

**A Trauma-Informed Analysis
of the Profiles and Trajectories of
Youth in Group Care**

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Objectives

1. To present the findings of one of three studies, using data from the first Canadian longitudinal study of youth in child protective services (CPS) group home care on self-reported traumatic experiences and trauma-related symptoms (internalizing problems and externalizing behaviors)
2. To use a person-centered, non-linear, data reduction technique to explore the interactions between child maltreatment and trauma-related symptoms through clustering, and to further describe the clusters with relevant variables.

Why assess maltreatment experiences and trauma reactions among youth in group care?

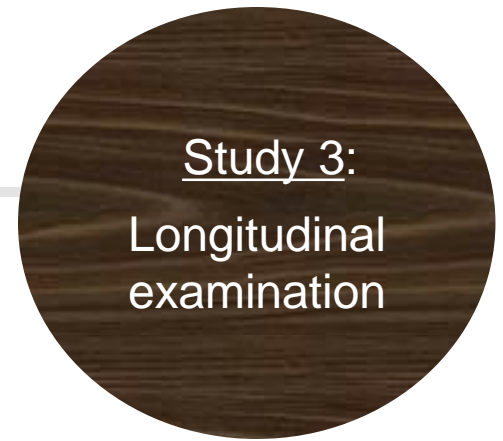
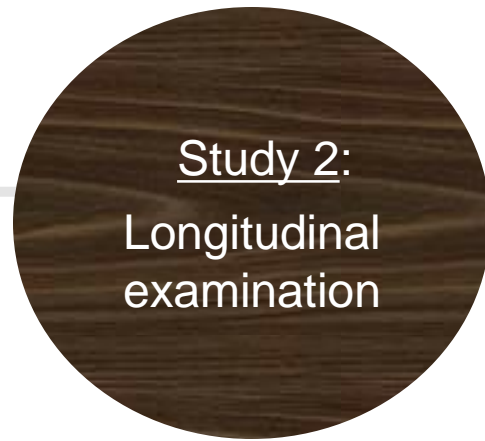
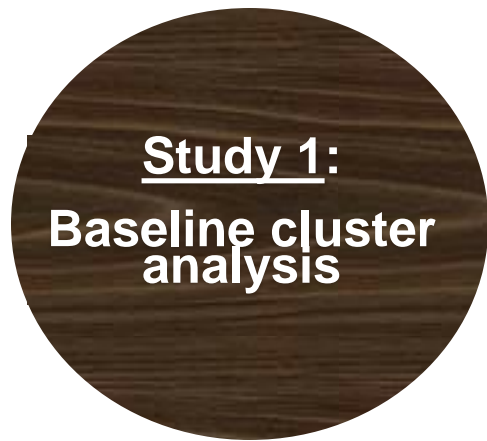
- Few assessment procedures in CPS to capture traumatic childhood experiences and impacts
- Especially concerning for youth in CPS group home care:
 - Maltreatment (compounded/polyvictimized)
 - Mental health problems
 - Externalizing and internalizing problems
 - Complex trauma
 - Impact on neurological development
 - Exhibit fewer adaptive behaviors than youth treated outside of care
 - Left untreated, can lead to severe problems later in life



Maltreatment and Adolescent Pathways (MAP) Study (Wekerle et al., 2007)

- MAP: first Canadian longitudinal study to capture the experiences of youth involved with CPS using measures across multiple domains
- Recruited youth 2002-2010; tested every 6 months over 3 years
- This portion of the study includes only youth who identified as living in a group home at the time of their initial participation in the study and who completed all measures in the analysis (n=122; final sample 96)





Sample

Total Sample (N=561)

Youth identified as living in a group home (N=146)

Youth who completed all measures in the analyses (N=122)


Youth removed for over- or under-reporting (N=26)

FINAL SAMPLE N=96

Method: Cluster Analysis

Goal: Better describe meaningful subgroups of youth – link to developmental/risk outcomes and potential interventions

Requires method attuned to multi-dimensional perspective:

- Maximize *within* group similarity and minimize *between* group similarity
 - Crucial to select variables consistent with relevant theoretical perspectives/expectations
 - Hierarchical cluster analysis derives mutually exclusive categories with underlying theoretical structure
 - Begins by linking observations closest to one another, continues until all variables joined in single cluster
 - Decide at which point clusters are most distinct
 - Critiques: Subjective; considered lacking somewhat in statistical sophistication
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Hypotheses

- Youth will cluster in groups based on levels of maltreatment severity and trauma symptom severity
- Trauma experience and trauma symptom severity will be significantly different among groups with respect to levels of anger, drug and alcohol use, risky sexual behavior motives, mental health symptoms, gender, length of time in care, & number of placement moves
- Females will be more represented in clusters with higher trauma symptom severity



Cluster Variables


Traumatic experiences (maltreatment)

Childhood Trauma Questionnaire (Bernstein & Fink, 1998)

- 28 items, 5 subscales: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect
- Severity ranges: none-minimal, minimal-moderate, moderate-severe, severe-extreme

Traumatic Reactions (trauma symptoms)

Trauma Symptom Checklist for Children (Briere, 1996)

- Youth self-report (54 items)
 - Target audience: 8-16 years
 - Subscales: Anxiety, depression, anger, post-traumatic stress, dissociation, sexual concerns
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Cluster validation variables


Demographic information

- Age, gender, length of time in CPS, number of placements, parent employment, finances, & education

Externalizing behaviors

- Anger: *State Trait Anger Expression Inventory* (Spielberger, 1988)(Anger-Trait total used)
- Substance use: *Rutgers Alcohol Problem Index* (White & Labouvie, 1989); *Drug Abuse Screening Test* (Skinner, 1982)(Total score used)
- Sexual behavior motives: *Sexual Motives Scale* (Cooper, Shapiro, & Powers, 1998)(3 risk-behavior subscales combined used)

Internalizing problems

- Global mental health symptoms: *Brief Symptom Inventory* (Derogatis, 1982)(Global Severity Index *T*-score used)
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Cluster Analysis process

- Imputed means for missing data (Little's M-CAR test)
- Hierarchical cluster analysis – Ward's method, squared Euclidian distance measure, scores standardized
- Derived 3- or 4-cluster solution according to agglomeration schedule and dendrogram
- 4-cluster solution determined to be best fit for the data (higher proportion correctly classified cases; separated out two groups of severely maltreated youth)
- Validated cluster solution with 5 random ½ samples and comparison group of 53 youth in residential care
- Discriminant Analysis conducted to determine distinction among clusters
- Validation: Follow-up Anova and X^2 tests with demographic variables and measures of internalizing and externalizing problems

Discriminant Analysis

Goal: Build a predictive model of group membership based on observed characteristics of each case

- Discriminant functions: combinations of several variables to maximize mean group difference [F -ratio]
- Entered 4 clusters derived from Hierarchical cluster analysis as DV, cluster analysis variables as IVs
- First two of three functions accounted for majority of variance [82% and 16.7%, respectively]
- Two functions reliably discriminated clusters
 - Function 1: .000*** / Function 2: .000*** / Function 3: .064[n.s]
- 94.8% of cases classified correctly [100%, 92%, 100%, 88%]

Table 1. Cluster Analysis Variables: mean scores (*SD*), and clinical/severity levels for overall sample and four clusters

	Overall Sample (n=96)	Group 1 No Maltreatment, Low Trauma (n=25)	Group 2 Low-Moderate Maltreatment, Moderate Trauma (n=37)	Group 3 Moderate-Severe Maltreatment, Low Trauma (n=18)	Group 4 Severe Maltreatment, Severe Trauma (n=16)	F-statistic (significance)
Emotional abuse	13.01(6.19) Moderate	6.24(1.71) ^{b,c,d} None	12.51(4.26) ^{a,c,d} Moderate	17.83(5.14) ^{a,b} Severe	19.31(4.14) ^{a,b} Severe	47.254***
Physical abuse	11.63(6.14) Moderate	5.92(1.73) ^{b,c,d} None	9.95(3.91) ^{a,c,d} Moderate	19.56(3.95) ^{a,b,d} Severe	15.5(5.19) ^{a,b,c} Severe	54.271***
Sexual abuse	8.58(5.85) Moderate	5.44(1.82) ^d None	6.97(3.53) ^d Low	7.78(4.08) ^d Moderate	18.13(6.50) ^{a,b,c} Severe	38.362***
Emotional neglect	13.83(6.09) Low	6.92(2.1) ^{b,c,d} None	14.23(5.02) ^{a,c,d} Low	19.81(3.04) ^{a,b,d} Severe	17.00(4.88) ^{a,b,c} Moderate	40.131***
Physical neglect	9.47(4.14) Low	5.48(0.77) ^{b,c,d} None	9.47(3.18) ^{a,c,d} Low	12.33(4.31) ^{a,b} Moderate	12.5(4.06) ^{a,b} Severe	22.514***
Trauma-related symptoms	44.33(32.64) Moderate	30.31(21.68) ^d Low	41.03(19.0) ^d Moderate	29.57(21.94) ^d Low	90.47(41.20) ^{a,b,c} Severe	22.913***

*** $p < .001$

^a Different from cluster 1

^b Different from cluster 2

^c Different from cluster 3

^d Different from cluster 4.

Chart 1. Profiles of youth in group care

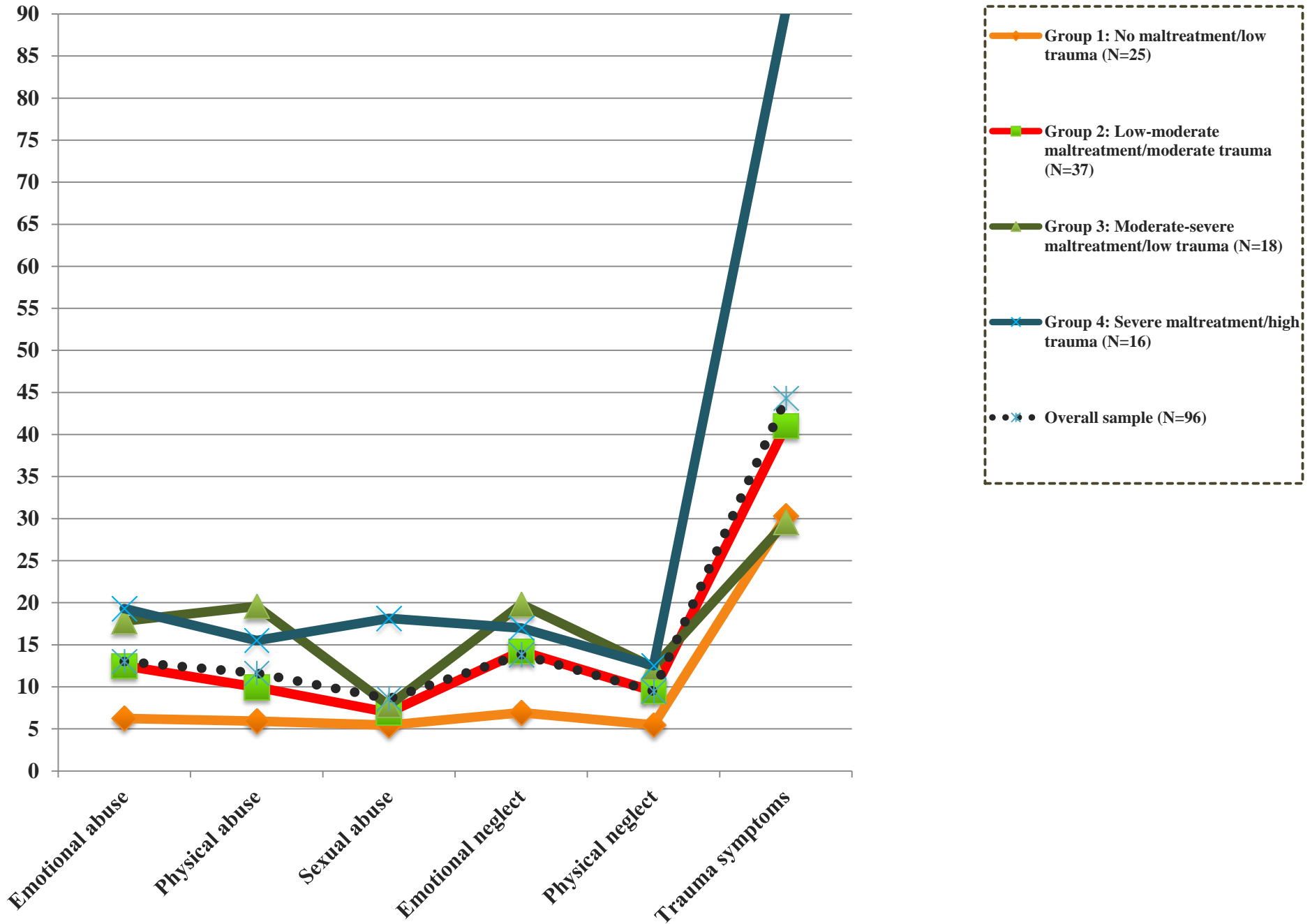


Table 2. Demographic validation variables (N/%) and χ^2 for overall sample and four clusters

	Overall Sample (N=96)	Group 1 No Maltreatment, Low Trauma (N=25)	Group 2 Low-Moderate Maltreatment, Moderate Trauma (N=37)	Group 3 Moderate-Severe Maltreatment, Low Trauma (N=18)	Group 4 Severe Maltreatment, Severe Trauma (N=16)	Chi-2 (significance)
Gender						
Female	50(52.1)	9(36.0)	21(56.8)	7(38.9)	13(81.2)	.022*
Male	46(47.9)	16(64.0)	16(43.2)	11(61.1)	3(18.8)	
Ethnicity						
Caucasian	42(43.8)	11(44.0)	18 (48.6)	6(33.3)	7(43.8)	.477(n.s.)
African Canadian	21(21.9)	4(16.0)	8(21.6)	6(33.3)	3(18.8)	
Mixed Ethnicity	20(20.8)	8(32.0)	4(10.8)	3(16.7)	5(31.3)	
Other	13(13.5)	2(8.0)	7(18.9)	3(16.7)	1(6.3)	
CPS Status						
Crown ward	53(55.2)	13(52.0)	20(54.1)	12(66.7)	8(50.0)	.811(n.s.)
Society ward	30(31.3)	7(28.0)	13(35.1)	5(27.8)	5(31.3)	
Interim ward	12(12.5)	4(16.0)	4(10.8)	1(5.6)	1(5.6)	
Parent finances						
Below average	24(27.6)	2(9.1)	8(24.2)	10(55.6)	4(28.6)	.062(n.s.)
Average	37(42.5)	11(50.0)	15(45.5)	6(33.3)	5(35.7)	
Above average	26(29.9)	9(40.9)	10(30.3)	2(11.1)	5(35.7)	
Mother employment (N=82)						
Unemployed	16(19.5)	2(9.1)	8(26.7)	6(35.3)	0(0.0)	.013*
Part-time	22(26.8)	2(9.1)	9(30.0)	5(29.4)	6(46.2)	
Full-time	44(53.7)	18(81.8)	13(43.3)	6(35.3)	7(53.8)	
Father employment (N=78)						
Unemployed	6(7.7)	0(0.0)	3(9.1)	2(18.2)	1(8.3)	.450(n.s.)
Part-time	12(15.4)	2(9.1)	7(21.2)	1(9.1)	2(16.7)	
Full-time	60(76.9)	20(90.9)	23(69.7)	8(72.7)	9(75.0)	
Mother education (N=77)						
Some elem./h.s.	38(46.9)	5(25.0)	13(43.3)	13(81.3)	7(46.7)	.084(n.s.)
Grad high school	19(23.5)	7(35.0)	7(23.3)	1(6.3)	4(26.7)	
College/University	20(24.7)	8(40.0)	8(26.7)	1(6.3)	3(20.0)	
Father education (N=39)						
Some high school	6(15.4)	1(9.1)	2(11.8)	3(50.0)	0(0.0)	.176(n.s.)
Grad high school	10(25.6)	2(18.2)	5(29.4)	2(33.3)	1(20.0)	
College/University	23(59.0)	8(72.7)	10(58.8)	1(16.7)	4(80.0)	

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3. Validation variables (demographic, internalizing and externalizing problems) means (*SD*) and clinical levels for overall sample and four clusters

	Overall Sample (N=96)	Group 1 No Maltreatment, Low Trauma (N=25)	Group 2 Low-Moderate Maltreatment, Moderate Trauma (N=37)	Group 3 Moderate-Severe Maltreatment, Low Trauma (N=18)	Group 4 Severe Maltreatment, Severe Trauma (N=16)	F-statistic (significance)
Age (years)	15.68(.93)	15.56(.91)	15.67(.94)	15.66(1.02)	15.93(.85)	.536(n.s.)
Length of time CPS	4.59(3.56)	4.38(3.89)	4.23(3.42)	4.88(3.21)	5.34(4.12)	.316(n.s.)
# Moves (5 yrs.)	4.94(2.99)	4.58(2.71)	4.92(3.10)	5.34(2.35)	4.77(3.98)	.192(n.s.)
Global mental health symptoms	52.14(12.80)	47.16(8.63) ^d	51.35(10.74) ^d	46.00(10.69) ^d	68.63(11.59) ^{a,b,c} Clinical	21.56***
Anger ~ Clinical	21.28(7.06)	20.41(6.41) ^d	19.9(6.53) ^d	20.85(6.77)	26.33(7.92) ^{a,b} Clinical	3.613*
Sexual behavior motives ¹	18.53(17.07)	15.99(14.72)	19.58(17.60)	18.72(15.26)	19.83(21.85)	.257(n.s.)
Drug use	5.56(5.86) Clinical (screen)	5.55(5.85) Clinical (screen)	5.61(5.86) Clinical (screen)	5.04(5.08) Clinical (screen)	6.07(7.10) Clinical (screen)	.086(n.s.)
Alcohol use ¹	9.1(11.82) Clinical	6.67(8.99)	10.89(13.28) Clinical	5.67(6.87)	12.61(15.32) Clinical	1.639(n.s.)

* $p < .05$, ** $p < .01$, *** $p < .001$.

¹ Different from cluster 1

² Different from cluster 2

³ Different from cluster 3

⁴ Different from cluster 4.

¹ There is no clinical cut-off for this measure. However, a mean score of 8.30+ is considered 'heavy consequence' drinking (Thombs & Beck, 1994).

Description of Cluster 1:

“No Maltreatment, Low Trauma”

- N=25 (second largest cluster - 26% of sample)
- Majority male, Caucasian, wards of the state
- No (minimal) maltreatment, low trauma symptoms
- Compared to other clusters:
 - **Largest** proportion of higher levels of parental finances, employment, education (father second highest)
 - Mean scores **lowest** on sexual behavior motives, # moves (past 5 years)
 - Second lowest mean scores on anger, global mental health symptoms, alcohol use, drug use (screening suggested)
 - Mean # of maltreatment experiences=.52*** (significantly lower than other clusters)

SUMMARY: Low levels of everything, overall parental situation doesn't appear to have created adversity. Begs question as to why in group care. Possibilities: Under-reporting (defensiveness/denial); parental abandonment; unmeasured conduct problems.

***Further examination required to determine appropriate interventions.*

Description of Cluster 2:

“Low-Moderate Maltreatment, Moderate Trauma”

- N=37 (largest cluster - 38.5% of sample)
- Majority female, Caucasian, state wards
- Low-moderate maltreatment severity (moderate emotional and physical abuse, low sexual abuse, emotional neglect, and physical neglect); moderate trauma symptoms
- Compared to other clusters:
 - Average levels of parental finances, employment, education
 - Mean scores second highest on global mental health symptoms, sexual behavior motives, alcohol use (clinical), drug use (screening suggested), # moves
 - **Lowest** anger scores
 - Mean # of maltreatment experiences=3.3

SUMMARY: Low-moderate maltreatment and trauma symptoms. Fits expected ‘profile’ of many CPS youth in group care (parallels overall sample profile).

***Interventions should target relatively high internalizing/ externalizing behaviors.*

Description of Cluster 3:

“Moderate-Severe Maltreatment, Low Trauma”

- N=18 (3rd largest cluster - 19% of sample)
- Majority male, Caucasian/African Canadian, largest proportion state wards (67%)
- Moderate-severe maltreatment severity (severe emotional abuse, physical abuse, emotional neglect, moderate sexual abuse, physical neglect); low trauma symptoms
- Compared to other clusters:
 - **Lowest** parental finances, education, mother’s employment
 - **Lowest global** mental health symptoms, alcohol use, drug use (screening still suggested)
 - Second lowest sexual behavior motives, second highest anger (still low)
 - **Highest #** moves
 - Mean # maltreatment experiences=4.33*** (significantly higher than other clusters) (‘polyvictimized’)

SUMMARY: Despite adversity (severe maltreatment, # moves), seemingly doing well - considered ‘resilient’?

***Interventions should capitalize on building strengths, while ensuring safety/ mental and emotional well-being. *However, should also be aware of potential minimization of trauma-related symptoms.*

Description of Cluster 4:

“Severe Maltreatment, High Trauma”

- N=16 (smallest cluster-16.5% of sample)
- Great majority female (81%), majority Caucasian, state wards
- Severe maltreatment (except moderate emotional neglect); high trauma symptoms
- Compared to other clusters:
 - Relatively average levels of parent finances, education, employment
 - **Highest** mean scores on global mental health symptoms (clinical level), anger (clinical level), sexual behavior motives, alcohol use (clinical), drug use (screening suggested), length of time in CPS
 - Mean # maltreatment experiences=4.69*** (significantly higher than other clusters) (‘polyvictimized’)

SUMMARY: Cluster of youth with very severe maltreatment and internalizing trauma symptoms.

***Interventions should include specialized treatment in all areas.*

Hypothesis findings

- As hypothesized, youth generally clustered together on the basis of maltreatment and trauma severity
- However, a small group who experienced fairly severe maltreatment showed low trauma symptoms
- In contrast to hypotheses, only anger, global mental health symptoms, and mother's employment were significantly different among clusters
- As hypothesized, females were most highly represented in clusters with higher trauma symptom severity

Overall sample:

- Females had significantly higher mean scale scores for emotional abuse [$p < .01$]; sexual abuse [$p < .01$]; trauma symptom score [$p < .01$]; global mental health problems [$p < .05$]
- For both males and females, though consistent with cluster analysis results, all other cluster and validation variables were unexpectedly non-significant

Take-away messages

- Cluster analysis can provide identifiable youth profiles consistent with theoretical expectations, *yet also provide additional information than is possible in linear analyses*
- No one particular maltreatment type stands out – more important to pay attention to severity and co-occurrence?
- Overall, youth reported higher levels of traumatic experiences and trauma-related symptoms than found in the general population
- Youth perspectives are essential to fully understand experiences, in order to link to trauma symptoms
- Findings strongly support the need to conduct regular trauma-informed, strengths-based CPS assessments to provide fitting interventions that also build resilience (flexible, trauma-informed interventions [e.g., Attachment, Self-Regulation, Competency (ARC)])

Strengths and Limitations


Strengths

- Random sample
- Self-reports
- Close attention to youth self-report validity concerns
- Validation of clusters with other samples
- Longitudinal study (clusters to predict future functioning)

Limitations

- Exclusion from the study of youth with severe problems
- Gatekeepers
- Potential under-reporting by youth
- Different baselines
- Missing responses
- Non-normal distributions for two cluster analysis variables

Future research

- More longitudinal studies, larger samples, attention to missing data, longer follow-up post-CPS
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Discussion Questions

1. At what point does transforming variables to achieve normal distribution distort the data so that it is much less meaningful (and interpretable)?
2. In a similar vein, what is the general opinion on removing outliers – which can impact cluster analysis results – given our need to understand youth with (legitimate) extreme scores?
3. What are some interesting longitudinal analyses (at 6 and 18 months) that could be conducted to build upon these baseline cluster analysis results?

THANK-YOU!

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