

# Psychiatric Symptoms of Young Adult Female Indoor Tanners

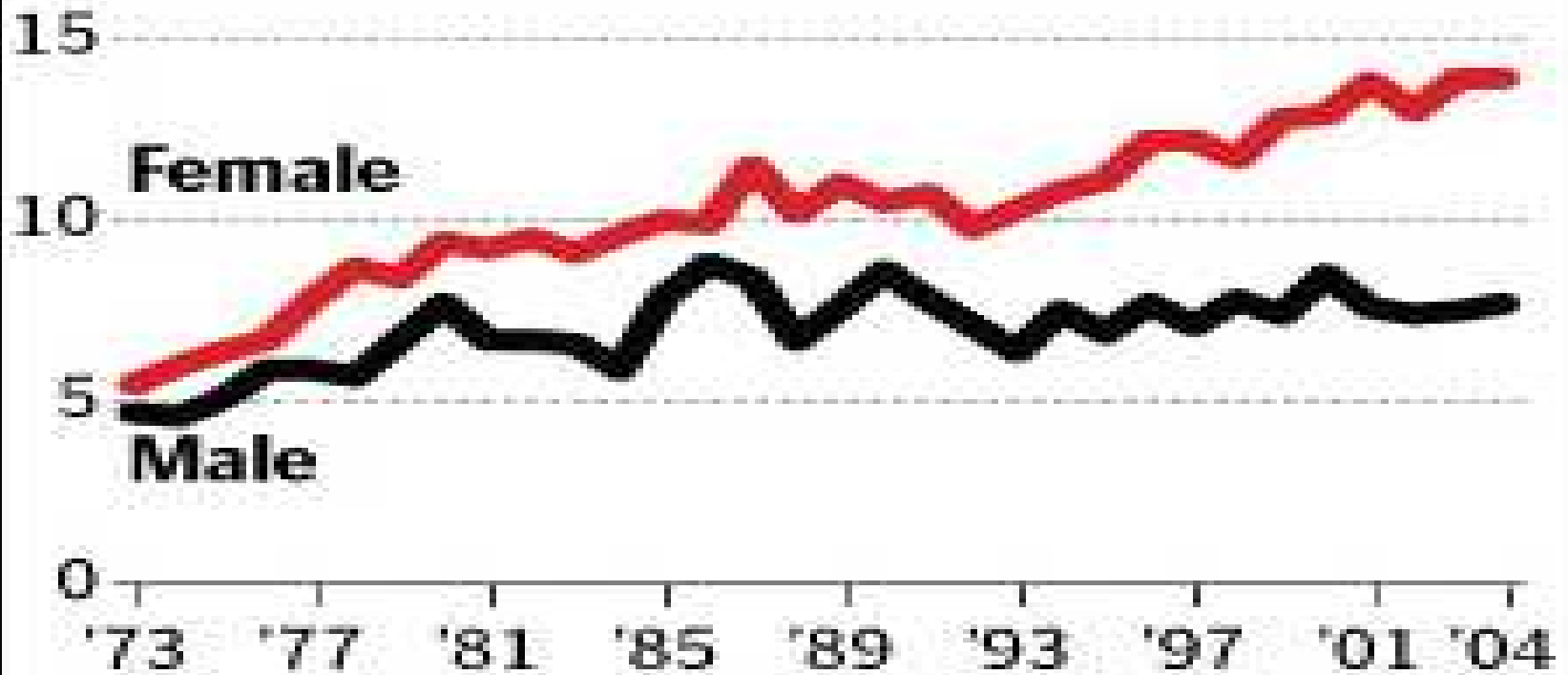
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3. Drexel University, PA
4. Cancer Institute of New Jersey



# New Cases of Skin Cancer

Per 100,000 people age 15 to 39



Source: Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute

By Elliot B. Postell — The Washington Post

# Indoor Tanning Industry



## Prevalence of indoor tanning in young adults

- 2005 National Health Interview Survey (NHIS) Data
- $N = 29,394$  US adults
- 20% in last year among 18-29 year olds
  - 27% among women, 13% among men



- Heckman, Coups, Manne. 2008. JAAD.

# What motivates people to tan?

- US public is aware of dangers of UV
  - Still high levels of exposure
  - Minimal protective behaviors
- Appearance is the primary motivation
- Social influence factors
- May also impact anxiety, mood, or addictive symptoms







# Psychosocial correlates of indoor tanning

- Tanning for mood or relaxation purposes  
(e.g., Hillhouse et al., 2007; Stapleton et al., 2010)
- Sensation-seeking, smoking, binge drinking, drugs  
(Bagdasarov et al. 2008; Ibrahim & Brown, 2008)
- 2005 NHIS Data, *N*=29,394 US adults  
(Heckman, Coups, & Manne, JAAD, 2008)
  - Health behaviors among indoor tanners under age 50
    - Current smoking, risky drinking
    - No physical activity, less than 5 servings of F/V per day
    - Not being overweight/obese
    - Other skin cancer risk behaviors (e.g., sunburns)
- Also see Coups & Phillips, JEADV, 2011 for a systematic review of correlates

# Why do some people tan so frequently?

- Tanning Dependence

- “Tanorexia”

- Warthan et al. (2005)

- mCAGE

- Cut down, annoyed, guilty, eye-openers

- mDSM-IV-TR

- Tolerance, withdrawal, out of control behavior, impairment

- Tanning Pathology Scale (TAPAS)

- Focus groups and psychometric testing

- *Dissatisfaction with Skin Color*

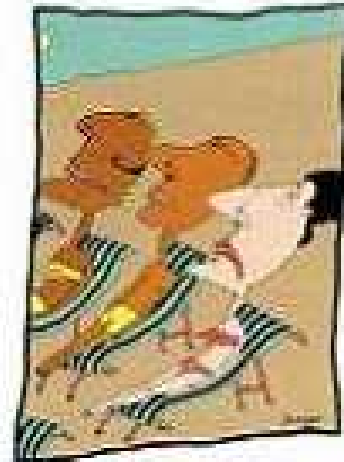
- *Indoor Tanning as a Problem*

- *Opiate-like Reactions to Tanning*

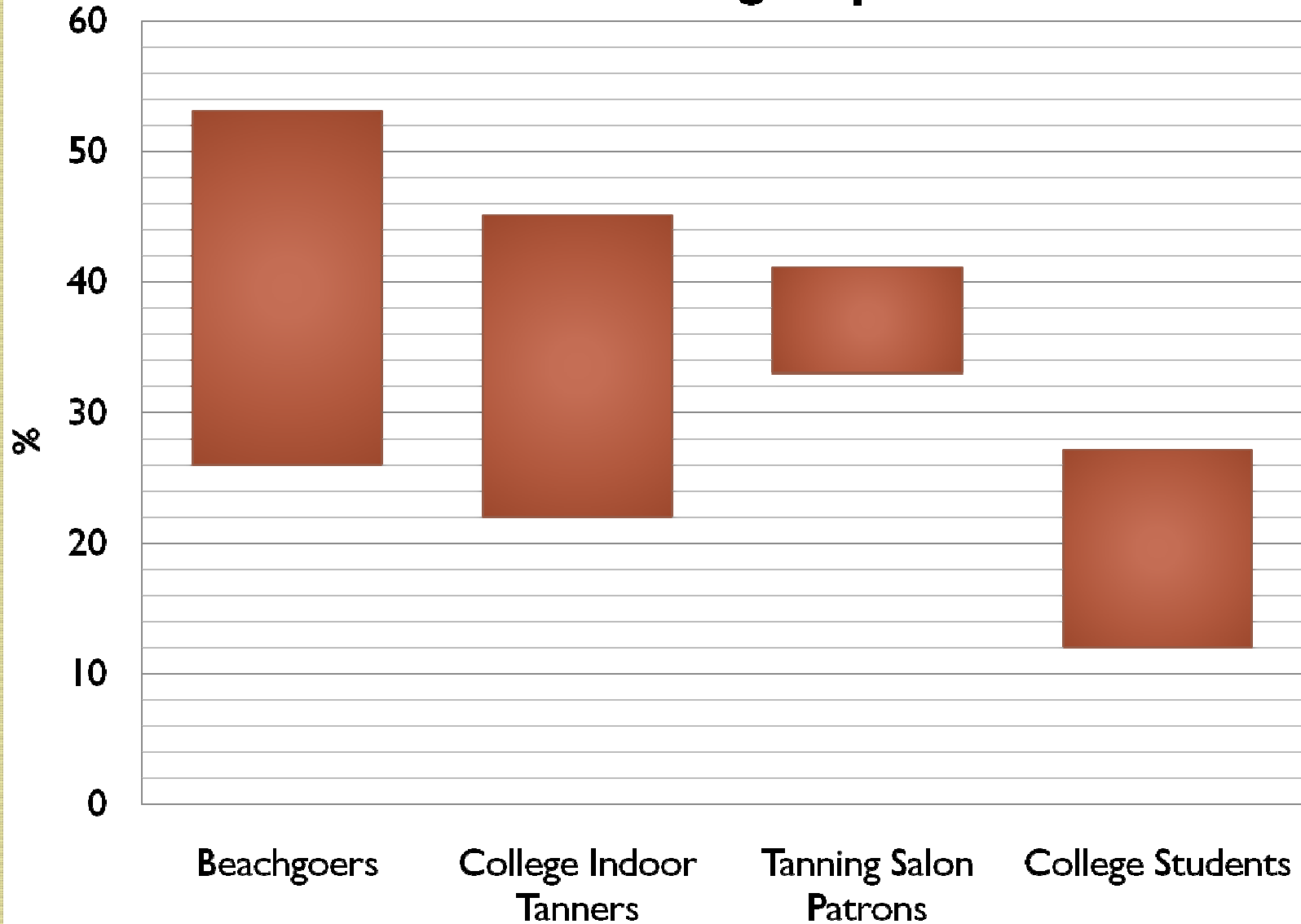
- *Tolerance to the Physiological Effects of Tanning*

- (Longacre et al., 2006; Hillhouse et al., 2007)

TANOREXIA:  
That irrational fear of  
paling by comparison



# Prevalence of Tanning Dependence

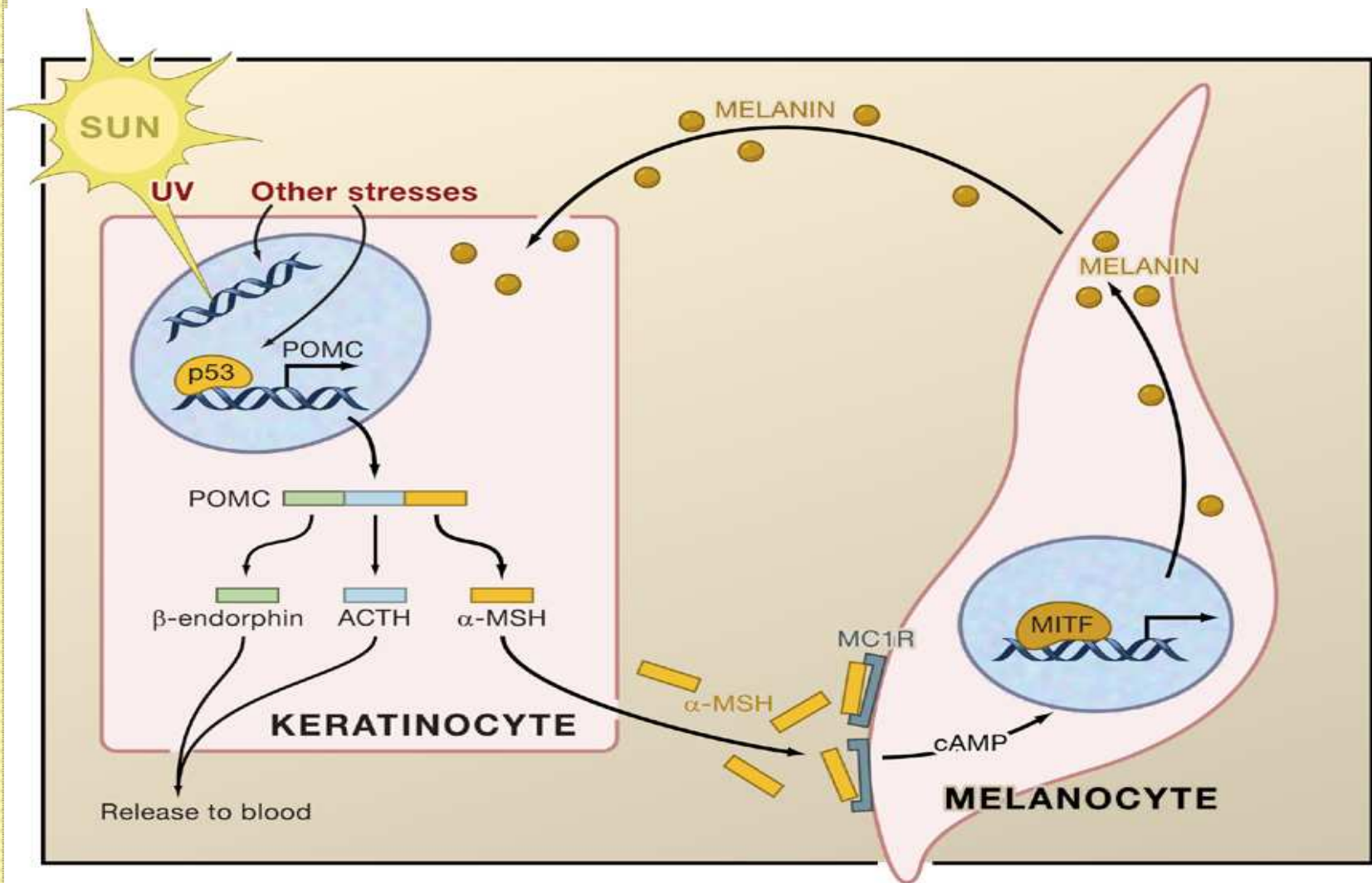


e.g., Heckman, Egleston et al., AJHB, 2008



# Proposed mechanisms of tanning dependence

(Oren & Bartek, Cell, 2007)



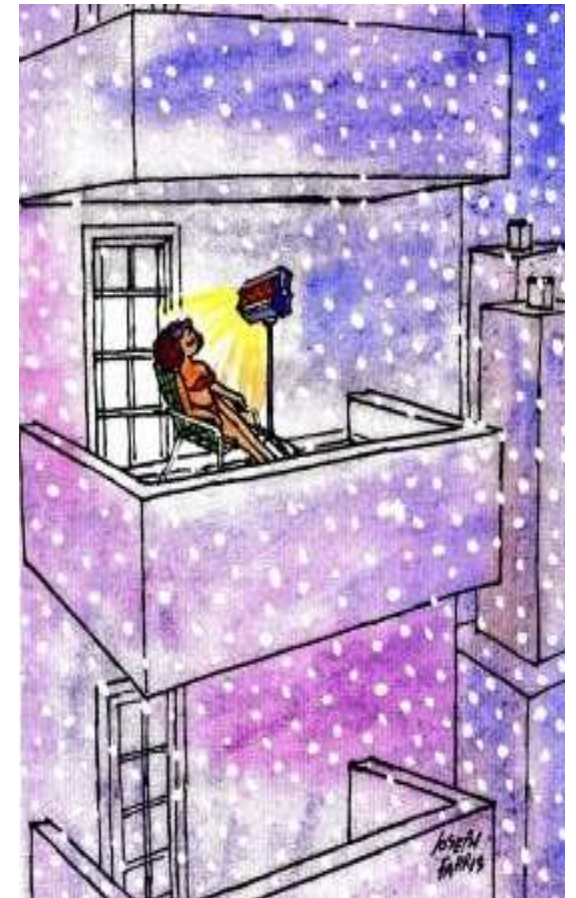


# Evidence for these mechanisms

- Release of endogenous opioids during UV exposure
- UV (vs. non UV) bed preference among blinded frequent tanners
  - Reasons were relaxation and decreased tension (Feldman et al., 2004)
- Opioid blockade (antagonist naltrexone) reduced preference
  - Withdrawal-like symptoms such as nausea, fatigue, and low concentration in frequent tanners at higher doses (Kaur et al., 2006)
- Decreased fibromyalgia pain after exposure to UV vs. non-UV (Taylor et al., 2009)
- Increased striatal activation & decreased tanning desire
  - Single photon emission tomography (SPECT) imaging
  - Tanning dependent indoor tanners in UV vs. sham (non-UV) (Harrington et al., 2011)

# Psychosocial correlates of tanning dependence

- Online survey of 400 college students
  - 38% tanned indoors, 27% TD
  - TD associated with smoking, anaerobic exercise, not being obese
  - (Heckman, Egleston, et al., AJHB, 2008)
- Survey of 421 college students
  - 56% tanned indoors
  - 39% met DSM, 31% CAGE criteria
  - TD associated with anxiety, alcohol, marijuana, other substances
  - Depression not associated with TD
  - (Mosher & Danoff-Burg, 2010)



Identifying Novel Correlates of Indoor  
Tanning Experiences: Project INCITE  
R03CAI36007







# Purpose of the Study

- To identify psychosocial correlates of indoor tanning and tanning dependence and characterize subgroups of participants
- Few studies have comprehensively assessed psychological and addictive symptoms among tanners
- No study has previously used a standardized clinical interview
- Results could inform development of interventions to address relevant psychological and addictive problems





# Participants and Methods

- Sample (n = 518)
  - Drexel University
    - SONA online psych research subject pool
  - 18-25 year old females
  - Any tanning history, 67% Caucasian
  - Fall/winter/spring recruitment
- Design
  - Cross-sectional
  - Online survey about tanning
  - eMINI International Neuropsychiatric Interview conducted by phone

# Results: Axis I Correlates of IT

- 40% indoor tanners (IT)
- Chi square analyses

Variables	IT (n = 146)	No IT (n = 174)	Overall (N = 320)	p
Substance abuse or dependence	32 (21.9%)	15 (8.6)	47 (14.7)	.001
Smoked in past 30 days	32 (21.9)	19 (10.9)	51 (15.9)	.007
Alcohol use sx	104 (71.2)	82 (47.1)	186 (58.1)	< .001
Social anxiety sx	5 (3.4)	16 (9.2)	21 (6.6)	.032
Generalized anxiety sx	33 (22.6)	14 (8.1)	47 (14.7)	<.001

- NS = any mental disorder, illicit drug use, SAD, MDD, ED, OCD, PTSD

# Results: Axis I Correlates of IT

- Multivariable logistic regression (N = 320)

Symptoms	OR (95% CI)	P
Alcohol use sx	2.72 (1.67-4.44)	<.001
Social anxiety sx	0.22 (0.07-0.75)	.015
Generalized anxiety sx	3.42 (1.69-6.92)	<.001

- Smoking no longer significant

# Results: Axis I Correlates of TD

- 25% tanning dependent (TD)
  - based on mCAGE or mDSM-IV criteria
- Chi square analyses

Variables	TD (n = 76)	Not TD (n = 230)	Overall (N = 306)	<i>p</i>
<b>Any psych diagnosis</b>	<b>47 (61.8%)</b>	<b>107 (46.5)</b>	<b>154 (49.7)</b>	<b>.020</b>
<b>Alcohol use sx</b>	<b>58 (76.3)</b>	<b>121 (52.6)</b>	<b>179 (58.5)</b>	<b>&lt; .001</b>
<b>Seasonal affective sx</b>	<b>45 (59.2)</b>	<b>104 (45.2)</b>	<b>149 (48.7)</b>	<b>.034</b>

- None of the other psych or substance variables were significant.

# Results: Axis I Correlates of TD

- Multivariable logistic regression (N = 306)

Symptoms	OR (95% CI)	P
Alcohol use sx	3.26 (1.72-6.17)	<.001
Seasonal affective sx	1.67 (0.95-2.94)	.075
Major depression sx	0.52 (0.26-1.04)	.064





# Results: Emotions Pre-Post Tanning

- Retrospective mood (PANAS) before and after last indoor tanning episode
- Factor analysis
  - Self-assurance
    - strong, proud, alert, inspired, determined, attentive, active
  - Arousal
    - interested, excited, enthusiastic
  - Anxiety
    - guilty, scared, ashamed, nervous, jittery, afraid
  - Anger
    - upset, hostile, irritable

# Results:

## Emotions Pre-Post Tanning (N = 230)

Category	Before or After Tanning	M(SD)	t	p
Self-assurance	Before	2.3 (0.9)	2.05	.042
	After	2.2 (1.0)		
Arousal	Before	2.9 (1.0)	3.77	< .001
	After	2.7 (1.0)		
Anxiety	Before	1.7 (0.8)	4.93	< .001
	After	1.5 (0.7)		
Anger	Before	1.4 (0.7)	4.11	< .001
	After	1.3 (0.7)		



# Planned Analyses

- Association of skin protection behavior with psychosocial variables
- Latent profile analyses to characterize subgroups
- Intervention design to reduce tanning and related psychosocial problems



# Conclusions about IT and TD

- Associated with anxiety, mood, and substance use
- + and - mood states decrease after tanning
  - Suggests possible numbing effect
- More than just appearance
  - Psychological, behavioral, addictive factors
- Concern for (female) children and young adults

# Shedding Light on Indoor Tanning

Heckman & Manne (Eds) 2011

<http://www.springer.com/biomed/cancer/book/978-94-007-2047-3>

1. Introduction
2. History and Culture of Tanning in the United States
3. Prevalence and Correlates of Indoor Tanning (Coups)
4. Motivations for Indoor Tanning: Theoretical Models
5. How Ultraviolet Radiation Tans Skin
6. Skin Cancer and Other Health Effects of Indoor Tanning
7. Tanning Dependence: Is tanning an addiction?
8. Selected Indoor Tanning Myths and Controversies
9. A Systematic Review of Interventions Reduce Indoor Tanning
10. Indoor Tanning Regulation, Enforcement, Taxation, and Policy
11. Sunless Tanning
12. International Perspectives on Indoor Tanning (Hay)
13. Indoor Tanning: Past, Present, and Future

