Findings from the NIU Trauma Study

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Acknowledgments

- The participants
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- Consultants: Ron Kessler, Dan & Lynda King, Joel Milner, Candace Monson, Fran Norris, Meena Vythilingham & Kerry Ressler
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Goals for presentation

- Background and overview of NIU Trauma Study
- Discuss my new trajectory analyses (FAIL!)

Background

- Northern Illinois University Mass Shooting
  - Occurred on February 14, 2008
  - Lone gunman opened fire in large lecture hall (150-200 people) and then killed himself before police arrived.
  - 6 individuals were killed (including gunman) and an additional 18 wounded.
  - 4th deadliest university shooting in U.S. history
Overview Of NIU Trauma Study

- At the time of the mass shooting at Northern Illinois University (NIU) on February 14, 2008, I had an ongoing federally funded longitudinal study of sexual revictimization (funding period: April 2006 to April 2009).

Overview Of Mass Shooting Research Program

- Participants who completed the first assessment session (T1; \( N = 1,045 \)) were Introductory Psychology students recruited from a mass testing pool.
  - Had to be female, over the 18 and fluent in English (not selected on victimization history)
  - Collected in person at CSFVSA, computer administered and took approximately one hour to complete.
  - Data for T1 were collected between September 2006 and prior to the mass shooting on February 14, 2008.

Overview Of Mass Shooting Research Program

- On 2/14/08 began trying to find funding for NIU Trauma Study.
- Secured sufficient funding to launch online survey 17 days after the mass shooting (known as NIU Trauma Study).

Overview Of Mass Shooting Research Program

- Of the 1,045 female participants interviewed at T1,
  - 885 (85%) had consented to be contacted and invited to participate in follow-up research
  - Of the 885, 812 (78% of 1,045) were considered eligible for the post-shooting assessment (current NIU students at the time of the shooting)
  - Invited via e-mail to complete a follow-up battery of measures on-line (approx 30 min).
  - Of those invited to participate, 691 (85%) completed the post-shooting assessment (T2)
NIU Trauma Study

- NIU Trauma Study
  - Was funded through Spring 2010 through NIMH - now on no-cost extension
  - Spring 2008 (Time 2), N = 691
  - Fall 2008 (Time 3), N = 588, 85%
  - Spring 2009 (Time 4), N = 591, 86%
  - Fall 2009 (Time 5), N = 586, 85%
  - Spring 2010 (Time 6), N = 578, 84%
  - Fall 2010 (Time 7), N = 246 (6 days in)

Expressive Writing Study

- 58 participants identified as high or low physical exposure to the mass shooting were brought into lab (exception - participants in Cole hall classroom were excluded) (conducted between 3/08 and 5/08.
- Each participant is tested individually in a small, sound-attenuated room equipped with electrodes for measuring HR, SCLs, and EMG ratings

Writing prompt (modified from Pennebaker protocols): For the next 20 minutes, write about your deepest thoughts and feelings regarding the mass shooting at Northern Illinois University on February 14, 2008. . . .
- Read writing aloud
- Physiological measures, saliva, questionnaire based measures

Clinical reappraisal

- 154 women participated in a clinical reappraisal substudy during which they were administered targeted sections of a structured diagnostic interview. (Spring 2009)
- Of the 154 women in the clinical reappraisal substudy, 118 (77%) completed an at-home saliva collection involving five collections in a single day (wake, 30 minutes post wake, noon, 3 p.m., and 9 p.m.).
NIU Trauma Study

- Genetics
  - Ressler at Emory
  - 276 samples
  - Time 7 (target is 100 additional)

Background

- Traumatic experiences can often have negative psychological consequences
- Depression, anxiety. Posttraumatic Stress Disorder (PTSD)
- What is PTSD?
  - A. Exposure to traumatic stressor with response of fear, helplessness, or horror.
  - B. One Reexperiencing symptom
  - C. Three Avoidance and numbing symptoms
  - D. Two Hyperarousal symptoms
  - E. Duration greater than one month
  - F. Symptoms cause distress or impairment in functioning

Risk Factors for PTSD?

- Ozer et al. included seven factors in their meta analytic review based on support from the extant literature:
  - "(a) history of at least one other trauma prior to the index traumatic event,
  - (b) psychological adjustment prior to the traumatic event,
  - (c) family history of psychopathology,
  - (d) perceived life threat during the traumatic event,
  - (e) perceived social support following the traumatic event,
  - (f) peritraumatic emotionality - high levels of emotion during or in the intermediate aftermath of the traumatic event, and
  - (g) peritraumatic dissociation – dissociative experiences during or in the intermediate aftermath of the traumatic event." (p. 55).
Risk Factors for PTSD?

- (a) history of at least one other trauma prior to the index traumatic event,
- (b) psychological adjustment prior to the traumatic event,
- (f) peritraumatic emotionality – high levels of emotion during or in the intermediate aftermath of the traumatic event
- (g) peritraumatic dissociation – dissociative experiences during or in the intermediate aftermath of the traumatic event

Pre-trauma Risk factors

- Historical or static factors
  - Gender
  - History of Trauma Exposure
  - Race/Ethnicity
  - Age

Peritraumatic Risk Factors

- Level of exposure (physical)
- Peritraumatic Emotional Response
  - fear, helplessness, horror
- Peritraumatic Dissociation
  - experience in which a person's normal awareness, memory, identity, or perception of the environment is temporarily disrupted during a traumatic experience

Methodological Considerations

- Longitudinal designs are necessary for examining pre-trauma risk factors
  - Rare
  - Methodologically difficult
- Peritraumatic factors difficult to assess
  - Interval between trauma and assessment important
**Purpose of the NIU Trauma Study**

- To examine post-trauma adjustment outcomes as well as risk and protective factors for adjustment problems following the mass shooting at NIU.

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**Experiential Avoidance**

- Experiential avoidance (EA)
  - unwillingness to remain in contact with negative thoughts, feelings, memories
  - steps taken to alter the form or experience of these events
- Peritraumatic Dissociation (PD)
  - experience in which a person's normal awareness, memory, identity, or perception of the environment is temporarily disrupted during or in the intermediate aftermath of a traumatic experience.

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**Experiential Avoidance**

- Peritraumatic Dissociation may be a form of Experiential Avoidance
  - (Hayes et al., 1996; Polusny & Follette, 1995)
- Pursuing several research questions related to the relations between experiential avoidance, peritraumatic dissociation, trauma exposure and PTSD.

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**Hypotheses**

- Predicting level of PTSD symptoms shortly after the mass shooting (technically not PTSD)
  - PTSD symptoms reported before the mass shooting will predict PTSD symptoms reported after the mass shooting (Time 2)
  - Women reporting higher levels of exposure to the mass shooting will report higher levels of PTSD symptoms at Time 2.
  - Women reporting higher levels of experiential avoidance at Time 1 will report higher levels of PTSD symptoms at Time 2.
Hypotheses

- Women reporting higher levels of experiential avoidance at Time 1 and higher levels of exposure and higher levels of PTSD symptoms at Time 1 will report the highest levels of PTSD symptoms at Time 2.

Method - Procedure

- Longitudinal study of college females
- Pre-shooting assessment part of prospective study of sexual revictimization
  - Data collected between September 2006 and February 14th, 2008
- Post-shooting assessment
  - launched March 2nd, 2008 (17 days after mass shooting)
  - Data collected online using SSIWeb software

Method - Participants

- Average age 19.4 years
- Race - 67.9% White, 20.1% Black, 3% Asian
- Ethnicity
  - 6.9% Hispanic
- Race/ethnicity was included in the model as covariate

Method - Participants

- Interval between Time 1 & Time 2
  - Ranged from 2 to 82 weeks
  - Mean 30.88 (21.7)
- Interval between mass shooting and Time 2
  - Ranged from 17 to 100 days
  - Mean 29.5 days (16)
  - 80% were completed by 40 days
Method - Measures

PTSD symptoms
- Kubany's Distressing Events Questionnaire.
- Assesses 17 PTSD symptoms along three clusters (avoidance, reexperiencing, hyperarousal)
- Rated on a 5-point scale
  - Time 1 – most distressing traumatic event
  - Time 2 – 7 - mass shooting and most distressing event
- Probable PTSD was calculated
- Count of symptoms was calculated (moderate or above)

Peritraumatic Dissociation Experiences Questionnaire (PDEQ)
- 8 items specific to reactions during the shooting
  - ex: My sense of time changed - things seemed to be happening in slow motion; I “blanked out” or “spaced out” or in some way felt that I was not part of what was going on; What was happening seemed unreal to me, like I was in a dream or watching a movie or a play.
- Rated on a 4-point scale
- Total score was calculated by averaging across the 8 items

Peritraumatic emotional response
- 3 items assessing experience of intense fear, helplessness or horror related to the shooting.
- Dichotomous variable created with 1 indicating any endorsement of fear, helplessness, or horror and 0 indicated no endorsement.

Physical exposure to the mass shooting
- 2 methods of assessment: open-ended and yes/no response options
- Open-ended data were coded into physical exposure tiers, ranging from off campus at the time of the shooting to in the classroom where the shooting occurred.
- Ordinal variable was created - low, moderate, and high exposure
Physical Exposure

- 76.4% ($n = 524$) on campus when the shootings occurred
- 68.8% ($n = 474$) saw police or other personnel surrounding buildings
- 6.4% ($n = 44$) heard the sound of gunfire
- 3.5% ($n = 24$) were in Cole Hall

- 22% ($n = 152$) saw individuals who were wounded or killed.
- 23% ($n = 159$) knew someone who was killed in the shooting.
- 34.3% ($n = 235$) knew someone who was wounded in the shooting.
- 2.2% ($n = 15$) saw the gunman.

Physical Exposure

- 1.6% ($n = 11$) saw the gunman fire upon someone.
- 0.4% ($n = 3$) were fired upon by the gunman.
- 0.4% ($n = 3$) were hurt in the shooting.
- 48.6% ($n = 334$) were in a building that was placed on lockdown.

<table>
<thead>
<tr>
<th>Number endorsed</th>
<th>N (%)</th>
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<tbody>
<tr>
<td>0</td>
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</tr>
<tr>
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<td>98 (14%)</td>
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<td>230 (33%)</td>
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</tr>
<tr>
<td>7</td>
<td>1 (0.1%)</td>
</tr>
<tr>
<td>8</td>
<td>5 (0.7%)</td>
</tr>
<tr>
<td>9</td>
<td>3 (0.4%)</td>
</tr>
<tr>
<td>10</td>
<td>1 (0.1%)</td>
</tr>
</tbody>
</table>
Results - PTSD symptoms

- Using a cutoff of 18 on the PTSD measure (count in parens):
  - At Time 1, 19.3% of females had total sum scores that were 18 and above (2.72).
  - At Time 2, 49.5% / 48.7% / 6.06
  - At Time 3, 14.5% / 11.6% / 1.90
  - At Time 4, 13% / 7.9% / 1.56
  - At Time 5, 9.3% / 5.4% / 1.18
  - At Time 6, 9.4%, 4.5% / .99

Results

Logistic regression
- DV = probable PTSD at Time 2
  - Step 1: Race/ethnicity & interval, NS
  - Step 2: T1 probable PTSD - OR = 3.76***
  - Step 3: T1 Experiential Avoidance - OR = 1.46***
  - Step 4: Shooting Exposure - OR = 1.46***
  - Step 5: EA X Expose, NS
    - Expose X T1 PTSD, NS
    - EA X T1 PTSD - OR = .47**
  - Step 6: EA X T1 PTSD X Expose - OR = .66**

Logistic regression
- DV = probable PTSD at Time 3
  - Step 1: Race/ethnicity & interval, NS
  - Step 2: T1 probable PTSD - OR = 4.87***
  - Step 3: T1 Experiential Avoidance - OR = 1.84***
  - Step 4: Shooting Exposure - OR = 1.39***
  - Step 5: EA X Expose, NS
    - Expose X T1 PTSD, NS
    - EA X T1 PTSD - OR = .39**
  - Step 6: EA X T1 PTSD X Expose - NS
- Also ran including Time 2 PTSD as predictor
Discussion

Limitations

- Strengths
  - Longitudinal design
  - Immediacy of post-trauma assessment (17 - 58 days)
  - Shared event
- Limitations
  - Female only sample
  - Differential levels of exposure
  - Immediacy of post-trauma assessment (acute vs. chronic symptoms)

Future Directions