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**HIV TREATMENT
AND PREVENTION
ADHERENCE**

A Longitudinal Examination of Intersectional Stigma, Antiretroviral Adherence, and Viral Load

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The views expressed in this presentation are my own and may not reflect those of the funding bodies

Stigma Is

A degrading and debasing attitude of the society that discredits a person or group based on an aspect of their social identity, medical diagnosis, or participation in an undesirable behavior.

Experienced/Enacted Stigma

- overt acts of discrimination, such as exclusion, acts of physical or emotional abuse, and subtle negative treatment; acts may be within or beyond the purview of the law.
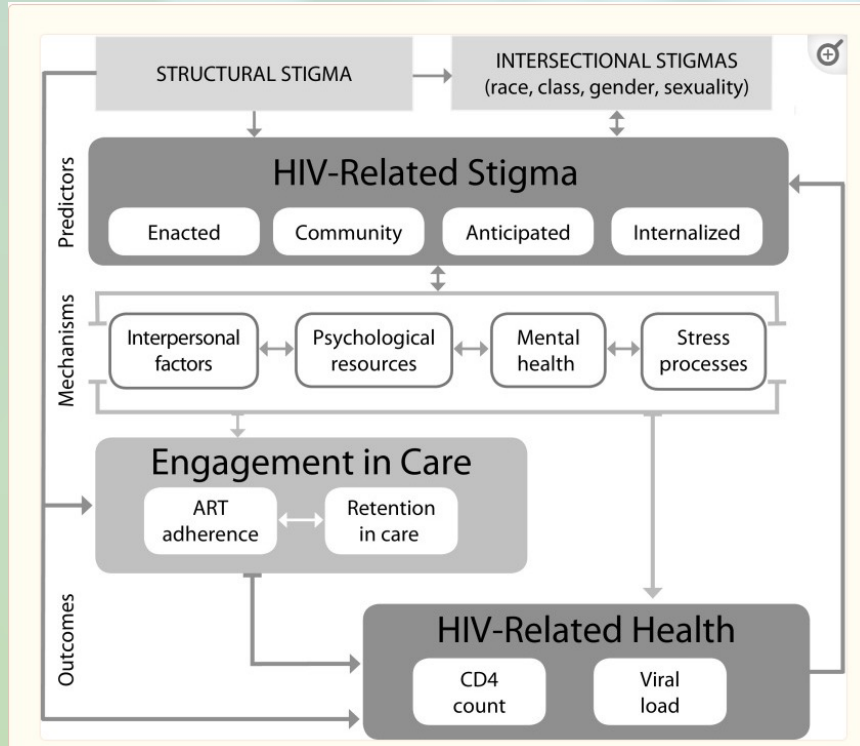
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Intersectional Stigma

- Synergistic, mutually constitutive associations between different social identities and inequities

- The intersection of HIV- and other stigmas can create unique intersectional profiles of social exclusion and marginalization, which may exacerbate social and health inequalities.
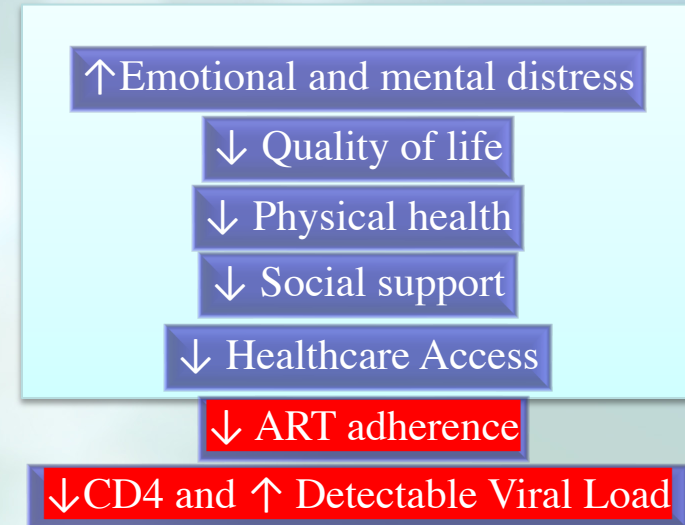
Race

Gender

Poverty

HIV

LGBTQ+

Incarceration history

Substance Use

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Conceptual Framework for HIV-Related Stigma, Engagement in Care, and Health Outcomes

STRUCTURAL STIGMA → INTERSECTIONAL STIGMAS (race, class, gender, sexuality)

Predictors

HIV-Related Stigma
- Enacted
- Community
- Anticipated
- Internalized

Mechanisms
- Interpersonal factors
- Psychological resources
- Mental health
- Stress processes

Engagement in Care
- ART adherence
- Retention in care

Outcomes

HIV-Related Health
- CD4 count
- Viral load

↑Emotional and mental distress

↓ Quality of life

↓ Physical health

↓ Social support

↓ Healthcare Access

↓ ART adherence

↓CD4 and ↑ Detectable Viral Load

Turan et al 2017

Rueda et al 2016; Armoon et al 2022

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Objectives: To explore the associations between intersectional poverty, HIV, sex, and racial stigma, adherence to antiretroviral therapy (ART), and viral suppression among women with HIV (WHIV).

Design: We examined intersectional stigmas, self-report ART adherence, and viral suppression using cross-sectional data.

Methods: Participants were WHIV ($N = 459$) in the Women's Adherence and Visit Engagement, a Women's Interagency HIV Study substudy. We used Multidimensional Latent Class Item Response Theory and Bayesian models to analyze intersectional stigmas and viral load adjusting for sociodemographic and clinical covariates.

Results: We identified five intersectional stigma-based latent classes. The likelihood of viral suppression was approximately 90% lower among WHIV who experienced higher levels of poverty, sex, and racial stigma or higher levels of all intersectional stigmas compared with WHIV who reported lower experiences of intersectional stigmas. ART adherence accounted for but did not fully mediate some of the associations between latent intersectional stigma classes and viral load.

Conclusion: The negative impact of intersectional stigmas on viral suppression is likely mediated, but not fully explained, by reduced ART adherence. We discuss the research and clinical implications of our findings.

Study Aim

To longitudinally explore the effects of intersecting HIV, race, gender, and poverty-related experienced stigma on ART adherence and viral load among women with HIV

Participants

- Women with HIV (WHIV) in the Women's Adherence and Visit Engagement (WAVE)
  - A sub-study of the Women's Interagency HIV Study (WIHS)
  - Four WIHS sites to represent different parts of the country:
    - Birmingham, Alabama
    - Jackson, Mississippi
    - Atlanta, Georgia
    - San Francisco, California
  - The collection of the data used in this study took place between (April) 2016 and (October) 2020.
    - 4 Annual Time Points (Ts)

Methods

- Identify Intersectional Classes
  - Multidimensional Latent Transition Item Response Analysis
- Explore The Longitudinal Relationship Of Intersectional Stigma And Adherence Over Time
  - Latent Markov Model path-analysis
  - Logistic and multinomial regression
  - Pairwise comparisons using Wald Tests

Multidimensional Latent Transition Item Response Theory - MLTIRT

- Integrates item response theory (IRT), latent class/Transition analysis (LCTA)

- Identifies homogenous subgroups of individuals with similar (a) levels of and (b) relationships between intersectional stigmas

- Accounts for measurement error and item contribution to measuring underlying constructs/traits (i.e., intersectional stigmas)

- Accounts for dynamic, time-varying experiences of intersectional stigmas

Norcini Pala, et al (2022)

Sample Characteristics

	Overall N = 459
Age (mean (SD))	49.06 (9.45)
White, n (%)	68 (14.8)
Non-Latina, n (%)	426 (92.8)
Highest level of education, n (%)	
1. <High school/GED	129 (28.6)
2. High school/GED	141 (31.3)
3. Some college/associate	142 (31.5)
4. College and above	39 (8.6)
Highest level of education, median (IQ)	2 [1, 3]
Average yearly household income, n (%)	
1. $12 000 or less	250 (57.1)
2. $12 001–24 000	99 (22.6)
3. $24 001–36 000	42 (9.6)
4. $36 001 or more	47 (10.7)
Average yearly household income, median [IQ]	1 [1, 2]
Viral load suppression (<20 copies/ml), n (%)	305 (67.6)
≥ 95% ART adherence over past 6 months, n (%)	350 (82.2)
Time since ART initiation, months (mean (SD))	103.74 (71.58)
Experienced intersectional stigmas raw scores (mean (SD))	
Poverty	6.05 (4.24)
HIV	16.44 (8.75)
Gender	9.07 (7.15)
Racial	2.21 (2.99)

ART, antiretroviral therapy; IQ, interquartile range; SD, standard deviation.

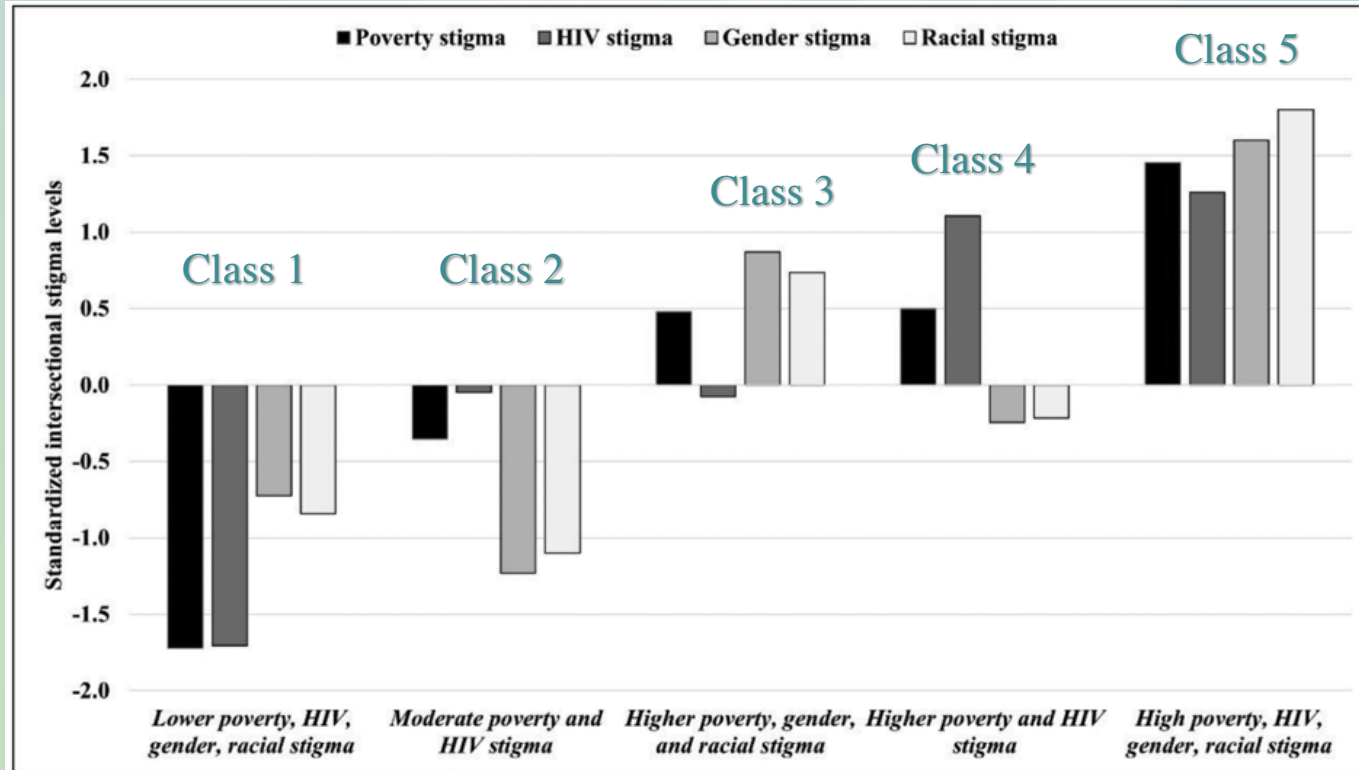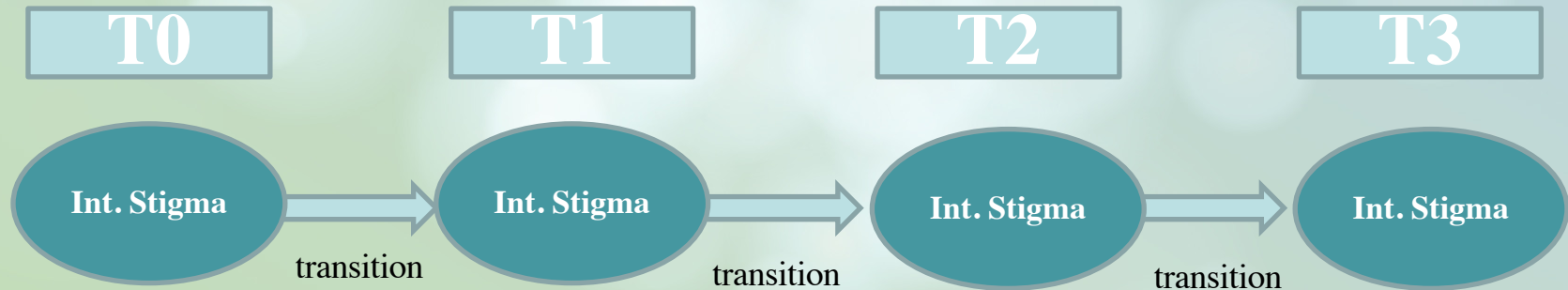# Intersectional Stigma Classes

Fig. 1. Experienced poverty-, HIV-, sex-, and racial-stigma by class. Standardized levels of experienced stigma (latent trait scores) by latent class. The overall sample mean of each experienced stigma (latent trait) is 0 because latent trait scores are standardized variables. For each class, we show experienced stigma levels higher/lower than the sample mean as indicated by standardized scores above/below 0.
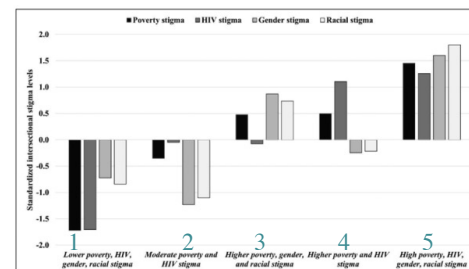
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MLTIRT - Latent transition

- Dynamic process
  - Participants can transition to other classes over time based on their experiences of intersectional stigma.

T0	T1	T2	T3

| Int. Stigma | → transition | Int. Stigma | → transition | Int. Stigma | → transition | Int. Stigma |

Intersectional stigma transition probabilities

		T				
		Class 1	**Class 2**	**Class 3**	**Class 4**	**Class 5**
T-1	**Class 1**	**0.631**	0.232	0.097	0.040	0.001
	Class 2	0.133	**0.681**	0.083	0.095	0.008
	Class 3	0.054	0.221	**0.560**	0.107	0.059
	Class 4	0.056	0.161	0.080	**0.548**	0.155
	Class 5	0.014	0.066	0.122	0.255	**0.543**

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Adherence and VL transition probabilities

ART adherence T-1	ART adherence T		
	<80%	80-90%	≥90%
<80%	**0.5706**	0.2091	0.2203
80-90%	0.2196	**0.3588**	0.4216
≥90%	0.0919	0.1715	**0.7366**

Viral Load T-1	Viral Load T	
	Undetectable	Detectable
Undetectable	**0.7734**	0.2266
Detectable	0.4158	**0.5842**

Intersectional Experienced Stigmas and Viral Load

(Ref Group Class 1)
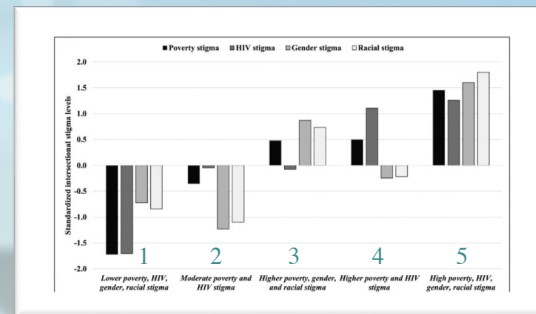
Initial state

Predictor	OR	CIs	sig
Class 1 Ref.			
Class 2	1.437	(0.68, 3.036)	0.3400
Class 3	**2.608**	(1.339, 5.079)	**0.0048**
Class 4	2.025	(0.989, 4.146)	0.0540
Class 5	1.675	(0.796, 3.526)	0.1700

IV = Independent variable; OR = odds ratios; CIs = 95% confidence interval; sig= p-value; model adjusted for covariates.
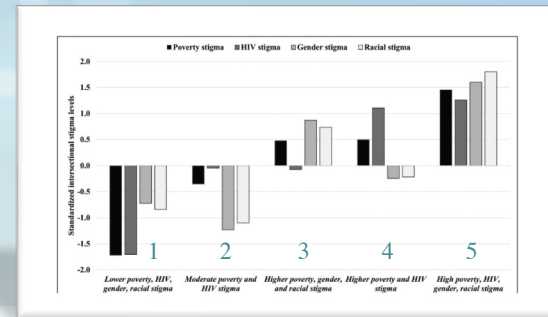
Over time

Predictor	OR	CIs	sig
Class 1 Ref.			
Class 2	0.774	(0.514, 1.164)	0.220
Class 3	1.349	(0.9, 2.022)	0.150
Class 4	0.983	(0.634, 1.525)	0.940
Class 5	**1.763**	(1.1, 2.826)	**0.019**

IV = Independent variable; OR = odds ratios; CIs = 95% confidence interval; sig= p-value; model adjusted for covariates.

Intersectional Experienced Stigmas & Viral Load
(Ref Group Class 2)

Initial state

Predictor	OR	CIs	sig
Class 2			
Class 3	**1.995**	(1, 3.98)	**0.05**
Class 4	1.199	(0.572, 2.513)	0.63
Class 5	1.140	(0.529, 2.456)	0.74

IV = Independent variable; OR = odds ratios; CIs = 95% confidence interval; sig= p-value; model adjusted for covariates.

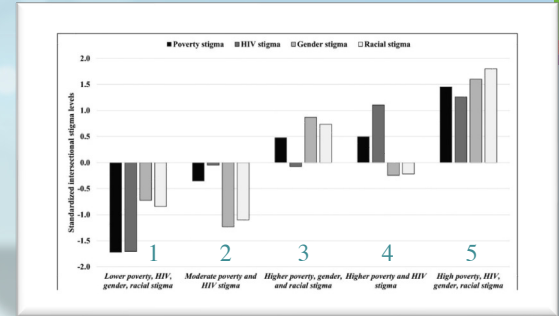### Over time

Predictor	OR	CIs	sig
Class 2			
Class 3	**1.562**	(1.074, 2.271)	**0.02000**
Class 4	1.245	(0.832, 1.864)	0.29000
Class 5	**2.108**	(1.369, 3.247)	**0.00072**

IV = Independent variable; OR = odds ratios; CIs = 95% confidence interval; sig= p-value; model adjusted for covariates.

Initial state

Predictor	DV	OR	CIs	sig
Class 1 (Ref)	≥90% (Ref)			
Class 2	80-90%	1.212	(0.523, 2.806)	0.65
Class 2	<80%	**3.018**	(1.056, 8.628)	**0.039**
Class 1 (Ref)	≥90% (Ref)			
Class 3	80-90%	**2.634**	(1.249, 5.556)	**0.011**
Class 3	<80%	**7.451**	(2.82, 19.685)	**0.00005**
Class 1 (Ref)	≥90% (Ref)			
Class 4	80-90%	1.558	(0.677, 3.583)	0.300
Class 4	<80%	**3.742**	(1.342, 10.434)	**0.012**
Class 1 (Ref)	≥90% (Ref)			
Class 5	80-90%	1.042	(0.402, 2.705)	0.930
Class 5	<80%	**8.226**	(3.032, 22.321)	**0.00004**

Intersectional stigma and Adherence

Class 1 Ref Group

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Over Time

Predictor	DV	OR	CIs	sig
Class 1 (Ref)	**≥90% (Ref)**			
Class 2	80-90%	0.978	(0.597, 1.604)	0.930
Class 2	<80%	1.01	(0.591, 1.761)	0.940
Class 1 (Ref)	**≥90% (Ref)**			
Class 3	80-90%	**1.799**	(1.085, 2.983)	**0.023**
Class 3	<80%	1.694	(0.966, 2.971)	0.066
Class 1 (Ref)	**≥90% (Ref)**			
Class 4	80-90%	1.213	(0.716, 2.054)	0.470
Class 4	<80%	1.242	(0.709, 2.177)	0.450
Class 1 (Ref)	**≥90% (Ref)**			
Class 5	80-90%	1.318	(0.712, 2.44)	0.380
Class 5	<80%	1.714	(0.948, 3.098)	0.074
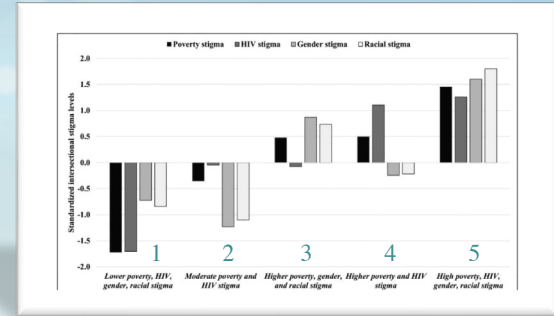
Intersectional stigma and Adherence

Class 1 Ref Group

Discussion

- 5 Different combinations of experienced intersectional stigmas are associated with viral load and adherence

- Groups were differently associated with ART adherence and detectable viral load

- Negative impact of HIV stigma on HIV treatment outcomes could be intensified when individuals also face other forms of stigma simultaneously.

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Thank you!

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Acknowledgments

WAVE study participants

A Longitudinal Examination of Intersectional Stigma, Antiretroviral Adherence, and Viral Load

Back Up Slides

Experienced Intersectional Stigma Measures

- Discrimination, unfair treatment, exclusion, and devaluation from others in diverse social contexts in the past 12 months.

    - **Experienced poverty stigma** was assessed using the 4-item subscale of the perceived poverty stigma

        - *Mickelson KD, Williams SL. (2008).*

    - **Experienced HIV stigma** was assessed with the 12-item subscale of the HIV Stigma Scale

        - *Berger BE. Et al (2001).*

    - **Experienced sex stigma** assessment comprised the 13-item scale Schedule of Sexist Events

        - *Klonoff EA, Landrine H. (1995)*

    - **Experienced racial stigma** was assessed using the 10-item experiences of discrimination scale

        - *Krieger N. et al. (2005)*
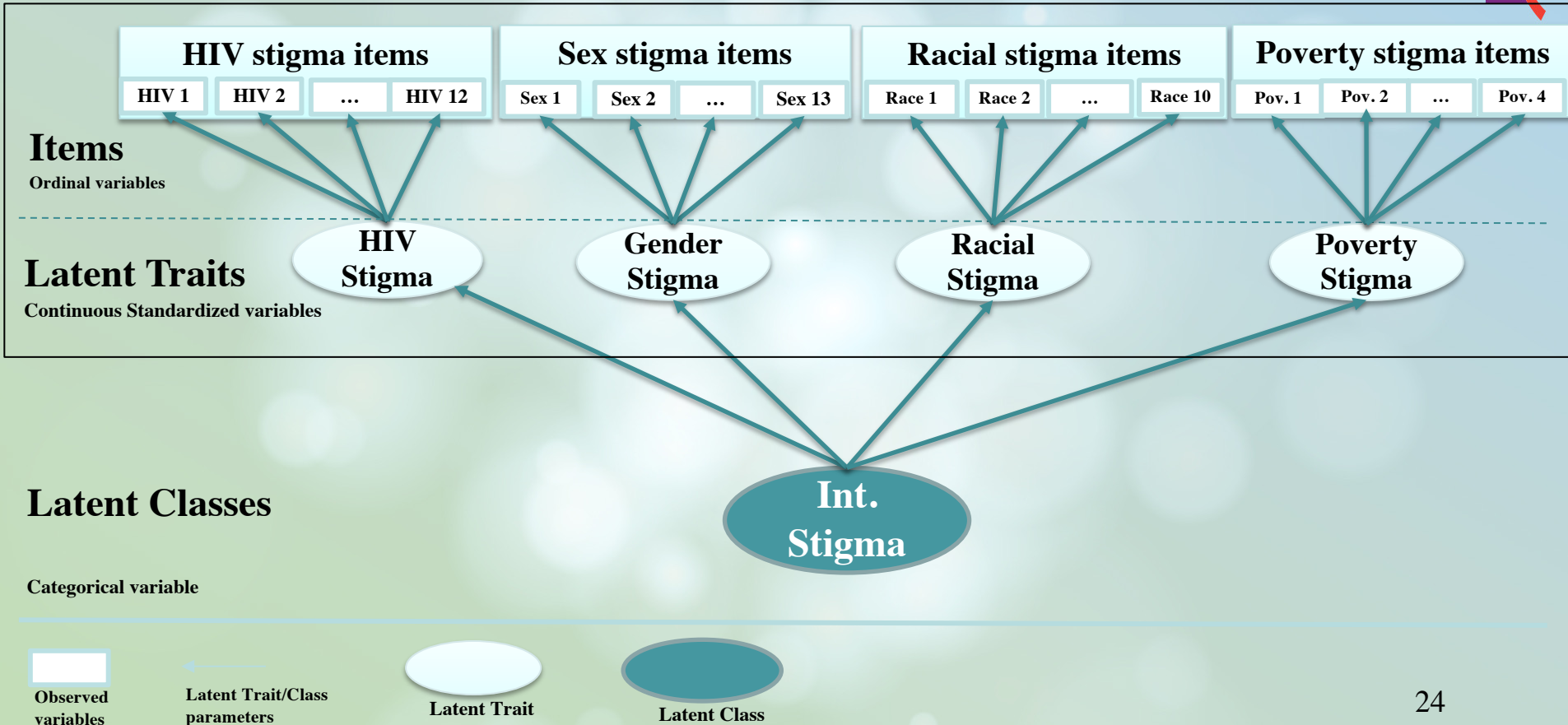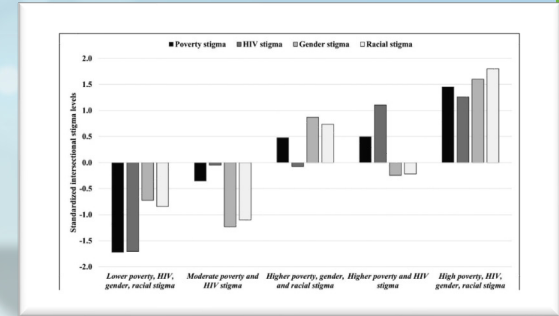
Transition probability
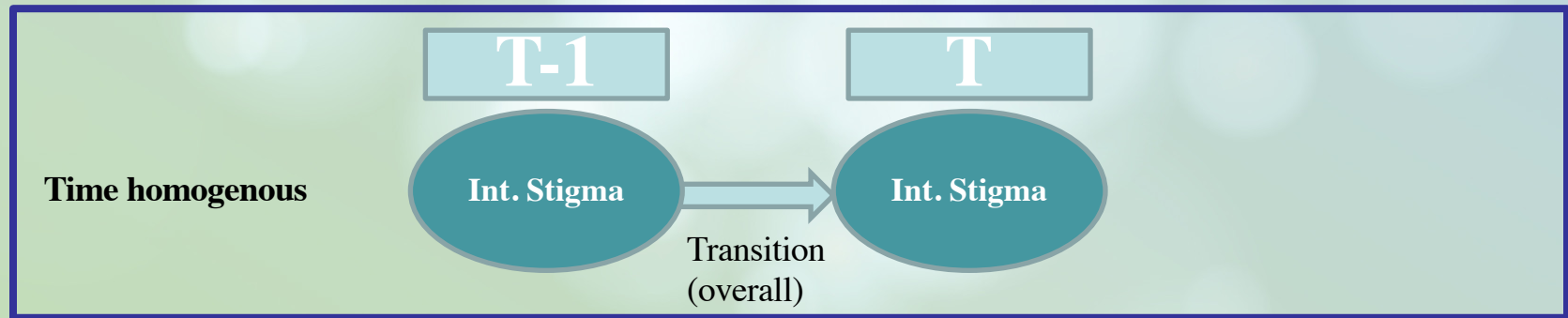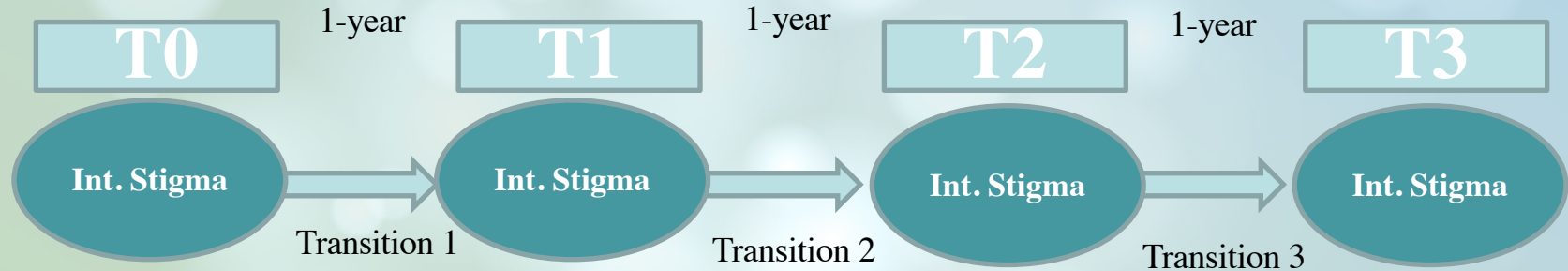
Initial State

IV	DV	OR	CIs	sig
Class 2 (Ref)	**≥90% (Ref)**			
Class 3	80-90%	**1.839**	(1.177, 2.873)	**0.0075**
Class 3	<80%	**1.660**	(0.986, 2.795)	**0.0560**
Class 2 (Ref)	**≥90% (Ref)**			
Class 4	80-90%	1.239	(0.773, 1.987)	0.3700
Class 4	<80%	1.217	(0.72, 2.057)	0.4600
Class 2 (Ref)	**≥90% (Ref)**			
Class 5	80-90%	1.347	(0.765, 2.375)	0.3000
Class 5	<80%	1.679	(0.968, 2.913)	0.0650

Intersectional stigma and Adherence

Class 2 Ref Group

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Over Time

Predictor	DV	OR	CIs	sig
Class 2 (Ref)	**≥90% (Ref)**			
Class 3	80-90%	**2.174**	(1, 4.724)	**0.050**
Class 3	<80%	**2.468**	(1.138, 5.355)	**0.022**
Class 2 (Ref)	**≥90% (Ref)**			
Class 4	80-90%	1.286	(0.543, 3.044)	0.570
Class 4	<80%	1.240	(0.531, 2.895)	0.620
Class 2 (Ref)	**≥90% (Ref)**			
Class 5	80-90%	0.860	(0.322, 2.298)	0.760
Class 5	<80%	**2.725**	(1.205, 6.162)	**0.016**
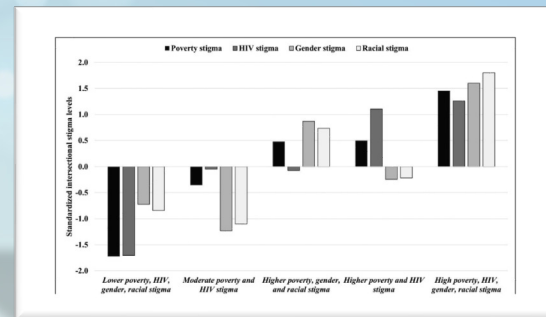
Intersectional stigma and Adherence

Class 2 Ref Group

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MLTIRT – Transition probabilities

- At baseline, a person who experienced lower intersectional stigmas over the past 12 months will belong to Class 1

- If the same person experiences some poverty and HIV stigma in the following 12 months will likely belong to Class 2 at the subsequent follow-up

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