



Lower subjective social status predicts increased acute stress-induced inflammatory disinhibition

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Socioeconomic Status (SES)

Defined as:

- Income, education, occupation, and other “objective” indicators

Association with Health:

- SES is related with morbidity & mortality
(Adams & White, 2004; Marmot, 2005)
- Graded relationship (Adler et al., 1994)
- Relationship is not strictly linear
(Epidemiological paradox; Markides & Coreil, 1986)
- Precise pathways are still unknown

Subjective Social Status (SSS)

Defined as:

- Social standing relative to others in one's community and society

SSS surpasses predictive power of SES in:

- Ambulatory diastolic blood pressure (Adler et al., 2000)
- Susceptibility to the common cold (Cohen et al., 2008)
- Diabetes, angina, depression
(Singh-Manoux, Adler & Marmot, 2003)

SSS is a predictor of various health indicators:

- Self-rated health (Operario et al., 2004)
- Cortisol reactivity (Gruenewald, Kemeny & Azis, 2006)

Macarthur Foundation

Subjective Social Status (Community Ladder)



(Adler & Stewart, 2007)

Think of this ladder as representing where people stand in their communities.

People define community in different ways; please define it in whatever way is most meaningful to you. At the **top** of the ladder are the people who have the highest standing in their community. At the **bottom** are the people who have the lowest standing in their community.

Where would you place yourself on this ladder?

Please place a large "X" on the rung where you think you stand at this time in your life, relative to other people in your community.



Potential Pathway: Inflammation

Local Inflammation

- Part of innate immune response
- Necessary in immune defense and wound healing



Systemic Inflammation

- **Sepsis**
 - Life threatening
 - Septic shock (fatal)
- **Chronic low grade inflammation (CLGI)**
 - Elevated plasma concentrations of **IL-6** and CRP

Health Implications of CLGI:

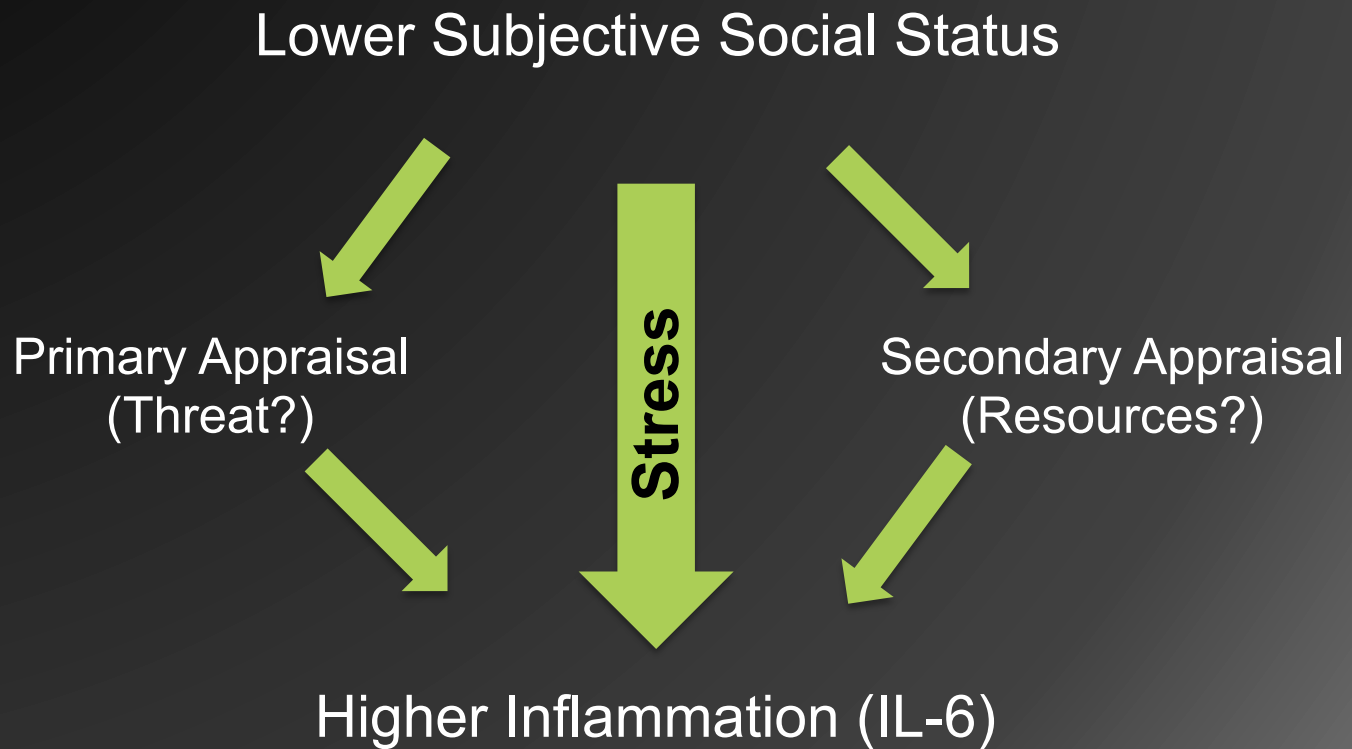
- Relationships with self-reported health
 - Positive correlations with: depression, hopelessness, vital exhaustion, distress
 - Negative correlations with: coping, self-esteem
- Relationships with age-related diseases and disease processes
 - Atherosclerosis, cardiovascular disease
 - Type 2 diabetes
 - Lymphoma, osteoporosis, Alzheimer's disease
 - Higher mortality risk, even in healthy older adults

Inflammation, SSS, and Health

- Low SSS is associated with disease
- Inflammation predicts disease

→ *How are these phenomena related?*

How does SSS impact Inflammation?



Methods

Participants

- 19 healthy men and women (57.9% male)
- Age: 18-33 years, mean 22 ± 4.25 years
- BMI: mean 23.87 ± 3.5 kg/m²
- 47.4% White, 42.1% Asian, 10.5% Black

Measures

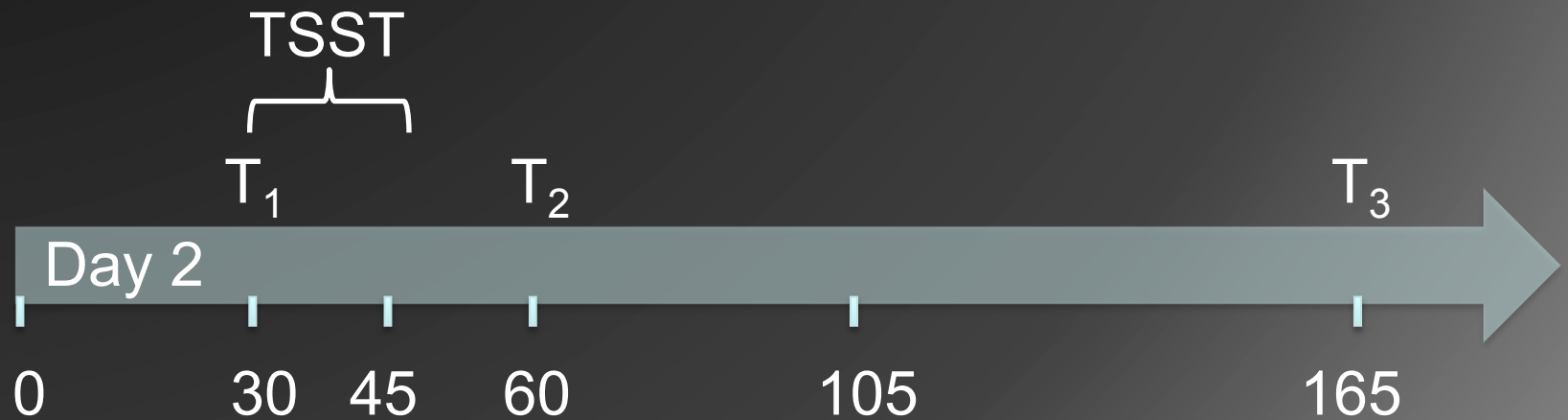
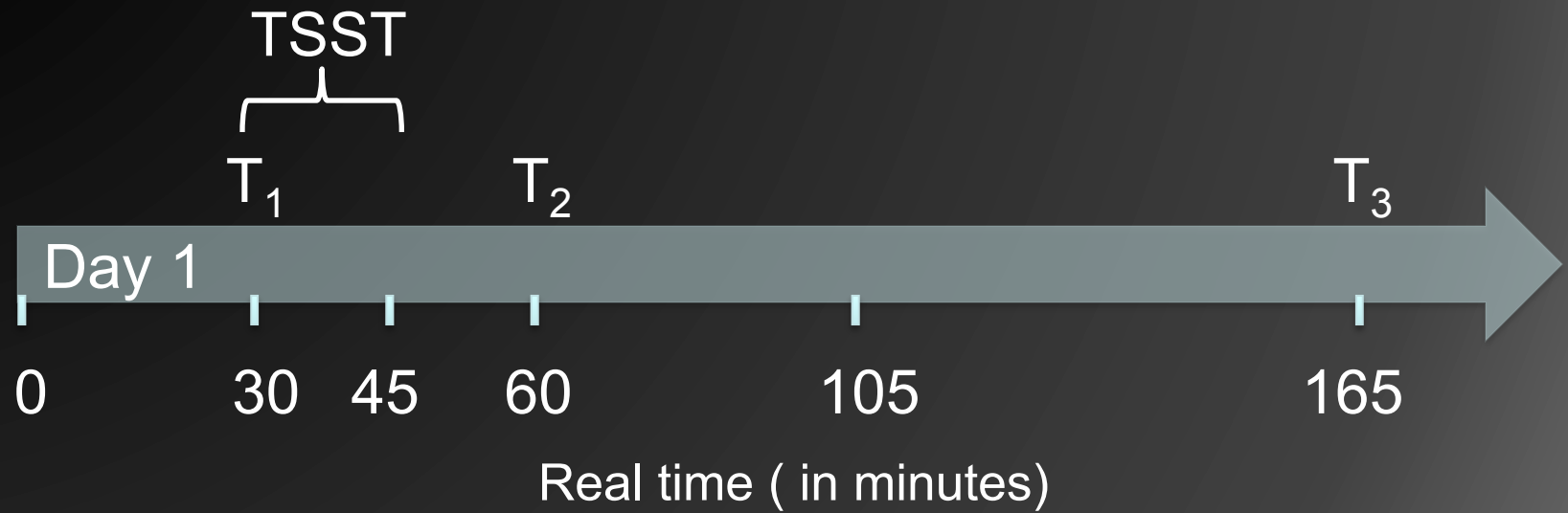
- Plasma IL-6 (3 blood samples)
- SES (education level, mother/father's degree received)
- SSS (Community + US ladders)
- PASA subscales (primary vs. secondary appraisal)

Trier Social Stress Test

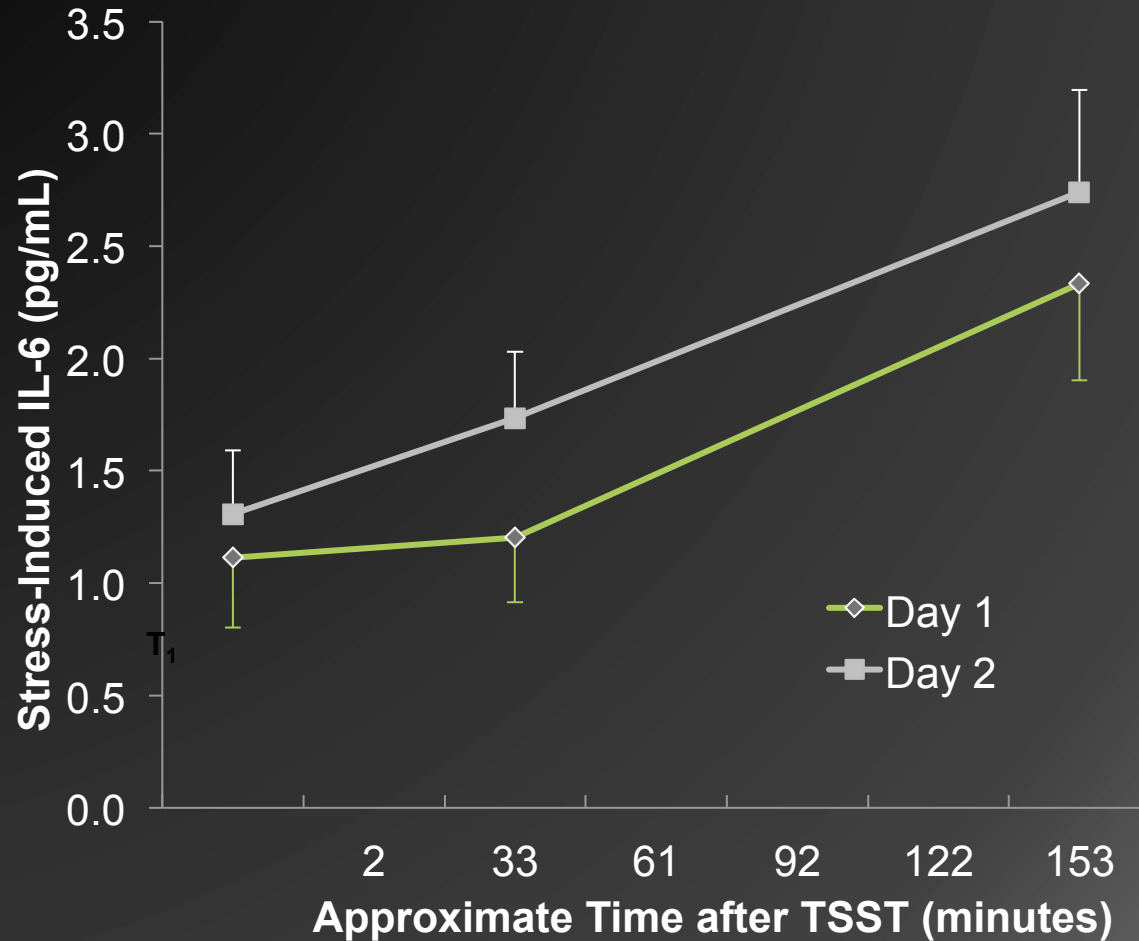


No, that was incorrect.. Please start over from 2043.

Procedure



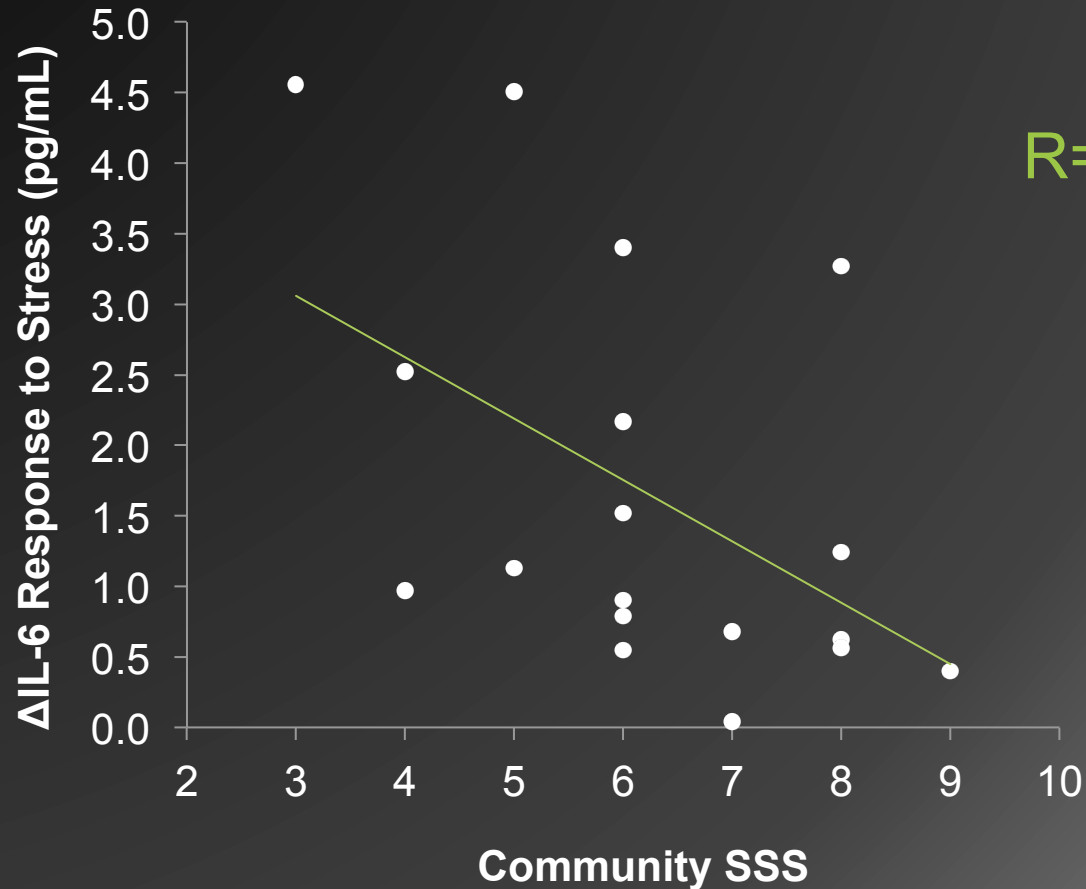
Acute-stress induced IL-6 response



Note: Δ IL-6 Response = $T_1 - T_3$

Results: Hypothesis 1

Is lower SSS is related to a higher stress-induced il-6 response?

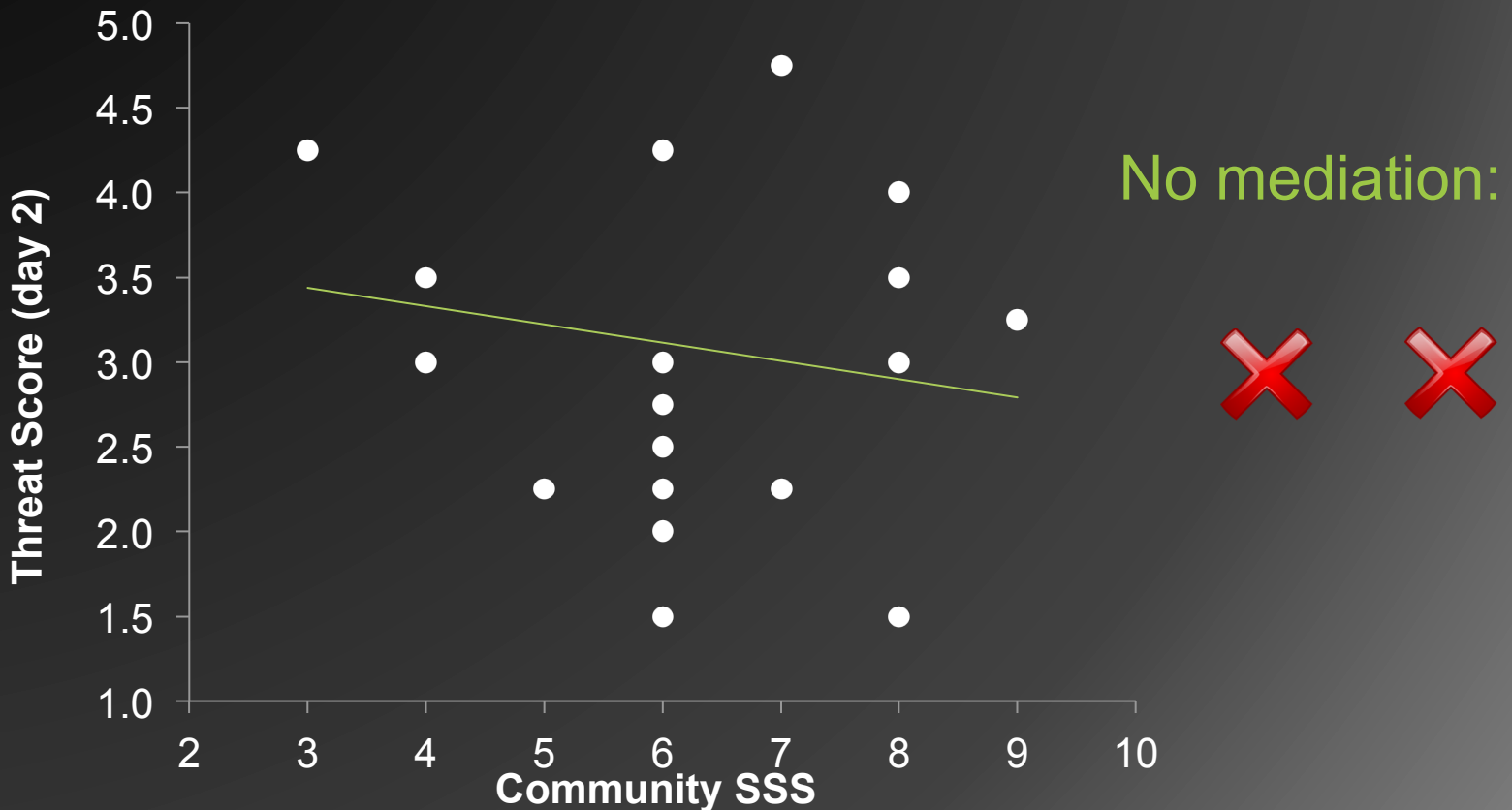


$R = -0.52, p = 0.02$



Results: Mediation by primary appraisals

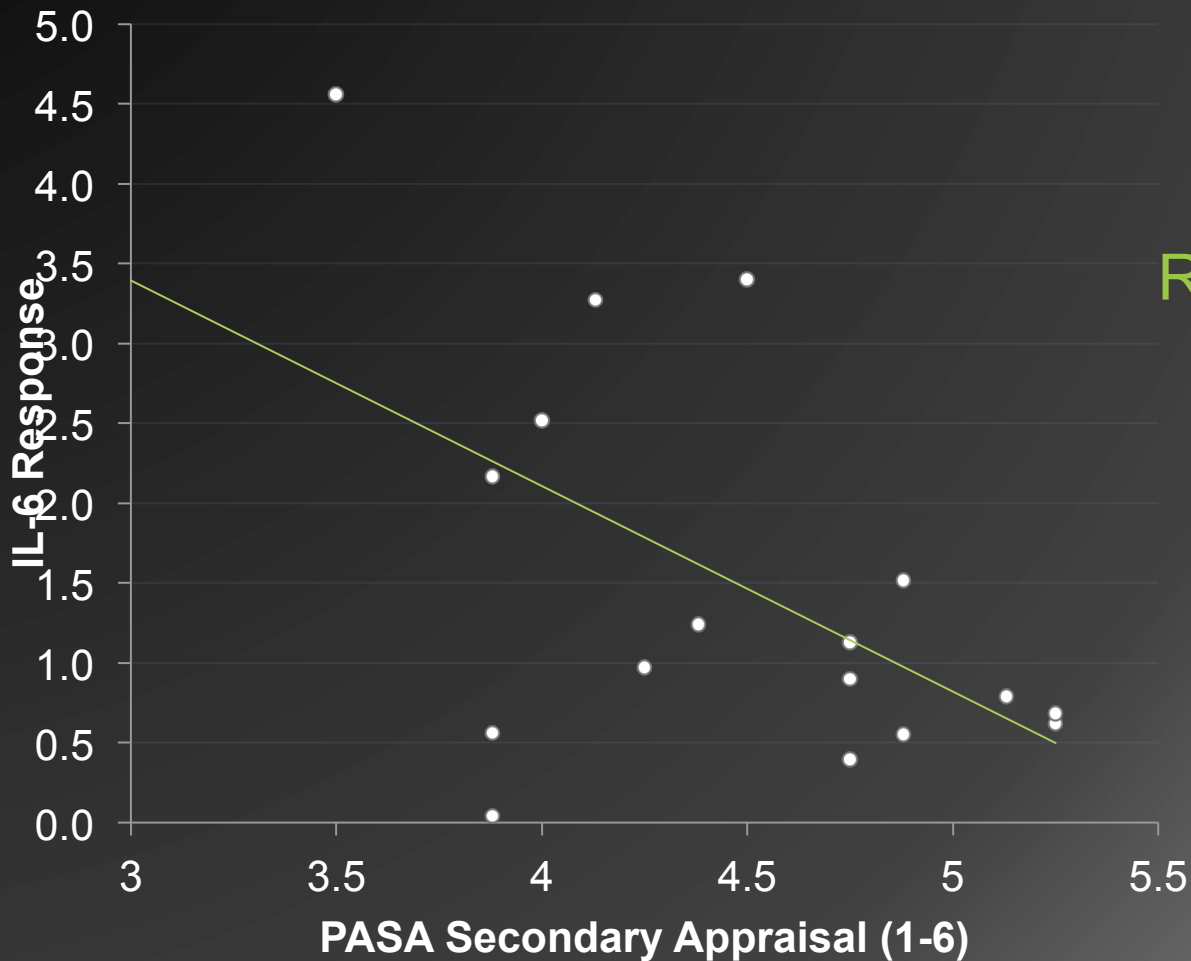
Is anticipatory threat related to the stress-induced il-6 response?
Does threat mediate the relationship between SSS and IL-6?



The significant relationship between community SSS and the delta IL6 response ($\beta = -.4350$, $SE = .1884$, $p = .0346$) on day 2 remained significant after controlling for the mediator threat on day 2 ($\beta = -.4168$, $SE = .1956$, $p = .05$).

Mediation Path II

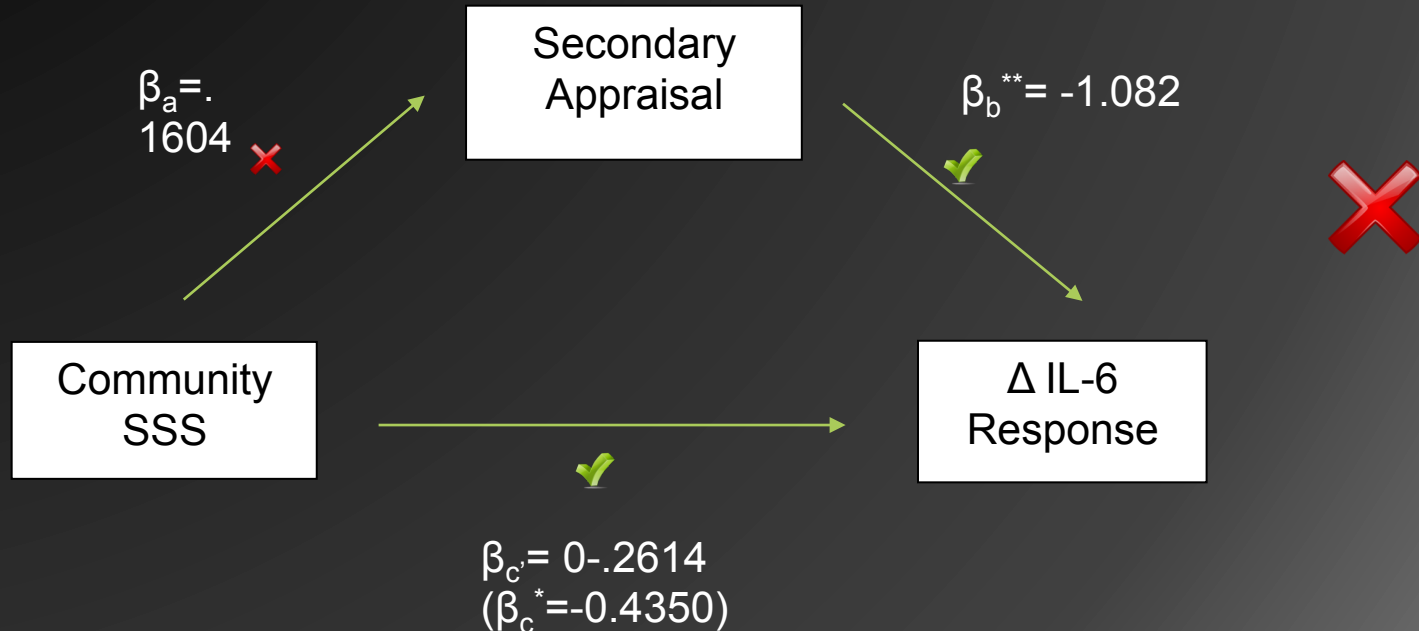
Is secondary appraisal related to the stress-induced il-6 response?



$R = -.67, p = .002$



Mediation Path II

Mediation Analysis: SSS, Secondary Appraisal, and Δ IL-6

Model Summary for DV Model: $R^2 = .528$; $F(2, 15) = 8.38$; $p = .0036$; $N = 18$

Summary

Lower SSS predicts higher stress-induced plasma IL-6

- Subjective Social Status strongly correlated with the magnitude of the IL-6 response
- **Not mediated** by primary or secondary appraisal
- Secondary appraisal predicts IL-6 response
- All results found upon **repeated** stress, but not initial stress.
- Limitations:
 - Limited sample characteristics
 - Results may not be generalizable
 - No low SES participants

Conclusions

- Subjective Social Status is an important indicator of health and should be considered along with SES in studies looking at the relationship between status and health
- SSS may be particularly important for younger adults
- Low SSS persons at higher risk of elevated plasma IL-6 and the potential consequences thereof

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