EXPLORING SOCIAL CONTEXTS AT WORK:
Effects of family ties & workgroup size on teen construction worker safety

KIMBERLY J. RAUSCHER, MA, ScD,
ASSISTANT PROFESSOR, WEST VIRGINIA UNIVERSITY, USA
CO-AUTHORS: DOUGLAS J. MYERS, MA, ScD,
CAROL W. RUNYAN, MPH, PhD,
& MICHAEL D. SCHULMAN, PhD

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Our Purpose…

- To look at factors not typically considered in studies of young worker injury risk
- Injuries happen because work is dangerous
- Can the social context affect how dangerous work is?
Social Context of the Workplace

- Family ties - “family-firm connection”
  Works in a firm either owned by parents/family member or where their family member also works

- Workgroup size
  Number of co-workers who work on the job site
Why important for Safety?

Family Ties

- Social networks/connections important
- In construction, very important for:
  - *gaining access to jobs*
  - *assistance on the job*
- Family networks are especially important for youth
  - *finding employment*
- Are they important for safety once on the job?
Why important for Safety?

Family Ties

- Deferential treatment by supervisors & co-workers
  - not assigning dangerous tasks
  - giving more careful instruction
  - watching them more closely
- Family members may do so too
- Results in fewer exposures and better safety practices (e.g., training and supervision)

No empirical evidence to support this
Why important for Safety?

Workgroup Size

Smaller workgroups…

- Work in closer proximity to others = greater social contact
  - increased monitoring of tasks
  - assistance and instruction
  - encouragement to use safety practices (e.g., PPE)

- Results in fewer exposures and better safety practices
  (e.g., supervision, training)

No studies have looked at the effect of workgroup size on young worker safety
Research Question…

Are youth who have a family-firm connection, 
- or -
who work on job sites with small workgroups, 
exposed to fewer hazards 
and greater safety practices?
Methodology

Data Source

Study of youth working in construction, NC, USA
(\textit{Runyan, C, UNC IPRC})

- Cross-sectional data
- Telephone interviews
- 187 teens in North Carolina, USA
- Ages 14-17
- Work permit for construction
Methodology

Independent Variables

- **Family-firm connection**
  - Worked for firm owned by family member or, where family member also worked

- **Workgroup size**
  - # of co-workers usually present on the worksite
  - Dichotomized into
    - ≤10 workers / 11-50 workers
Methodology

Dependent Variables

- **Hazardous Exposures**
  - Using equipment and performing tasks - dangerous
    - 9 equipment items (forklift, nail gun, saws)
    - 7 task items (heavy lifting, outside helper on vehicle)
Methodology

Dependent Variables

- Safety practices
  - Supervision
    - Work is checked more than once per day
    - Never works completely alone
  - Training
    - Any training from employer
    - 6 safety topics
  - Personal Protective Equipment Use
    - 8 items (e.g., hard hat, safety goggles, gloves)
Sample Characteristics

Demographics
- 98% male
- 90% ages 16 or 17
- 88% white

Work characteristics
- 51% with family-firm connection
- 88% small workgroup (≤10 workers on site)
RESULTS

FAMILY-FIRM CONNECTION
Results - *Hazardous Exposures*

**Hazardous Equipment Used**

- **Razor/knife/box cutter**
- **Handsaw**
- **Power hand saw**
- **Motor vehicle**
- **Jackhammer/hammer drill**
- **Nail or staple gun**
- **Heavy vehicle**
- **Sledgehammer**
- **Power drill**

![Bar chart showing mean pieces of equipment used by individuals with and without a family tie.](chart)

- **No Family Tie (n=92)**
- **Has Family Tie (n=95)**

- Mean pieces of equipment used:
  - No FT = 4.7
  - Yes FT = 3.9*
Results - *Hazardous Exposures*

**Hazardous Tasks Performed**

- Lifted/carried objects 50+lbs
- Electrician/electrician’s helper
- Trenches/holes >4’ deep
- Roofing
- Outside helper on vehicle
- Open floor joists
- 6’ or more above ground

- **No Family Tie (n=92)**
- **Has Family Tie (n=95)**

**Mean tasks performed**

- No FT = 2.7
- Yes FT = 2.4

*Statistically significant difference.*
Results - *Safety Practices*

**Supervision**

- Has Family Tie (n=95)
- No Family Tie (n=92)

<table>
<thead>
<tr>
<th>Category</th>
<th>Has Family Tie</th>
<th>No Family Tie</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work checked more than once a day</td>
<td>70</td>
<td>60</td>
</tr>
<tr>
<td>Never worked completely alone</td>
<td>80*</td>
<td>60</td>
</tr>
</tbody>
</table>

* Asterisk indicates a significant difference.
Results - Safety Practices

Safety-related Training

- No Family Tie (n=92)  
- Has Family Tie (n=95)

- Tasks & equipment illegal for teens
- Handling situation where someone could get hurt
- Paying attention to hazards
- Using equipment safely
- Dressing appropriately for the job
- Using personal protective equipment

Mean training topics:
- No FT = 4.8
- Yes FT = 5.2
Results – *Safety Practices*

**Personal Protective Equipment Use**

- **Dust mask**
- **Work gloves**
- **Fall arrest equipment**
- **High visibility safety vest**
- **Earplugs**
- **Steel toed boots**
- **Safety glasses or goggles**
- **Hard hat**

**No Family Tie (n=92) vs. Has Family Tie (n=95)**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>No FT = 3.6</th>
<th>Yes FT = 3.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust mask</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work gloves</td>
<td></td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td>Steel toed boots</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety glasses or goggles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard hat</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Mean PPE used**
- No FT = 3.6
- Yes FT = 3.5
RESULTS

WORKGROUP SIZE
Results - Hazardous Exposures

Hazardous Equipment Used

- ≤10 (n=164)
- 11-15 workers (n=23)

Razor/knife/box cutter
Handsaw
Power hand saw
Motor vehicle
Jackhammer/hammer drill
Heavy vehicle
Power drill
Sledgehammer
Nail or staple gun

Mean
pieces of equipment
≤10 = 4.2
11-50 = 4.7
Results - **Hazardous Exposures**

**Hazardous Tasks Performed**

- ≤10 workers (n=23)  
- 11-50 workers (n=164)

- 6’ or more above ground
- Lifted/carried objects 50+lbs
- Electrician/electrician’s helper
- Trenches/holes >4’ deep
- Roofing
- Outside helper on vehicle
- Open floor joists

**Mean tasks performed**

- ≤10 = 2.6
- 11-50 = 2.7
Results - Safety Practices

Supervision

- 11-50 workers (n=164)
- ≤ 10 workers (n=23)

- Work checked more than once a day
- Never worked completely alone
Results - Safety Practices

Safety-related Training

- ≤ 10 workers (n=23)
- 11-50 workers (n=164)

- Paying attention to hazards
- Handling situation where someone could get hurt
- Using personal protective equipment
- Using equipment safely
- Tasks & equipment illegal for teens
- Dressing appropriately for the job

Mean training topics
≤10 = 5.0
11-50 = 5.2
Results – Safety Practices

Personal Protective Equipment Use

- ≤ 10 workers (n=23)
- 11-50 workers (n=164)

- Dust mask
- High visibility safety vest
- Earplugs
- Steel toed boots
- Fall arrest equipment
- Safety glasses or goggles
- Hard hat
- Work gloves

Mean PPE used
- ≤10 = 3.5
- 11-50 = 4.2

*Statistically significant difference
Conclusions
Conclusion - *Family Ties*

Youth with **FAMILY-FIRM TIES** report:

- using fewer pieces of dangerous equipment;
- performing fewer dangerous tasks;
- being less likely to work completely alone;
- receiving more safety training

All significant findings
Conclusions - Workgroup Size

- Few significant differences
  - Small cell sizes (n=23 in large workgroups)

- Patterns found in Small Workgroups
  - Exposure to Dangers
    - *Equipment* (7 of 9 less often)
    - *Tasks* (6 of 7 less often)
  - Safety Practices
    - *Safety Training Topics* (5 of 6 less often)
    - *PPE Use* (6 of 8)
    - *Not in the hypothesized direction*
      - *(Firm size effect?)*
**Strengths & Limitations**

- **Small cell sizes**
  - Unable to detect differences in workgroup size
  - Patterns found are suggestive

- **Weak measure of family ties**
  - Very mixed, doesn’t tell us the nature of the tie
  - Significant associations still found
Next Steps…

- Confirm protective effect of Family ties in larger study
- Develop & test better measures of family-firm connection
- Investigate whether the association exists in other workplaces
- Evidence suggestive of a workgroup size effect – warrants further study
Acknowledgements

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Study Authors

Kimberly Rauscher, MA, ScD  
Department of Community Medicine  
Injury Control Research Center, West Virginia University, USA  
krauscher@hsc.wvu.edu

Douglas J. Myers, MA, ScD  
Department of Community and Family Medicine  
Duke University, USA  
Douglas.myers@duke.edu

Carol W. Runyan, MPH, PhD  
Department of Health Behavior and Health Education  
Injury Prevention Research Center, University of North Carolina, USA  
Carol.Runyan@unc.edu

Michael Schulman, PhD  
Department of Sociology and Anthropology  
North Carolina State, USA  
michael_schulman@ncsu.edu
Thank you!