The Role of Distress Tolerance in terms of Anxiety Sensitivity among Young Adults with Asthma

Talya Alsaid-Habia, B.A.¹, Alison C. McLeish, Ph.D.¹, Christina M. Luberto, Ph.D.¹,², & Emily M. O’Bryan, M.A.¹

¹ University of Cincinnati
² Massachusetts General Hospital/Harvard Medical School
Asthma: Prevalence & Impact

- Prevalence = 1 in 12 adults
- 85% report symptoms of poor asthma control
- Impact on healthcare system:
  - 8.9 million doctor’s visits
  - ¼ of all ED visits
  - 14.2 million lost work days
  - $56 billion in annual health care costs

American Lung Association, 2012; CDC, 2015; Marcus et al., 2008
Asthma & Panic Psychopathology

- Rates of PA and PD in asthma 4.5x higher
- Adverse effects on asthma despite no differences in lung function
  - Poorer control
  - Increased functional impairment
  - Increased bronchodilator use
  - Greater HCU

Lavoie et al., 2005; Feldman et al., 2005; Feldman et al., 2009; Goodwin et al., 2003; Hasler et al., 2005; Lavoie et al., 2005; Ritz et al., 2008; Schneider et al., 2008; Weiser, 2007; Boudreau et al., 2015
Asthma & Anxiety Sensitivity (AS)

- **AS** = fear of arousal-related physical and psychological sensations
  - May be mechanism underlying panic-asthma association
- **AS** associated with
  - Anxiety in response to asthma symptoms
  - Poorer control
  - Increased asthma-related functional impairment
  - Increased nocturnal waking
  - Greater bronchodilator use
- **Physical concerns domain**

Avallone et al., 2012; Carr et al, 1995; McCauley et al., 2007; McLeish et al., 2011; McNally, 2002; Reiss & McNally, 1985; McLeish et al., 2016; Favreau et al., 2014
Distress Tolerance (DT)

• Ability to tolerate or withstand negative or aversive emotional states

• Evaluations of and expectations about emotions in terms of:
  • Level of aversiveness and tolerability
  • Acceptability
  • Need for emotion regulation strategies intended to avoid or reduce it
  • Absorption of attentional resources and disruption of behavior

Simon & Gaher, 2005
Distress Tolerance (DT)

- Transdiagnostic risk factor:
  - Depressive symptoms
  - Bulimic symptoms
  - Substance Use
  - Self-harm
  - Risky sexual behavior
  - Anxiety psychopathology

Zvolensky & Hogan, 2013; Zvolensky et al., 2010; Williams et al, 2013; Ellis, 2010; Anestis et al., 2007; Zvolensky et al., 2009; Anestis et al., 2013
Distress Tolerance and Anxiety Sensitivity

- Inverse relationship
  - High in AS → Low in DT
- AS and DT are lower-order facets of the same higher-order factor
- Related but unique constructs

Anestis et al., 2007; Bernstein et al., 2009
Theoretical Model

Asthma-related Physical Sensations

Anxiety & Distress

Amplified Reactions (AS)

Low tolerance to negative emotions (DT)

↑ Anxiety and distress

↑ Asthma symptoms & risk for attack
Current Study

Specific Aim
• Examine unique predictive ability of DT in terms of global AS and AS- Physical, Cognitive, and Social Concerns among young adults with asthma

Hypothesis
• After controlling for the effects of gender, negative affect and asthma control, DT will significantly predict AS
Method - Participants

- 101 undergraduates with asthma
  - 76.2% female
  - 75.2% Caucasian
  - $M_{age} = 19.69$ years
    - (SD = 3.77; Range = 18-49)
  - $M_{age}$ at asthma diagnosis = 9.86 years
    - (SD = 5.95)
  - 46.5% hospitalized
  - 9.7% intubated
Method: Measures

**Covariates**
- Demographic information (gender)
- Positive Affect Negative Affect Schedule - Negative Affect subscale (PANAS-NA)
- Asthma Control Test (ACT - Total)

**Predictor Variable**
- Distress Tolerance Scale (DTS)

**Criterion Variables**
- Anxiety Sensitivity Index-3
  - Total score (AS-Total)
  - Physical Concerns subscale (AS-Physical)
  - Cognitive Concerns subscale (AS-Cognitive)
  - Social Concerns subscale (AS-Social)

Simons & Gafer, 2005; Taylor et al., 2007; Watson et al., 1988; Nathan et al., 2004
Method: Procedure

• Eligibility
  - Age 18-65
  - Asthma diagnosis
    • Self-reported physician diagnosis of asthma
    • Evidence of current prescription for asthma medication
    • Symptoms within past year
    • Non-smoker

• Completed self-report measures
• Compensated with course credit
Results: Zero-Order Correlations

- DT was significantly negatively correlated with global AS and all three subscales
- Ranged from $r = -0.24$ to $r = -0.37$
## Results: AS-Total

<table>
<thead>
<tr>
<th></th>
<th>$\Delta R^2$</th>
<th>$t$</th>
<th>$\beta$</th>
<th>$sr^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criterion Variable: Global Anxiety Sensitivity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td>.34</td>
<td></td>
<td></td>
<td>.00**</td>
<td>.00**</td>
</tr>
<tr>
<td>Gender</td>
<td>-.27</td>
<td>-.02</td>
<td>.00</td>
<td>.79</td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>-.29</td>
<td>-.03</td>
<td>.00</td>
<td>.77</td>
<td></td>
</tr>
<tr>
<td>Asthma Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td>6.79</td>
<td>.59</td>
<td>.33</td>
<td>.00**</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>.03</td>
<td></td>
<td></td>
<td>.05*</td>
<td></td>
</tr>
<tr>
<td>DTS</td>
<td>-2.01</td>
<td>-.18</td>
<td>.03</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* $p < .05$, ** $p < .01$
## Results: AS-Physical Concerns

<table>
<thead>
<tr>
<th></th>
<th>$\Delta R^2$</th>
<th>$t$</th>
<th>$\beta$</th>
<th>$sr^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criterion Variable: Anxiety Sensitivity - Physical Concerns</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td>.21</td>
<td></td>
<td></td>
<td></td>
<td>.00**</td>
</tr>
<tr>
<td>Gender</td>
<td>1.69</td>
<td>.16</td>
<td>.02</td>
<td>.09</td>
<td></td>
</tr>
<tr>
<td>Asthma Control</td>
<td>-1.32</td>
<td>-.12</td>
<td>.01</td>
<td>.19</td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td>4.01</td>
<td>.38</td>
<td>.14</td>
<td>.00**</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>.00</td>
<td></td>
<td></td>
<td></td>
<td>.65</td>
</tr>
<tr>
<td>DTS</td>
<td>-2.22</td>
<td>-.05</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Results: AS-Cognitive Concerns

<table>
<thead>
<tr>
<th></th>
<th>$\Delta R^2$</th>
<th>$t$</th>
<th>$B$</th>
<th>$sr^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criterion Variable: Anxiety Sensitivity - Cognitive Concerns</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td>.21</td>
<td></td>
<td></td>
<td></td>
<td>.00**</td>
</tr>
<tr>
<td>Gender</td>
<td>- .47</td>
<td>- .05</td>
<td>.00</td>
<td>.64</td>
<td></td>
</tr>
<tr>
<td>Asthma Control</td>
<td>.04</td>
<td>.00</td>
<td>.00</td>
<td>.96</td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td>4.94</td>
<td>.46</td>
<td>.21</td>
<td>.00**</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>.04</td>
<td></td>
<td></td>
<td></td>
<td>.04*</td>
</tr>
<tr>
<td>DTS</td>
<td>-2.10</td>
<td>-.21</td>
<td>.04</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* $p < .05$, ** $p < .01$
## Results: AS-Social Concerns

<table>
<thead>
<tr>
<th>Step</th>
<th>$\Delta R^2$</th>
<th>$t$</th>
<th>$\beta$</th>
<th>sr²</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criterion Variable: Anxiety Sensitivity - Social Concerns</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td>.32</td>
<td></td>
<td></td>
<td></td>
<td>.00**</td>
</tr>
<tr>
<td>Gender</td>
<td>-1.62</td>
<td>-.14</td>
<td>.02</td>
<td></td>
<td>.11</td>
</tr>
<tr>
<td>Asthma Control</td>
<td>.28</td>
<td>.02</td>
<td>.00</td>
<td></td>
<td>.78</td>
</tr>
<tr>
<td>NA</td>
<td>6.59</td>
<td>.58</td>
<td>.31</td>
<td></td>
<td>.00**</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>.04</td>
<td></td>
<td></td>
<td></td>
<td>.03*</td>
</tr>
<tr>
<td>DTS</td>
<td>-2.25</td>
<td>-.21</td>
<td>.04</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* $p < .05$, ** $p < .01$
Conclusions

- Low DT associated with greater
  - Global AS (2.8% unique variance)
  - AS-Cognitive Concerns (3.6% unique variance)
  - AS-Social Concerns (3.5% unique variance)
- Not associated with AS-Physical Concerns
  - Individuals with asthma are used to physical symptoms of anxiety, which resemble asthma exacerbations
  - DT is the ability to withstand negative emotional states
- May result in greater difficulties with asthma management
- Interventions to increase DT
Next Steps

- Use a more diverse sample
- Biological verification of asthma
- Longitudinal study
- Examine the role of distress tolerance on asthma control and asthma quality of life
Acknowledgements

Funding by University of Cincinnati - University Research Council