Understanding the Utility of Presenting Problem Patterns for Individualizing Services

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ORC Macro

Background
- Children enter systems of care with a wide variety of presenting problems, both internalizing and externalizing
- Understanding the differences and similarities of presenting problems among these children will help identify service needs and plan appropriate services that meet these individual needs
- Exploring the influence of these presenting problem patterns on service use and outcomes will help inform service planning for effective individualized services

Research Questions
- What are the various patterns of presenting problems among children referred for services in systems of care?
- What influence do these presenting problem patterns have on service use?
- Are there differential clinical outcomes for children who exhibit the various patterns of presenting problems?

National Evaluation of the Comprehensive Community Mental Health Services for Children and Their Families Program
- Program initiated in 1993 by Center for Mental Health Services
- Five-year outcome-based evaluation
- A total of 96 communities have been awarded grants since program’s inception

Methods
- Participants
  - Children 4 to 21 years old ($n = 13,497$) who were enrolled in the Comprehensive Community Mental Health Services for Children and Their Families Program
- Data Collection Method
  - Caregiver report of presenting problems leading to referrals for system-of-care services
  - Follow-up data were collected at 6 months post-entry into services (and every 6 months up to 36 months)

Analysis Strategy
- Latent Class Analysis
  - Attempts to categorize different patterns of characteristics into a small number of mutually exclusive classes, with each class having a distinct probability of endorsing each characteristic
  - Assigns individuals to latent classes based on responses to observed indicators
  - Identifies clusters of individuals who are similar with regard to indicator responses
Categorized Presenting Problem Indicators

Suicidality
- Self-injury
- Suicide Attempt
- Suicide Ideation
Depression-related
- Eating Disorders
- Sleep Disorders
- Somatic Complaints
- Sad
Anxious
Hyperactivity/Attention-related
- Hyperactive-impulsive
- Attentional Difficulties
Conduct-related
- Sexual Aggression
- Extreme Verbal Abuse
- Non-compliance
- Sexual Acting out
Other
- Threat to Life of Others
- Strange Behavior
- Other Problems

Sample Characteristics \((n = 13,497)\)

Gender
- Male 67.0%

Age
- Average 12.5 years
- 4 to 6 years 6.0%
- 7 to 11 years 28.7%
- 12 to 14 years 33.5%
- 15 to 18 years 30.9%
- 19 to 21 years 0.9%

Race/Ethnicity
- White, non-Hispanic 53.4%
- Black, non-Hispanic 24.2%
- Hispanic 8.7%

Family Income
- Below $15,000 46.9%
- $15,000 or more 53.1%

Sample Characteristics \((n = 13,497)\) (Continued)

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Model Fit Criteria For Males

<table>
<thead>
<tr>
<th>Number of Classes</th>
<th>AIC</th>
<th>BIC</th>
<th>SSABIC</th>
<th>Entropy</th>
<th>VLMS LRT</th>
<th>LRM Adjusted LRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6985.461</td>
<td>6983.227</td>
<td>6910.962</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
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<tr>
<td>2</td>
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<td>0.0001</td>
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<tr>
<td>4</td>
<td>6981.892</td>
<td>6979.527</td>
<td>6975.375</td>
<td>0.549</td>
<td>0.0501</td>
<td>0.0405</td>
</tr>
<tr>
<td>5</td>
<td>7062.821</td>
<td>7060.435</td>
<td>7056.957</td>
<td>0.614</td>
<td>0.0549</td>
<td>0.0570</td>
</tr>
</tbody>
</table>

Profile for Class 1 Solution: Males

Profile for Class 2: Males
Profile for Class 3: Males

Profile for Class 4: Males (n = 9,041)

Description of Classes For Males

Mean Age by Class Membership: Males

Race/Ethnicity by Class Membership: Males

Clinical Characteristics at Entry into Services by Class: Males
**Service Use by Class: Males**

<table>
<thead>
<tr>
<th>Class</th>
<th>Code Stabilization</th>
<th>Medication Monitoring</th>
<th>Day Treatment</th>
<th>Inpatient Hospital</th>
<th>Residential Treatment</th>
<th>After School Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18.3%</td>
<td>76.2%</td>
<td>11.1%</td>
<td>12.0%</td>
<td>8.0%</td>
<td>17.4%</td>
</tr>
<tr>
<td>2</td>
<td>15.4%</td>
<td>76.8%</td>
<td>14.5%</td>
<td>6.9%</td>
<td>5.0%</td>
<td>18.5%</td>
</tr>
<tr>
<td>3</td>
<td>18.9%</td>
<td>57.7%</td>
<td>5.5%</td>
<td>5.0%</td>
<td>10.7%</td>
<td>11.1%</td>
</tr>
<tr>
<td>4</td>
<td>23.7%</td>
<td>74.9%</td>
<td>16.0%</td>
<td>12.0%</td>
<td>11.6%</td>
<td>13.6%</td>
</tr>
</tbody>
</table>

*For all service categories, p < .05 after Bonferroni adjustment.*

**Clinical Characteristics at Baseline and 6 Months by Class: Males**

<table>
<thead>
<tr>
<th>Class</th>
<th>Mean CBCL Internalizing T-scores</th>
<th>Mean CBCL Externalizing T-scores</th>
<th>Mean CAFAS Total Scores</th>
<th>Mean BERS Strength Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BL 6 mo</td>
<td>BL 6 mo</td>
<td>BL 6 mo</td>
<td>BL 6 mo</td>
</tr>
<tr>
<td>1</td>
<td>68.64 64.50</td>
<td>68.78 64.35</td>
<td>104.51 92.38</td>
<td>93.93 94.51</td>
</tr>
<tr>
<td>2</td>
<td>68.95 66.56</td>
<td>64.09 61.20</td>
<td>100.84 90.45</td>
<td>91.77 94.00</td>
</tr>
<tr>
<td>3</td>
<td>69.71 66.12</td>
<td>63.85 61.02</td>
<td>111.83 96.84</td>
<td>88.57 92.60</td>
</tr>
<tr>
<td>4</td>
<td>72.71 68.58</td>
<td>69.41 65.08</td>
<td>125.57 106.53</td>
<td>85.38 90.07</td>
</tr>
</tbody>
</table>

p < .05 for all Class x Time interaction F-tests

**Model Fit Criteria For Females**

<table>
<thead>
<tr>
<th>Number of Classes</th>
<th>AC</th>
<th>BIC</th>
<th>SSABIC</th>
<th>Entropy</th>
<th>VLMR LRT</th>
<th>LMR Adjusted LRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>41216.350</td>
<td>41291.172</td>
<td>41333.928</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>2</td>
<td>38634.075</td>
<td>38670.797</td>
<td>38703.043</td>
<td>0.723</td>
<td>p &lt; 0.0001</td>
<td>p = 0.0001</td>
</tr>
<tr>
<td>3</td>
<td>38637.231</td>
<td>38683.461</td>
<td>38702.270</td>
<td>0.576</td>
<td>p = 0.0066</td>
<td>p = 0.0072</td>
</tr>
<tr>
<td>4</td>
<td>38638.021</td>
<td>38682.283</td>
<td>38703.778</td>
<td>0.584</td>
<td>p = 0.0002</td>
<td>p = 0.0002</td>
</tr>
<tr>
<td>5</td>
<td>38639.040</td>
<td>38675.526</td>
<td>38685.690</td>
<td>0.793</td>
<td>p &lt; 0.0001</td>
<td>p = 0.0001</td>
</tr>
<tr>
<td>6</td>
<td>38641.246</td>
<td>38642.165</td>
<td>38682.750</td>
<td>0.606</td>
<td>p = 0.0007</td>
<td>p = 0.0007</td>
</tr>
<tr>
<td>7</td>
<td>38699.417</td>
<td>38651.527</td>
<td>38706.750</td>
<td>0.700</td>
<td>p &lt; 0.0001</td>
<td>p = 0.0001</td>
</tr>
<tr>
<td>8</td>
<td>38707.922</td>
<td>38739.246</td>
<td>38719.899</td>
<td>0.674</td>
<td>p = 0.0099</td>
<td>p = 0.0030</td>
</tr>
</tbody>
</table>

**Profile for Class 1: Females**

- % Endorsing Indicators
  - Suicidality: 6%
  - Depression: 18%
  - Hyperactivity: 5%
  - Conduct: 1%
  - Delinquency: 8%
  - Adjustment: 12%
  - Other: 8%

**Profile for Class 2: Females**

- % Endorsing Indicators
  - Suicidality: 12%
  - Depression: 6%
  - Hyperactivity: 2%
  - Conduct: 13%
  - Delinquency: 18%
  - Adjustment: 12%
  - Other: 6%

**Profile for Class 3: Females**

- % Endorsing Indicators
  - Suicidality: 12%
  - Depression: 5%
  - Hyperactivity: 11%
  - Conduct: 28%
  - Delinquency: 18%
  - Adjustment: 11%
  - Other: 11%
Profiles for 7-Class Solution: Females (n = 4,456)

Description of Classes For Females

<table>
<thead>
<tr>
<th>Class</th>
<th>%</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.3</td>
<td>Other problems, including threat to life of others, strange behavior, and other problems (e.g., family violence/conflict, etc.)</td>
</tr>
<tr>
<td>2</td>
<td>7.8</td>
<td>Delinquency problems, low probability of endorsing all other problem categories</td>
</tr>
<tr>
<td>3</td>
<td>23.9</td>
<td>Conduct problems, moderate probability of delinquency and adjustment problems</td>
</tr>
<tr>
<td>4</td>
<td>23.4</td>
<td>Depression problems, moderate probability of suicidality, conduct, delinquency, adjustment, and other problems</td>
</tr>
<tr>
<td>5</td>
<td>13.4</td>
<td>Adjustment problems with hyperactive, depression, and conduct problems; low probability of suicidality, delinquency and other problems</td>
</tr>
<tr>
<td>6</td>
<td>11.8</td>
<td>Conduct problems with delinquency and adjustment, high probability of endorsing hyperactive problems, moderate depression and other problems</td>
</tr>
<tr>
<td>7</td>
<td>11.5</td>
<td>Severe problems in most areas, both internalizing and externalizing, highest probability of endorsing suicidality and depression problems</td>
</tr>
</tbody>
</table>

Age by Class Membership: Females

<table>
<thead>
<tr>
<th>Class</th>
<th>Mean Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.2</td>
</tr>
<tr>
<td>2</td>
<td>13.1</td>
</tr>
<tr>
<td>3</td>
<td>15.4</td>
</tr>
<tr>
<td>4</td>
<td>11.1</td>
</tr>
<tr>
<td>5</td>
<td>12.9</td>
</tr>
<tr>
<td>6</td>
<td>13.4</td>
</tr>
</tbody>
</table>

F = 56.06, df = 6, \( p < .001 \)
Race/Ethnicity by Class Membership: Females

Class Membership

Percent

0% 20% 40% 60% 80%

Class 1 Class 2 Class 3 Class 4 Class 5 Class 6 Class 7

Class 1 Class 2 Class 3 Class 4 Class 5 Class 6 Class 7

Clinical Characteristics at Entry into Services by Class: Females

<table>
<thead>
<tr>
<th>Class</th>
<th>Mean CBCL Externalizing T-scores</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>63.35</td>
<td>59.34</td>
<td>76.14</td>
<td>88.56</td>
</tr>
<tr>
<td>2</td>
<td>66.91</td>
<td>61.78</td>
<td>109.37</td>
<td>83.69</td>
</tr>
<tr>
<td>3</td>
<td>72.66</td>
<td>63.91</td>
<td>115.32</td>
<td>78.54</td>
</tr>
<tr>
<td>4</td>
<td>66.03</td>
<td>66.17</td>
<td>101.34</td>
<td>84.78</td>
</tr>
<tr>
<td>5</td>
<td>66.76</td>
<td>63.60</td>
<td>95.73</td>
<td>83.96</td>
</tr>
<tr>
<td>6</td>
<td>73.92</td>
<td>64.53</td>
<td>117.64</td>
<td>77.92</td>
</tr>
<tr>
<td>7</td>
<td>74.81</td>
<td>69.63</td>
<td>137.01</td>
<td>75.64</td>
</tr>
</tbody>
</table>

χ² = 232.354, df = 24, p < .001

Clinical Characteristics at Baseline and 6 Months by Class: Females

<table>
<thead>
<tr>
<th>Class</th>
<th>Mean CBCL Internalizing T-scores</th>
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</tr>
</thead>
<tbody>
<tr>
<td>BL</td>
<td>6 mo</td>
<td>6 mo</td>
<td>6 mo</td>
<td>6 mo</td>
</tr>
<tr>
<td>1</td>
<td>64.47</td>
<td>62.56</td>
<td>61.22</td>
<td>55.17</td>
</tr>
<tr>
<td>2</td>
<td>70.52</td>
<td>66.85</td>
<td>64.35</td>
<td>61.86</td>
</tr>
<tr>
<td>3</td>
<td>73.00</td>
<td>69.11</td>
<td>64.95</td>
<td>61.85</td>
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<tr>
<td>4</td>
<td>66.46</td>
<td>63.99</td>
<td>66.74</td>
<td>62.57</td>
</tr>
<tr>
<td>5</td>
<td>68.35</td>
<td>65.87</td>
<td>63.89</td>
<td>61.02</td>
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<td>73.95</td>
<td>71.67</td>
<td>64.15</td>
<td>62.48</td>
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<td>75.29</td>
<td>71.16</td>
<td>70.08</td>
<td>65.47</td>
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<tr>
<td>6 mo</td>
<td>76.40</td>
<td>76.98</td>
<td>70.08</td>
<td>65.47</td>
</tr>
</tbody>
</table>

p < .05 for all F-tests

Limitations

- Export of class memberships for descriptive analyses ignores contribution of each case to other class memberships
- Missing data at follow-up could impact generalizability of the findings for the sample as a whole

Summary

- Subgroups of children enter services with similar patterns of presenting problems that distinguish them from other subgroups
- Some children had co-occurring problems in both internalizing and externalizing domains
- Less heterogeneity among males' presenting problem patterns than females
- Class membership is associated with differences in demographic and clinical characteristics
Summary continued

- Classes for both males and females differed in use of medication monitoring, day treatment, residential treatment, and after school programs.
- Classes for males (but not females) differed in use of crisis stabilization and inpatient hospitalization.
- Classes for females (but not males) differed in use of group and family therapy and case management.
- Outcomes at 6 months for males differed by class on all clinical outcomes examined, but only on BERS for females.

Implications

- Differences in service use by class suggest SOC principle of individualized services is being realized in these communities.
- Service planning should take into consideration factors associated with presenting problem patterns, such as age or gender.
- Assessment of changes in outcomes should be specific to the particular pattern of presenting problems exhibited.