Work, Family, Health Study: Testing a Workplace Intervention on Daily Stress and Family Processes

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Overview

1. Brief overview of the Work, Family, Health Study

2. Intervention effects on global experiences

3. Daily diary design

4. Preliminary findings of effects on daily processes
The family and the workplace are “greedy institutions” that devour individuals’ time and energy.

-Coser & Coser, 1974
Work-Family Conflict

When the demands of **work** make it more difficult to perform your **family** responsibilities as a spouse, parent, or caregiver (and vice versa).
Work-Family Conflict & Health

- Work-family conflicts affect health and wellbeing
  - Impact on employees
  - Impact on families
  - Impact on employers

- Work-family issues are a public health concern
In 2005 NIH and CDC launched the WFHN:

- Harvard University
- Kaiser Permanente’s Center for Health Research
- Penn State University
- Portland State University
- Purdue University
- RTI International
- University of Minnesota
Pilot Studies Revealed 3 Key Factors

1. **Schedule control**
   - When and where work is done

2. **Supervisor support for work and family issues**

3. **Culture change**
   - Coworker support
   - Focus on results
Workplace Intervention Components

- Participatory sessions
- Supervisor training & behavior tracking
WFHS Conceptual Model

Fig. 15.1  Work, family, and health conceptual model
TIMELINE

Baseline
STAR
6 Month Follow-up
12 Month Follow-up
18 Month Follow-up
Industry Partners

■ “TOMO”
  ■ Information Technology (IT) division
  ■ Large, well-established company
  ■ One primary location with other satellites

■ “LEEF”
  ■ For-profit Health Care (HC) provider
  ■ Included 30 extended care facilities total
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Does STAR “work”?

- Compared to business as usual group, at the 6 month follow-up do employees who participated in STAR experience improvements in:
  - Schedule control?
  - Supervisor support for personal life?
  - Work-family conflict?
TOMO (IT) EMPLOYEE SAMPLE
N=823

BASELINE INTERVENTION SAMPLE
Study groups = 27
Employees = 423
Response rate = 68%

BASELINE CONTROL SAMPLE
Study groups = 29
Employees = 400
Response rate = 71%

STAR INTERVENTION

6 MONTH INTERVENTION SAMPLE
Study groups = 26
Employees = 371
Retention rate = 88%

6 MONTH CAPI CONTROL SAMPLE
Study groups = 29
Employees = 346
Retention rate = 87%

Final Analytic Sample = 346
Final Analytic Sample = 339
WFHS Intervention Effects

Was there significant improvement in the intervention targets and key outcomes for STAR group compared to UP from baseline to 6 months?

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<thead>
<tr>
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<tbody>
<tr>
<td>Schedule control</td>
<td>✓</td>
</tr>
<tr>
<td>Family supportive supervisory behaviors</td>
<td>✓</td>
</tr>
<tr>
<td>Work-to-family conflict</td>
<td>✓</td>
</tr>
<tr>
<td>Time adequacy for family</td>
<td>✓</td>
</tr>
</tbody>
</table>
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Day as the Unit of Analysis

Domains of Daily Experiences

- Time use (Sleep, Work and Social Support)
- Physical Symptoms (Duration and Intensity)
- Substance Use (Caffeine, Alcohol, Tobacco)
- Parental Knowledge & Parent-Child Interaction
- Positive and Negative Mood
- Productivity (Quantity and Quality)
- Stressors (including Work Family Conflict)
- Positive Events
- Supervisor Support
Overview of Daily Diary Collection

**Telephone Diary Collection Days**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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</table>

**Saliva Collection**

<table>
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<tr>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
</table>

- **A** Before Getting out of bed
- **B** 30-min After Getting Out of Bed
- **C** Before Lunch (Parents)
- **D** After Work
- **E** Before Bed
Daily Saliva Collection: 5x/day for 4 days

<table>
<thead>
<tr>
<th>SAMPLE #</th>
<th>TIMING</th>
<th>M TIME</th>
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<tbody>
<tr>
<td>Sample 1</td>
<td>Upon wakeup</td>
<td>6:42 AM</td>
</tr>
<tr>
<td>Sample 2</td>
<td>30 min. after wake</td>
<td>7:18 AM</td>
</tr>
<tr>
<td>Sample 3</td>
<td>Lunch</td>
<td>12:36 PM</td>
</tr>
<tr>
<td>Sample 4</td>
<td>After work</td>
<td>6:40 PM</td>
</tr>
<tr>
<td>Sample 5</td>
<td>Bedtime</td>
<td>9:23 PM</td>
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</table>
Diurnal Rhythm of Cortisol

Awakening Response

Area Under the Curve

Daily Decline
## Example Analyses: Measures

<table>
<thead>
<tr>
<th>Daily work-family conflict</th>
<th>5</th>
<th>5-20</th>
<th>Since this time yesterday, how much did the demands of your work life interfere with your family or personal life?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily negative affect</td>
<td>10</td>
<td>10-40</td>
<td>How much of the time today did you feel distressed?</td>
</tr>
<tr>
<td>Daily supervisor support</td>
<td>2</td>
<td>1-7</td>
<td>Since this time yesterday, how supportive was your supervisor about work and family issues?</td>
</tr>
</tbody>
</table>
Sources of Variability in Daily Health

- **Between-Person Differences**: Some *people* are less healthy than others.

- **Within-Person Variation**: Some *days* are less healthy than others.
Between and Within-Person Variability in Work-Family Conflict

Person 1 Mean
Person 2 Mean
Person 3 Mean

Person 1 Daily Variability
Person 2 Daily Variability
Person 3 Daily Variability
Daily Fluctuations of Work-family Conflict

DAY: Indicates which interview day 1–8
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Example Analyses: Supervisor Support and Daily Stress Processes

- Supervisor Support
- Daily Work-Family Conflict
- Negative Affect
- Cortisol

Exposure

Stress Reactivity

Buffer
Stress Reactivity: Between- and Within-Person Predictors of Daily Health

Within-person
L 1: Negative Affect\(_{di}\) = \(\beta_{0i} + \beta_{1i}(WFC_{di}) + r_{di}\),

Between-person
L 2: \(\beta_{0i} = \delta_{00} + \delta_{01}(WFC_{di}) + U_{di}\)
\(\beta_{1i} = \delta_{10} + U_{di}\)
Stress Reactivity: Daily Work-Family Conflict \(\rightarrow\) Negative Affect

People with more WFC overall experience more negative affect.
Stress Reactivity: Daily Work-Family Conflict → Negative Affect

On days with more WFC, individuals experience more negative affect.

People with more WFC overall experience more negative affect.
Exposure:
Supervisor Support $\rightarrow$ Daily WFC

People with more SS overall experience less WFC.
Exposure: Supervisor Support → Daily WFC

People with more SS overall experience less WFC.

On days with more SS, individuals experience less WFC.
Supervisor Support Buffers the Effect of Daily Stress Processes
Stress Reactivity: Work-Family Conflict → After Work to Bedtime Slope

People who reported more WFC experienced an increase in cortisol from after work to bedtime (trend level).
Stress Reactivity: Work-Family Conflict → After Work to Bedtime Slope

On days with more WFC, individuals experienced an increase in cortisol from after work to bedtime.
Buffer:
Daily Work-Family Conflict, Supervisor Support, and Interaction → After Work to Bedtime Slope

<table>
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<tr>
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<th>Model 0 Estimate (SE)</th>
<th>Model 1 Estimate (SE)</th>
<th>Model 2 Estimate (SE)</th>
<th>Model 3 Estimate (SE)</th>
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<td><strong>Effects</strong></td>
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<tr>
<td>Intercept</td>
<td>-.02 (.01)*</td>
<td>.03 (.04)</td>
<td>.01 (.05)</td>
<td>-.005 (.04)</td>
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<tr>
<td>Daily work-family conflict (between)</td>
<td>.01 (.006)†</td>
<td>.01 (.01)</td>
<td>.01 (.01)</td>
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<tr>
<td>Daily work-family conflict (within)</td>
<td>.01 (.005)*</td>
<td>.01 (.007)*</td>
<td>.01 (.007)*</td>
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<td>Supervisor Support (between)</td>
<td></td>
<td>- .005 (.02)</td>
<td>.002 (.01)</td>
<td></td>
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<tr>
<td>Supervisor Support (within)</td>
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<td>-.05 (.03) *</td>
<td>-.03 (.03)</td>
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<td><strong>Interaction</strong></td>
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<tr>
<td>W-F conflict (within) * SS (within)</td>
<td></td>
<td></td>
<td></td>
<td>-.03 (.01) **</td>
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<td><strong>Variance components</strong></td>
<td></td>
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<td>Between-variance left (ID)</td>
<td>.01***</td>
<td>.03***</td>
<td>.02 *</td>
<td>.01</td>
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<tr>
<td>Within-variance left (Residual)</td>
<td>.04***</td>
<td>.03***</td>
<td>.04***</td>
<td>.04***</td>
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<tr>
<td>(Pseudo R²)</td>
<td>(9.37%)</td>
<td>(13.12%)</td>
<td>(18.89%)</td>
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Example Analyses with Supervisor Support, Work-Family Conflict and Daily Health

Diagram:
- Supervisor Support
- Daily Work-Family Conflict
  - Exposure: W/n: -.10**, B/n: -.13**
  - Buffer: W/n WFCXW/n SS: -.03***
- Cortisol
  - Stress Reactivity: W/n: .01***, B/n: .01*

Key:
- **: p < .01
- ***: p < .001
Testing a Workplace Intervention on Daily Stress Exposure
TOMO Daily Diary Participants

- **Diary Study Design**

  - **Diary Sample** \((N=131)\)
  - **Workplace Intervention**
    - **Usual Practice** \((N=41)\)
    - **STAR Intervention** \((N=61)\)

  **Baseline** to **12 Month**
Intervention Effects on Daily Processes

**STAR Intervention**

- **Exposure** to Daily Work Experiences
- **Buffer**

- **Daily Work Experiences**
  - **Daily Family Experiences**
  - **Reactivity**
    - **Negative Affect**
    - **Cortisol**
Data Structure: Stacked Day X Burst X Person

<table>
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<tr>
<th>ID</th>
<th>DAY</th>
<th>WFC</th>
<th>Burst</th>
<th>Int</th>
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To capture within-person Intervention Effect
Effects of the Intervention on Stressor Exposure

**Within-person**

L 1: Variable\(_{dbi} = \pi_{0bi} + \epsilon_{dbi}\)

**Between-burst**

L 2: \(\pi_{0bi} = \beta_{00i} + \beta_{01i}(\text{Burst}_{bi}) + \beta_{02i}(\text{STAR}_{bi}) + V_{0bi}\)

**Between-person**

L 3: \(\beta_{00i} = \gamma_{000} + U_{00k}\)

\(\beta_{01i} = \gamma_{010}\)

\(\beta_{02i} = \gamma_{020}\)

Intervention Effect
Exposure Analyses

- WFC
- Number & Severity of Stressors (Work, Home, Total)
- Number & Severity of Physical Symptoms
- Supervisor Support
- Parental Knowledge
- Time with Target Child
Effects of the Intervention on Stressor Reactivity

**Within-person**

L 1: \( \text{NA}_{dbi} = \pi_{0bi} + \pi_{1bi}(\text{WFC}_{dbi}) + \varepsilon_{dbi} \)

**Between-burst**

L 2: \( \pi_{0bi} = \beta_{00i} + \beta_{01i}(\text{Burst}_{bi}) + \beta_{02i}(\text{STAR}_{bi}) + \beta_{03i}(\text{STAR}_{bi}) + V_{0bi} \)

\( \pi_{1bi} = \beta_{10i} + \beta_{11i}(\text{STAR}_{bi}) \)

**Between-person**

L 3: \( \beta_{00i} = \gamma_{000} + \gamma_{001}(\text{WFC}_{k}) + U_{00i} \)

\( \beta_{01i} = \gamma_{010} \)

\( \beta_{02i} = \gamma_{020} + \gamma_{021}(\text{WFC}_{i}) \)

\( \beta_{03i} = \gamma_{030} \)

\( \beta_{10i} = \gamma_{100} \)

\( \beta_{11i} = \gamma_{110} \)

Reactivity Effect

Intervention Effect on Reactivity
Next Steps: Linking across MANY data sources

- Children’s Diary
  - Crossover effects (self-report and cortisol)
- In Home and CAPI data
  - Personal, Home and Workplace predictors of exposure and reactivity
- Biomarkers
  - Daily Stress Processes Predict Health
  - Within Person Slopes as predictors
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<table>
<thead>
<tr>
<th>Investigators</th>
<th>Graduate Students</th>
<th>Research Techs</th>
</tr>
</thead>
<tbody>
<tr>
<td>David Almeida</td>
<td>Nicole DePasquale</td>
<td>Rosie Ammerman</td>
</tr>
<tr>
<td>Susan McHale</td>
<td>Kaylin Greene</td>
<td>Emily Fidler</td>
</tr>
<tr>
<td>Laura Klein</td>
<td>Katie Lawson</td>
<td>Sarah Gildea</td>
</tr>
<tr>
<td>Nan Crouter</td>
<td>Soomi Lee</td>
<td>Nathan Jones</td>
</tr>
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<table>
<thead>
<tr>
<th>Research Scientists</th>
<th>Graduate Students</th>
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<tbody>
<tr>
<td>Kelly Davis</td>
<td>Yin Liu</td>
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<td>Melissa Lippold</td>
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<td>Courtney Whetzel</td>
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<table>
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<tbody>
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<td>Yin Liu</td>
</tr>
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<td>Mary Burzinski</td>
<td>Alicia Revitsky</td>
</tr>
<tr>
<td>Jill Kile</td>
<td>Kim Walter</td>
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<td>Aimee Trabold</td>
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Thank you!