = .006$
Years on ART	7.0 (1.8)	5.9 (2.6)	$t = 2.5, p = .015$
Number of daily ART pills	2.9 (.81)	2.4 (1.0)	$t = 3.0, p = .003$

Note: Means (SD) for continuous variables; Frequencies (%) for dichotomous outcomes



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Social Cognitive Correlates

	OR (SE)	Lower	Upper	p
<u>Social Cognitive Constructs</u>				
ART adherence self-efficacy	1.1 (.05)	1.03	1.2	.011
ART outcome expectancies	1.1 (.08)	.92	1.3	.34
ART adherence attitudes	.95 (.04)	.88	1.0	.19
Perceived necessity of ART	1.0 (.05)	.93	1.1	.62
Normative belief for adherence level	1.3 (1.0)	1.1	1.6	.008
Intention to miss ART doses	.68 (.13)	.53	.87	.002

Note: Analyses control for gender, ethnicity



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Discussion

- Suboptimal ART adherence → Increased risk for adverse health outcomes, accelerated disease progression
- High rates of suboptimal ART adherence (39%)
- Suboptimal ART adherence associated with detectable viral load
- Women, racial minorities endorse less consistent ART adherence



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Discussion

- Higher ART adherence:
 - Greater ART adherence self-efficacy
 - Perceived normative beliefs for higher levels of ART adherence
 - Intentions to miss fewer doses
- Factors not associated with ART adherence:
 - Outcome expectancies
 - ART attitudes
 - Perceived necessity of ART



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Limitations

- Adherence measure
 - Self-report, 95% cut-off, past month
- Limitations of SCT measures
- Cross-sectional analyses, cannot infer causality
 - SCT constructs \longrightarrow ART adherence
 - ART adherence \longrightarrow SCT constructs
- Findings may not generalize to other HIV-infected populations



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Conclusions

- Potential intervention implications:
 - Address adherence barriers
 - Increase individuals' adherence self-efficacy
 - Address inaccurate beliefs regarding optimal adherence
 - Target groups at high risk for suboptimal adherence
- Assess applicability of SCT model to related HIV health behaviors
 - Comprehensive model of HIV self-care
 - Interventions grounded in SCT to improve adherence and other health behaviors



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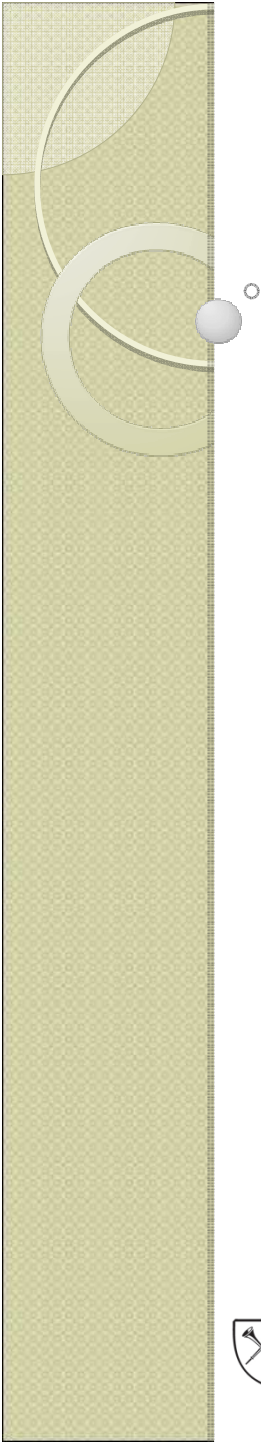
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