Validation of the TTM Decisional Balance and Self-Efficacy Measures for Exercise in an Adult African American Sample

Cerissa Blaney, Mark L. Robbins, Andrea L. Paiva, Colleen Redding, Joseph S. Rossi, Bryan Blissmer, Caitlin Burditt, Karin Oatley
Introduction

- Exercise is crucial for prevention of chronic disease
- Physical Inactivity remains a public health problem
- African Americans reports higher rates of chronic disease & physical inactivity compared to Whites
- Need for effective exercise interventions particularly for African Americans
Introduction

• Effective interventions require valid measures

• TTM measures for exercise
  • Developed and validated in primarily white populations

• Not validated specifically for African Americans (Marcus et al 1992; Noar, 2003; Prochaska & Velicer, 1997)
Aims of the Study

- Validation of the TTM Decisional Balance and Self-Efficacy exercise measures in an African American sample
  - Stage of Change
  - Decisional Balance
  - Self-Efficacy
Hypotheses

- $H_1$: Decisional Balance model prediction: two-factor uncorrelated model
- $H_2$: Increase in Pros and a decrease in Cons across the Stages of Change
- $H_3$: Self-Efficacy model prediction: on-factor model
- $H_4$: Increase in Self-Efficacy across the Stages of Change
- $H_5$: Increase in self reported exercise across the Stages of Change
Sample Characteristics

521 African American adults

- **Demographics**
  - Mean age 37 years (range 18 to 70)
  - 79% female
  - 37% married or living with a partner
  - Mean BMI of 29.1 (SD = 7.1)
Method

- Confirmatory Factor Analysis EQS
  - Macro fit indices: $\chi^2$, CFI, GFI, AASR RMSEA
  - Micro fit indices: factor loadings

- External Validation by the Stage of Change
  - MANOVA and ANOVA
  - Follow up tests and effect size
Measures

- **Stage of Change:**
  - A staging algorithm representing the five stages of change
- **Decisional Balance:**
  - 10-item measure: 5 Pros ($\alpha=.90$); 5 Cons ($\alpha=.67$)
- **Self-Efficacy:**
  - 6-item measure: ($\alpha=.82$)
- **Godin Leisure Time Exercise Questionnaire (QLTQ):**
  - 3 Item measure: (two week test-retest reliability ranged $\alpha=.80-.94$)
Decisional Balance: Confirmatory Model

**Decisional Balance Uncorrelated Model (N=511)**

**PROS** (a=.847)
1. I would have more energy for my family and friends if I exercised regularly.
2. I would feel less stressed if I exercised regularly.
3. Exercising puts me in a better mood for the rest of the day.
4. I would feel more comfortable with my body.
5. Regular exercise would help me have a more positive outlook on life.

**CONS** (a=.737)
1. I would feel embarrassed if people saw me exercising.
2. Exercise prevents me from spending time with my friends.
3. I feel uncomfortable or embarrassed in exercise clothes.
4. There is too much I would have to learn to exercise.
5. Exercise puts an extra burden on my significant other.

**Indices:**
- AASR = .044
- CFI = .922
- GFI = .937
- RMSEA = .083
- X^2 = 158.761* (dF=35)
Self-Efficacy: Confirmatory Model

1. I am under a lot of stress.
2. I feel I don’t have time.
3. I have to exercise alone.
4. I don’t have access to exercise equipment.
5. I am spending time with friends or family who do not exercise.
6. If the weather is bad (such as when it’s raining or too hot).

AASR = .029
CFI = .955
GFI = .971
RMSEA = .087
X2 = 43.51* (dF=9)
N=508
MANOVA: Pros and Cons by Stage

MANOVA: F(8,1006) = 6.08, p < .05, η² = .05;
ANOVA (Pros): F(4, 504) = 12.13, p < .001, η² = .09;
Tukey follow-up test: PC < PR, A, M; C < PR, M
ANOVA: Self-Efficacy by Stage

F(4, 501) = 11.03, p<.001, η²=.08
Tukey follow-up test: M > all stages
ANOVA: GLTEQ by Stage

Exercise bouts per week

- PC (N=32)
- C (N=43)
- PR (N=199)
- A (N=70)
- M (N=169)

Stage of Change

F(4, 502) = 37.99, p<.001, η²=.23;
Tukey follow-up test: PC < M
Discussion

• Results comparable to previous research
• Replication - validated TTM exercise measures DCBL and SE in AA sample
• Cons did not differ by stage of change
  – Needs further investigation
• Gender Differences
  – Need a larger sample of African American
Limitations

- Cross-Sectional Design
- Stage distribution
  - Not recruited for exercise stage
- Predominantly Female
- Measure Development
Future Directions

• Longitudinal Analyses
• Invariance Testing (similar to Paxton et al., 2008)
  – Gender
  – Age
  – Ethnicity
  – Various SES groups
  – Region of the country
Questions
Staging

• **Precontemplation**
  – Not thinking about exercising regularly in the next 6 months

• **Contemplation**
  – Intend to engage in regular exercise in the next 6 months

• **Preparation**
  – Intend to engage in regular exercise in the next 30 days

• **Action**
  – Have been exercising regularly for less than six months

• **Maintenance**
  – Have you been exercising regularly for the past six months or more
Decisional Balance: Items and Descriptives

**PROS**
- I would have more energy for my family and friends if I exercised regularly, M= 3.93 (1.1)
- would feel less stressed if I exercised regularly, M= 4.12 (1.0)
- Exercising puts me in a better mood for the rest of the day, M= 3.98 (1.1)
- I would feel more comfortable with my body, M= 4.20 (1.0)
- Regular exercise would help me have a more positive outlook on life. 4.01 (1.1)

**CONS**
- I would feel embarrassed if people saw me exercising, M= 1.44 (1.0)
- Exercise prevents me from spending time with my friends, M=1.42 (.83)
- I feel uncomfortable or embarrassed in exercise clothes, M= 1.38 (.89)
- There is too much I would have to learn to exercise. M=1.24 (.69)
- Exercise puts an extra burden on my significant other, M= 1.23 (.68)
Self-Efficacy: Items and Descriptives

- I am under a lot of stress, $M = 3.38$ (1.3)
- I feel I don’t have the time, $M = 2.68$ (1.3)
- I have to exercise alone, $M = 3.02$ (1.5)
- I don’t have access to exercise equipment, $M = 2.77$ (1.4)
- I am spending time with friends or family who do not exercise, $M = 2.84$ (1.4)
- If the weather is bad (such as when it’s raining or too hot), $M = 2.73$ (1.4)
## Decisional Balance: Alternative Model Testing

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>DF</th>
<th>$\chi^2$/DF ratio</th>
<th>AIC</th>
<th>RMSEA</th>
<th>GFI</th>
<th>AASR</th>
<th>CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1: Null Model</td>
<td>1637.05*</td>
<td>45</td>
<td>36.38</td>
<td>1547.05</td>
<td>.08</td>
<td>.94</td>
<td>.044</td>
<td>.92</td>
</tr>
<tr>
<td>Model 2: Uncorrelated Two Factor Model</td>
<td>158.76*</td>
<td>35</td>
<td>4.54</td>
<td>88.76</td>
<td>.08</td>
<td>.94</td>
<td>.039</td>
<td>.92</td>
</tr>
<tr>
<td>Model 3: Correlated Two Factor Model</td>
<td>156.94*</td>
<td>34</td>
<td>4.62</td>
<td>88.94</td>
<td>.08</td>
<td>.94</td>
<td>.039</td>
<td>.92</td>
</tr>
<tr>
<td>Model 4: One Factor DCBL Model</td>
<td>626.12*</td>
<td>35</td>
<td>17.89</td>
<td>556.12</td>
<td>.18</td>
<td>.76</td>
<td>.09</td>
<td>.63</td>
</tr>
</tbody>
</table>
## Self-Efficacy: Alternative Model Testing

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>DF</th>
<th>$\chi^2$/DF ratio</th>
<th>AIC</th>
<th>RMSEA</th>
<th>CFI</th>
<th>GFI</th>
<th>AASR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1: Null Model</td>
<td>786.154*</td>
<td>15</td>
<td>52.41</td>
<td>756.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 2: One Factor Model</td>
<td>45.513*</td>
<td>9</td>
<td>5.06</td>
<td>25.51</td>
<td>.09</td>
<td>.96</td>
<td>.97</td>
<td>.03</td>
</tr>
</tbody>
</table>