Modeling Longitudinal Cumulative Ecological Risk for Child Maltreatment: Opportunities and Challenges

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Dissertation:

*Neighborhood and cumulative ecological risk: Predicting physical abuse and neglect in an urban longitudinal studies of child abuse and neglect (LONGSCAN) sample*

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*To be submitted to the Faculty of the Graduate School of the University of Maryland, Baltimore in partial fulfillment of the requirements for the degree of Doctor of Philosophy.*
Presentation Overview

- Dissertation Study
  - Objectives
  - Theory
  - Literature
- Question One: Risk Thresholds
- Question Two: Parceling Risk
- Question Three: Operational Definition of Child Maltreatment
Study Objectives

1. To explore the associations between neighborhood structural characteristics and parent perceptions of neighborhood processes as predictors of child physical abuse and neglect.

2. To develop a longitudinal cumulative ecological-transactional risk model to predict child physical abuse and neglect.
Neighborhood and Ecological Studies of Child Maltreatment

- **Meta-analyses:**
  - Freisthler, Merritt, and LaScala (2006)
    - 16 of 18 studies reviewed were aggregate level
  - Coulton, Crampton, Irwin, Spilsbury and Korbin (2007)
    - 19 of 25 studies reviewed were aggregate level

- Since 2007, additional multilevel studies explore neighborhood structure and/or process.
  - Social Disorganization Theory- Social Distress Scale (Coulton, Korbin, and Su, 1996)
  - Economic Indicators (e.g. GINI coefficient, foreclosures)
  - Alcohol outlets and drinking behaviors (e.g. Freisthler and others)
  - Process (e.g. social support, collective efficacy)
Cumulative Risk to Predict Child Maltreatment

- Child maltreatment is often most included in cumulative risk models as a predictor of other outcomes.
- Cumulative risk methods have been used to predict child maltreatment related outcomes.
- Selection of variables and risk thresholds were often based on convenience and not theoretically grounded.
- Neighborhood markers were rarely represented.
  - Only three studies included any neighborhood predictors.
Methodological Advantages of a Cumulative Risk Index (CRI)

- Simplicity in calculation
- Minimal statistical power required
- Not subject to colinearity
- Lends to parsimony
- Professionals and policy makers without methodological training can easily understand the methodology of a CRI, which broadens practical applications.

(Evans, Li, Whipple, 2013).
Theoretical Background

- Ecological Transactional Framework* (Cicchetti & Lynch, 1993)
- Cumulative Risk Theory* (Rutter, 1979)
  - Toxic Stress (Shonkoff & Garner, 2012)
  - Allostatic Load (McEwan & Stellar, 1993)
- Social Disorganization Theory (Shaw & McKay, 1942)

* Focus of this presentation
Cumulative Ecological-Transactional Model of Risk
Baltimore LONGSCAN Sample

Three groups recruited from pediatric clinics:

1. Infants and toddlers who were diagnosed with Failure to Thrive (FTT);
2. Infants at risk for HIV, primarily through maternal substance abuse prenatally;
3. Control group of pediatric patients.

- Born between 1988 and 1991
- Urban neighborhoods near pediatric clinics in West Baltimore.
- 93% of the 322 children recruited identified as African American.
Panoramic view of Baltimore along the Inner and Outer Harbor at dusk
Emily Painter, 7, plays in front of vacant rowhouses next to her home on Baltimore’s West Side. (Amanda Voisard/For The Washington Post)
Procedure

- Participant addresses *at age six* will be extracted from Baltimore LONGSCAN original paper files to ID keyed database.
- Addresses will be geocoded using 1990 census data.
- Geocodes will be connected with LONGSCAN longitudinal data from age 6 to 18.
- IRB protocol #HP-00041429 (PI: Dubowitz)
Potentiating

Compensatory

Ontogenic

Child

Micro-system

Caregiver & Family

Exo system

Neighborhood Process and Structure

Macro-system

Neighborhood Risk Assessment

- Attachment
- Child-friendliness
- Tangible Support
- Safety

Social Disorganization:

- Impoverishment
- Instability
- Child care burden

History of loss or victimization

Employment

Health

Education

Social support

Depression

Single parent

Domestic violence

Birthweight

Prematurity

Health Status

Tangible Support

Safety

Child-friendliness

Impoverishment

Instability

Child care burden

Transient

Enduring
Question One: Risk Thresholds

➢ Ideal Strategies
  o Not sample dependent
  o Theoretically justified
  o Generalizable

➢ Approaches in the literature
  o Percentile rank (e.g. 75\textsuperscript{th}, 85\textsuperscript{th})
  o Normalized data
## Ontogenic and Microsystem Level Risk

### Ontogenic
- Low Birthweight
- Prematurity
- Child Health Status

### Risk Marker
- (<2500g)
- (<37 weeks)
- (poor or fair rating)

### Microsystem

#### Primary Care Giver
- Education (less than HS)
- Employment (not employed)
- Income (Public Assistance AFDC/TANF)
- Health Status (poor or fair rating)
- History of loss or victimization (affirmative)
- Social support (FSSQ <2 mean score)
- Mental health (CES-D >16)

#### Family
- Domestic violence (CTS, endorsed Physical Violence items)
- Marital Status (Not Partnered)
Exosystem Level Risk

- Neighborhood Processes
  - Attachment
  - Safety
  - Child-friendliness
  - Tangible Support

- Neighborhood Structure
  - Impoverishment
  - Instability
  - Child care burden

Neighborhood Risk Assessment (LONGSCAN, 1991)
Mean scale score <2
“Never true” or “Almost never true”

How to determine risk threshold?

<table>
<thead>
<tr>
<th>Variable</th>
<th>Operational Definition</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impoverishment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployment</td>
<td>% residents unemployed</td>
<td>.80</td>
</tr>
<tr>
<td>Family Headship</td>
<td>% female headed households</td>
<td>.83</td>
</tr>
<tr>
<td>Poverty</td>
<td>% poor persons</td>
<td>.80</td>
</tr>
<tr>
<td>Vacant housing</td>
<td>% vacant housing units</td>
<td>.53</td>
</tr>
<tr>
<td><strong>Child/Adult Ratio</strong></td>
<td># children (0-12)/ adults (21+)</td>
<td><strong>.77</strong></td>
</tr>
<tr>
<td>Instability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Movement 85-90</td>
<td></td>
<td>.90</td>
</tr>
<tr>
<td>Tenure</td>
<td>% current residence &lt;10 years</td>
<td>.92</td>
</tr>
<tr>
<td>Movement 89-90</td>
<td></td>
<td>.91</td>
</tr>
<tr>
<td>Child Care Burden</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elderly</td>
<td>% population over 65</td>
<td>-.50</td>
</tr>
<tr>
<td>Male/Female Ratio</td>
<td>adult male (21-64)/ Adult female (21-64)</td>
<td>-.90</td>
</tr>
<tr>
<td><strong>Black</strong></td>
<td>% Identifying as Black</td>
<td><strong>.67</strong></td>
</tr>
</tbody>
</table>

Explained 73.3% of the variance in child maltreatment rates
Mean = .3625
SD = .070
Census Tracts
N = 202
Baltimore Social Disorganization

Legend:
Mean Scale Score
- 0.075 - 0.293
- 0.293 - 0.343
- 0.343 - 0.393
- 0.393 - 0.446
- 0.446 - 0.519
Question Two: Parceling Risk

MacKenzie, Kotch & Lee (2011)
- Series of binary logistic regressions
  - Each marker entered separately with total number of other risks present

Hierarchic entry
- Will not account for cumulative risk effects

Other approaches?
Question Three: Operational Definition of Child Maltreatment

- CPS reports represent “tip of the iceberg” (Sedlak et al., 2010).

- LONGSCAN data includes three sources
  - CPS reports (MMCS; English, Graham, Litrownik, Everson, & Bangdiwala, 2005)
  - Parent reports
    - Conflict Tactics Scale (Straus, 1979)
  - Child reports
    - History of Physical Abuse (LONGSCAN, 1998)
Physical Abuse*

CPS Reports

No PA Allegations: 12.8% (n=36)

<1%: 1.1% (n=3)

Parent Reports

20.9%: 22.3% (n=63)

1.1%: 3.9% (n=11)

Child Reports

36.2%: 36.2% (n=102)

*ages 6 to 18

n=282


Coulton, Korbin, and Su, 1996


