

The Importance of Degree Versus Type of Maltreatment: A Cluster Analysis of Child Abuse Types

DARYL J. HIGGINS
 School of Psychology
 Deakin University, Australia

ABSTRACT. The author conducted secondary data analysis of 3 previously reported studies (D. J. Higgins & M. P. McCabe, 1998, 2000b, 2003) to examine whether respondents are best classified according to their experience of separate maltreatment types (sexual abuse, physical abuse, psychological maltreatment, neglect, and witnessing family violence) or whether their experience reflects a single unifying concept: *child maltreatment*. The author conducted a cluster analysis of the combined dataset followed by a confirmatory discriminant function analysis. Finally, the differences in psychological adjustment between those classified into the 3 different clusters were examined as a test of the 3-cluster solution. The best cluster analysis solution grouped individuals according to the degree to which maltreatment behaviors were reported. Individuals classified into the high maltreatment cluster had significantly more adjustment problems than those in either the moderate or the low maltreatment clusters. The results showed that it may be more meaningful to talk about the *degree* of maltreatment (frequency and/or severity) experienced by the child rather than about the *type*.

Key words: child abuse, definitions, maltreatment, multitype maltreatment, neglect, typologies

CHILDREN ARE PARTICULARLY VULNERABLE to different kinds of victimization because of developmental immaturity—physical, cognitive, and emotional (Finkelhor & Dzuiba-Leatherman, 1994). Researchers have identified a range of different maltreatment types to which children are subjected that are defined either by perpetrator behavior or by the resulting type of harm to the child. What researchers rarely ask is whether child maltreatment is a unidimensional or a multi-

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Address correspondence to Daryl J. Higgins, School of Psychology, Deakin University, Geelong, Victoria, Australia, 3217; dhiggins@deakin.edu.au (e-mail).

dimensional construct. Is each maltreatment type a discrete entity or is each a symptom or facet of a single underlying construct: *child maltreatment*?

Child maltreatment research has developed considerably in the past 40 years since the issue first came to public recognition with the publication of the first paper on physical abuse in 1962 (Kempe, Silverman, Steele, Droegemueller, & Silver, 1962). During the past 2 decades in particular, extensive attention has been given to evaluating the prevalence and impact of childhood experiences of sexual abuse (Rind & Tromovitch, 1997; Rind, Tromovitch, & Bauserman, 1998) and, to a lesser extent, physical abuse and physical neglect (Malinosky-Rummell & Hansen, 1993). More recently, attention has been directed toward understanding the nature, prevalence, and consequences of psychological maltreatment (Briere & Runtz, 1988, 1990; O'Hagan, 1995) and of witnessing family violence during childhood (Parkinson & Humphreys, 1998). Researchers have typically examined each of the types of child maltreatment in isolation, with little attempt to evaluate their coexistence or the long-term correlates of experiencing multiple types of maltreatment (Rosenberg, 1987).

Researchers currently talk about five different types of child maltreatment: (a) sexual abuse; (b) physical abuse; (c) psychological maltreatment, including emotional abuse and psychological neglect; (d) physical neglect; and (e) witnessing family violence. However, there is a growing body of evidence to show that maltreatment types do not occur independently and that a significant proportion of maltreated individuals experience not just repeated episodes of one type of maltreatment, but are likely to be the victim of other forms of abuse or neglect. The term *multitype maltreatment* can be used to describe the experiences of individuals who have been exposed to abusive or neglectful behaviors in more than one of the five categories mentioned (Higgins & McCabe, 2000a).

Children from "depriving" families experience the lack of parental or caregiver love and protection in multiple ways. In fact, more often than not, parents' (or other adults') behaviors fall into more than one category. The experience of multitype maltreatment is associated with greater impairment than single forms of maltreatment (Higgins & McCabe, 2001b; Ney, Fung, & Wickett, 1994).

Researchers rarely question whether the seemingly discrete categories that are used are in fact discrete or whether they are facets of the single construct of child maltreatment. Although some researchers have engaged in definitional debates about specific subcategories, especially neglect and psychological or emotional abuse (e.g., O'Hagan, 1995), they have avoided asking whether the distinctions between the five broad categories of child maltreatment reflect real differences between the types or whether there is only one core construct.

Researchers' lack of understanding about the nature of maltreatment has important consequences. Currently, there is no comprehensive theory to explain the specific effects of any of the maltreatment types. The lack of taxonomic delineation has resulted in poor understanding of whether or not there are abuse-specific adjustment problems and whether there are separate risk factors for dif-

ferent maltreatment types. Researchers have not applied empirical approaches to the development of a taxonomy of child maltreatment (principally a conceptual approach to classification).

However, cluster analysis has been used to develop typologies for a range of different behaviors, psychological conditions, and medical conditions, with subsequent implications for understanding risk factors and for differential treatment strategies. These have included rape (Knight, 1999), schizophrenia (Catalano, 1999), obsessive-compulsive disorder (Calamari, Wiegartz, & Janeck, 1999), stress (Hinds & Burroughs, 1997), diabetes (Nouwen, Gingras, Talbot, & Bouchard, 1997), and adherence to exercise behavior (Godin, Valois, & Deshar-nais, 2001). A classification system needs to be developed empirically that accounts for the diversity of situations in which children experience abusive or neglectful behaviors.

The aim of this study was to re-analyze existing datasets in which five different types of child abuse and neglect were measured. I used cluster analysis to differentiate between subgroups in a taxonomy of child maltreatment to see whether or not reports of different types of maltreatment cluster separately into the a priori categories currently used by researchers. Cluster analysis allowed me to compare differences in outcomes for victims. Planned comparisons were conducted to see whether the clustering solutions were meaningful in differentiating between levels of psychological adjustment.

Method

I pooled three separate databases to create a 363-case dataset of perceptions of maltreatment using the Comprehensive Child Maltreatment Scales-Parent (CCMS-P) and Adult (CCMS-A) versions (Higgins & McCabe, 2001a). The data had been collected as part of three larger studies of childhood relationships, family functioning, and adult adjustment (Higgins & McCabe, 1998, 2000b, 2003).

Participants in Database 1: CCMS-A (n = 175)

A self-selected community sample of 175 adults (128 women, 73.1%; 46 men, 26.3%; 1 not specified) reported retrospectively on their own experiences of child maltreatment using behavior-specific questions relating to the domains of sexual abuse, physical abuse, psychological maltreatment, neglect, and witnessing family violence. The mean age of respondents was 31.5 years ($SD = 11.0$), with a modal age of 18 years.

Materials

The CCMS-A is a retrospective self-report measure of adults' perceptions of their childhood experiences of abusive and neglectful behaviors (Higgins &

McCabe, 2001a). Respondents rate the frequency with which they believe themselves to have been subjected—as a child—to behaviors (categorized a priori by the researcher) such as sexual abuse, physical abuse, psychological maltreatment, neglect, and witnessing family violence. To have a more behavior-oriented measure of sexual abuse frequency, the 11 sexual abuse items are rated on a 6-point scale: *never* (0), *once* (1), *twice* (2), *3–6 times* (3), *7–20 times* (4) and *more than 20 times* (5). Respondents answer each item three times¹ in relation to their (a) mother, (b) father, and (c) other adult or an adolescent at least 5 years older than the respondent.

Physical abuse, psychological maltreatment, and neglect scales each contain three items rated on a 5-point scale ranging from *never or almost never* (0) to *very frequently* (4) in relation to the respondent's (a) mother, (b) father, and (c) other adult or older adolescent. Witnessing family violence has only two items, rated on a 5-point scale ranging from *never or almost never* (0) to *very frequently* (4). Unlike the other four scales, these two items require a global response concerning family violence that was witnessed (cf., behaviors of mother, father, and other adult or older adolescent). Scores on all five scales can be summed to produce a total score (for details of the psychometric properties, see Higgins & McCabe, 2000b, 2001a). For planned comparisons of the cluster solutions extracted, data from two measures of psychological adjustment were used: Rosenberg's Self-Esteem Scale (Rosenberg, 1965) and the Trauma Symptom Checklist (TSC-40; Briere & Runtz, 1989).

Procedure

I recruited the respondents from medical centers, counseling agencies, child care centers, health and fitness centers, and maternal and child health centers in metropolitan and regional areas in Victoria, Australia, and among students completing first year psychology at a regional campus of a multicampus Australian university. Posters advertising the study were placed above a pile of questionnaires and a box for respondents to anonymously return completed questionnaires.

Participants and Procedure for Database 2: CCMS-A (n = 138)

I used the CCMS-A (as described for Database 1) and recruited 19 men (13.8%) and 119 women (86.2%) from a variety of health and community organizations in regional and metropolitan Victoria, Australia. The mean age of respondents was 46.1 years ($SD = 11.17$), with a modal age of 45 years. The

¹The only exceptions are two of the items from the sexual abuse scale (Items 3 and 8) that participants respond to only twice. These items refer to behaviors that can only be performed by a male ("showed you his erect penis," and "put his penis in your vagina or anus"). Therefore, respondents are asked to answer only in relation to behaviors directed toward them by their father or other adult or older adolescent.

respondents were recruited through descriptions of the research project reported in newspaper articles or radio interviews and on posters displayed in medical or health care centers. The articles, interviews, and posters informed people that they would be asked about childhood experiences (both positive and negative) and about different aspects of family life and current adjustment. A telephone number was provided for people to call if they wanted to participate. Through voice-mail facilities, prospective respondents would listen to a recorded welcome message about the project and leave their names and addresses. Questionnaires were sent out to 157 people; 138 were returned, reflecting a response rate of 87.9%.

Participants and Procedure for Database 3: CCMS-P (n = 50)

Respondents were recruited at the same time as the respondents in Database 2. They were invited to participate in a study of “relationships, family functioning and adjustment of primary school-aged children.” Forty-three respondents (86%) were women, and the children selected by the respondents to be the targets of study were 28 boys and 22 girls.

Materials

The CCMS-P is a measure of parents’ perceptions of their child’s experiences of abusive and neglectful behaviors (Higgins & McCabe, 2001a). The CCMS-P is identical to the CCMS-A, with second-person pronouns changed to the third-person (i.e., you = the child, your = your child’s). The child’s psychological adjustment was determined using parental ratings on four outcome measures: self-derogation (one item), gender-identity satisfaction (one item), sexual behaviors (Child Sexual Behavior Inventory; Friedrich, Grambsch, Broughton, Kuiper, & Beilke, 1991), and behavioral adjustment (Child Behavior Checklist; Achenbach, 1991).

Analysis Design

I examined childhood maltreatment items for commonalities in two different ways in the pooled dataset: by entering the items grouped according to behavior (i.e., scores were summed across the three potential perpetrators—mother, father, and other adult or older adolescent—for each item; e.g., “forced to watch others having sex”) and by entering the items grouped according to perpetrator (i.e., scores for each item within an abuse type were summed separately for mother, father, and other adult or older adolescent; e.g., “father’s physical violence”).

Although the results sections of these two analysis designs are different and are reported separately, they share the same method (see Figure 1 for an overall plan of the analyses). In the behavior analysis, 21 maltreatment behaviors were examined (sexual abuse = 11; psychological maltreatment = 3; physical abuse =

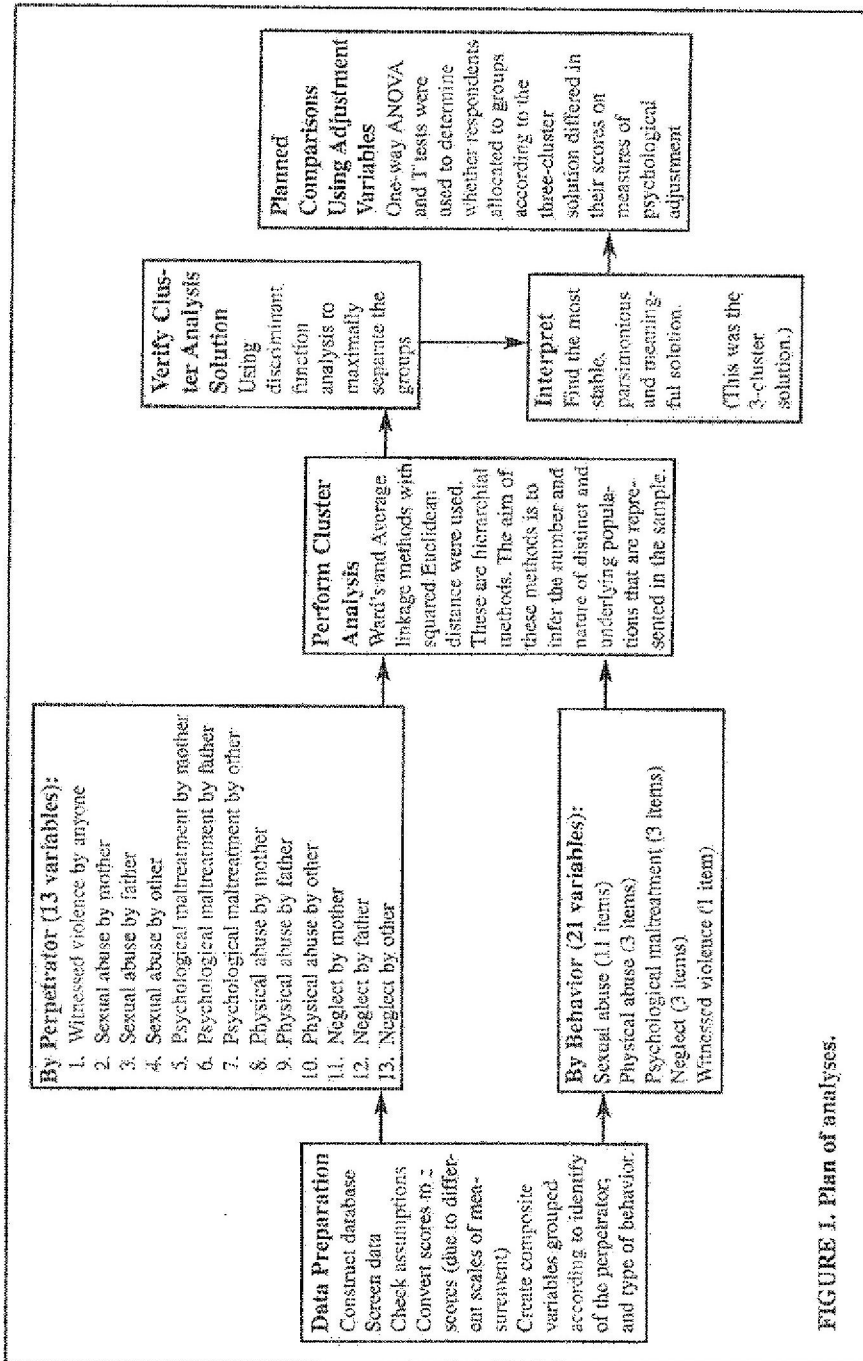


FIGURE 1. Plan of analyses.

3; neglect = 3; and witnessing family violence = 1) without regard for the identity of the perpetrator(s). In the perpetrator analysis, 12 maltreatment behaviors were examined, grouped by perpetrator—mother, father, or other adult or older adolescent—for each of four maltreatment types (sexual abuse, physical abuse, psychological maltreatment, and neglect). An additional item was examined for witnessing family violence in which the identity of the perpetrator was not identified, as this item—by definition—involves multiple perpetrators enacting the violence that the child witnessed.

I used cluster analysis to explore the number and nature of distinct and underlying populations that were represented in the pooled dataset of reported experiences of childhood maltreatment. I performed an initial cluster analysis on the items summed by perpetrator (13 items), and another analysis was performed on the items summed by behavior type (21 items). Cluster analysis is similar to discriminant function analysis in that it is used to classify individuals into uniquely defined groups. However, it differs from discriminant analysis, which is used when group membership is known, in that cluster analysis deals with classification problems when it is not known beforehand from which subgroups cases originate (Johnson, 1998).

The 13 perpetrator variables and 21 behavior variables used to define the clusters were standardized because the response options were not the same for all variables (Godin et al., 2001). Cluster analysis is partially a subjective technique, as the researcher must decide how many distinct and underlying populations are to be recognized in the data. Therefore, the choice of the final cluster solution should ideally be based on (a) the use of different methods to assess the stability of the cluster solution, (b) the use of random subsamples to verify parent sample findings, and (c) the validation of cluster solutions by discriminant function analysis (Johnson, 1998).

In this study, I used two different cluster analysis methods—Ward's minimum variance and average linkage—as they are not only among the most commonly used agglomerative hierarchical techniques but are generally considered to be the best (Johnson, 1998). To perform a cluster analysis, the similarity or dissimilarity between two individual cases must be able to be measured. Both methods in this study used squared Euclidean distance, which calculates the distance between two cases by summing the squared differences between values for each variable. Ward's method searches the proximity matrix as calculated by the squared Euclidean distance and then groups the two individuals with the smallest distance value. Average linkage computes the average similarity of one individual with all other individuals in the cluster and links pairs of individuals with the lowest average similarity.

In sum, I made the choice of the final cluster solution (i.e., one for each of the perpetrator and behavior analyses) after considering the results of the two different cluster analysis methods performed on the full dataset as well as on randomly generated subsamples. The solution was then validated by discriminant

function analysis to assess whether the 13 perpetrator and the 21 behavior variables could be combined to reliably discriminate between the groups as classified by the cluster analysis. The purpose of the planned comparisons was to examine whether participants allocated to distinct groups differed in terms of their psychological adjustment. The interpretation of the final cluster solutions was based on the group means and standard deviations for the 13 variables in the perpetrator analysis and the 21 variables in the behavior analysis.

Results

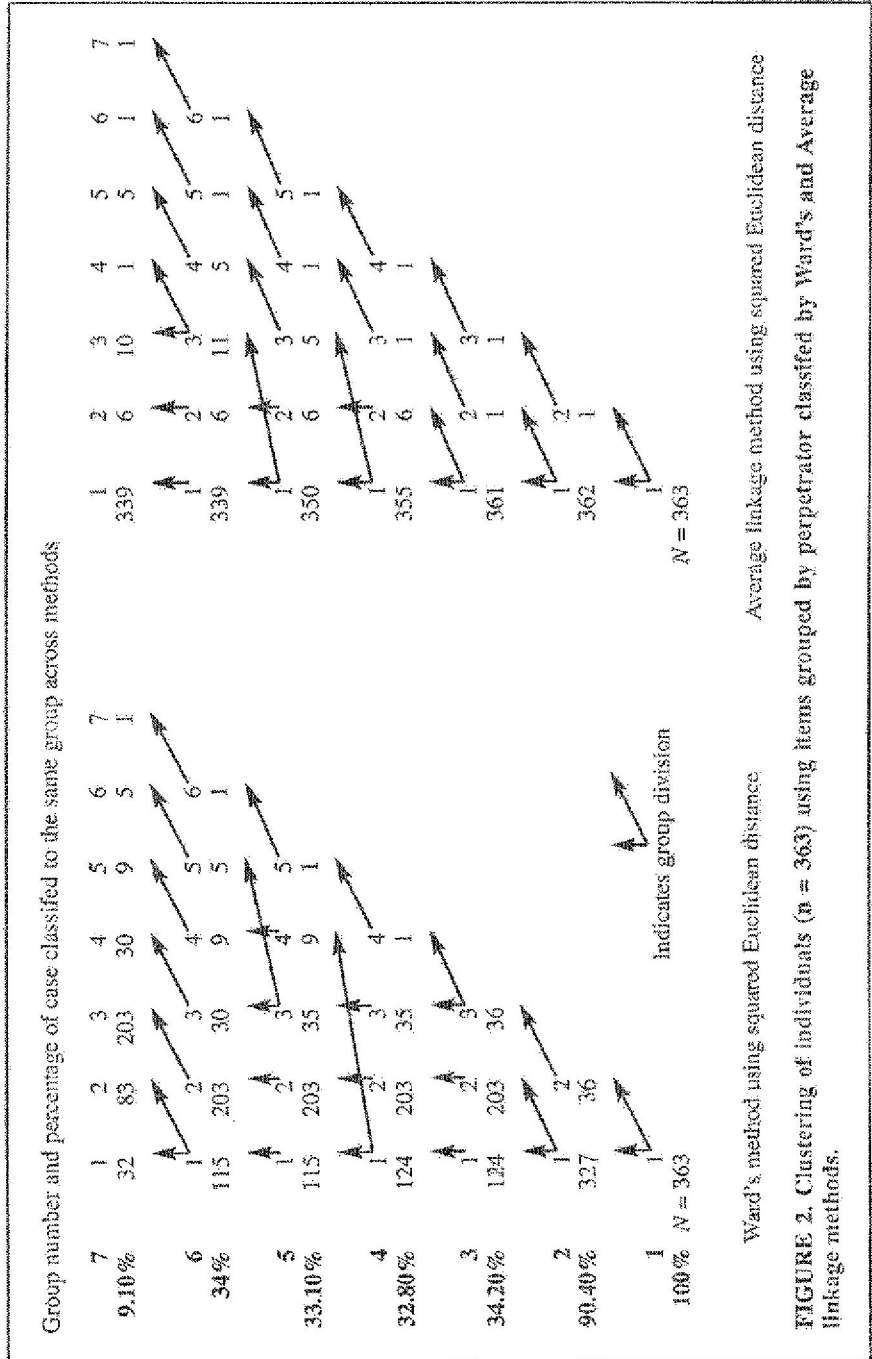
Cluster Analysis of Items Grouped by Perpetrator

I used tree diagrams to represent the groups derived from the two- through seven-cluster solutions using Ward's and average linkage (see Figure 2). The number of respondents allocated to each group is reported above the arrows, and the percentage of respondents allocated to the same groups across the two clustering methods is indicated in the left-hand margin. The diagram indicates that the methods differed greatly in their allocation of cases.

The dispersion of cases across clusters and the percentage of same cluster allocated cases was low, possibly because there was a relatively limited range of scores as a result of the limited number of items in each measure (e.g., witnessing family violence has only two items) and because some items (e.g., maltreatment by another adult) did not apply to some respondents. Also, all of the variables were positively skewed (most individuals suffered little or no maltreatment), with few respondents reporting very high scores. The cluster solutions of the two methods had poor stability (i.e., defined by comparing the composition of group membership for Ward's method with the composition of group membership for the average linkage method), which was due to the ineffectiveness of the average linkage method to differentiate between cases. Therefore, the final cluster solution was based on Ward's method only.

I chose the three-cluster solution as the final solution because it was parsimonious while still capturing the nature of the distinct and underlying populations represented in the data. The means for the three clusters across the 13 perpetrator measures are graphically represented in Figure 3. The means for all cluster solutions (i.e., two- through seven-cluster solutions) showed an identical pattern. Respondents were allocated to groups based on their relative level of maltreatment. The mean scores for the three-cluster group indicate that across each of the 13 measures, Cluster 2 had lower maltreatment scores than Cluster 1, which in turn had lower maltreatment scores than Cluster 3. Therefore, Cluster 1 represents respondents who experienced moderate levels of maltreatment (124); Cluster 2 represents those who experienced low levels of maltreatment (203); and Cluster 3 represents those with high levels of maltreatment (36).

I discarded the two-cluster solution, as the presence of a discrete third group



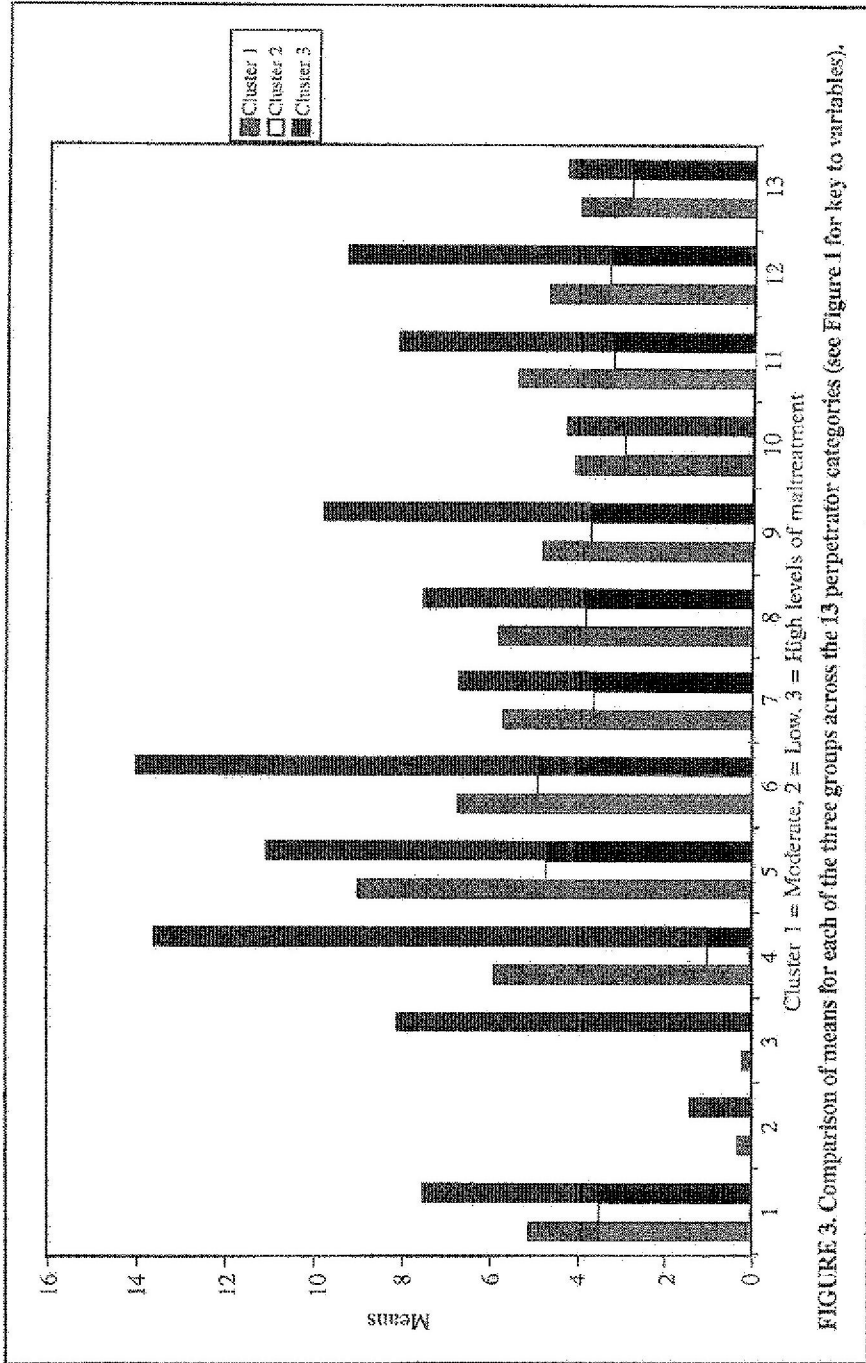


FIGURE 3. Comparison of means for each of the three groups across the 13 perpetrator categories (see Figure 1 for key to variables).

was lost. The four-cluster solution added little information as it contained only one case that was differentiated from the third cluster (i.e., it represented an outlying case of high maltreatment). The five-, six- and seven-cluster solutions followed the same pattern captured in the parsimonious three-cluster solution, and they too were discarded as they added little additional information. A replication of the solution using randomly selected subsamples from the original sample validated the choice of the three-cluster solution. Ward's method produced almost identical cluster profiles when applied to the parent sample and the two randomly generated subsamples.

I performed a discriminant function analysis to further validate the three-cluster solution by examining the accuracy of the 13 perpetrator variables in discriminating between the three clusters. The analysis extracted two discriminant functions, both of which reliably discriminated between low, moderate, and high maltreatment clusters. The first function discriminated best between Clusters 2 and 3 (low and high maltreatment clusters, respectively): $\chi^2(16, N = 363) = 586.8, p < .001$. The second function discriminated best between Cluster 1 (moderate) and the other two clusters: $\chi^2(7, N = 363) = 82.2, p < .001$. Wilks's lambda indicated that fathers' neglect (.55), then mothers' psychological abuse (.36), discriminated best between the three clusters, with Cluster 2 (low maltreatment) scoring the lowest on these variables, followed by Cluster 1 (moderate maltreatment); Cluster 3 (high maltreatment) scored the highest.

The discriminant function analysis correctly classified 86% of maltreatment cases to the three clusters generated by Ward's method. Table 1 shows the classification accuracy of the discriminant functions for each group in the three-cluster solution. This high percentage of correctly classified cases supports the selection of the three-cluster solution. Of the 124 moderate maltreatment cases, 86 were correctly classified; of the 203 low maltreatment cases, 195 were correctly classified; and of the 36 high maltreatment cases, 31 were correctly classified. The greatest

TABLE 1. Classification Results for Discriminant Function Analysis of Clustering Based on Items Grouped by Perpetrator

Group	Predicted		
	Group 1: Moderate	Group 2: Low	Group 3: High
1 (Moderate); <i>n</i> = 124	86 (70%)	35 (28%)	3 (2%)
2 (Low); <i>n</i> = 203	8 (4%)	195 (96%)	0 (0%)
3 (High); <i>n</i> = 36	5 (14%)	0 (0%)	31 (86%)

Note. The figures in bold represent cases correctly classified.

number of misclassifications was for the moderate abuse group, of which 28% were wrongly classified into the low abuse group. A map of the group centroids for the canonical discriminant functions shows that there is considerable overlap between cases in the low maltreatment group and those in the moderate maltreatment group. This accounts for why these cases were most likely to be misclassified.

Planned Comparisons of Outcome Data for Each Cluster in the Analysis of Items, Grouped by Perpetrator

I calculated one-way analysis of variance (ANOVA) and *t* tests (pair-wise comparisons) to determine whether cases allocated to low, moderate, and high maltreatment groups differed in terms of their scores on measures of psychological adjustment. Although the cluster analysis was performed on a database that combined the parent report and adult report datasets, for the planned comparisons, the CCMS-A ($n = 313$) and CCMS-P ($n = 50$) cases were analyzed separately, as different adjustment measures were used in each data set. In the parent report dataset, I used the Child Behavior Checklist (internalizing and externalizing behavior problems), Child Sexual Behavior Inventory, and a single-item measure each of self-derogation and gender identity. In the adult self-report datasets, I used Rosenberg's Self-Esteem Scale and the TSC-40.

Parent report data. The group sizes in the parent report dataset were disproportionate: 43 cases in the low, 6 cases in the moderate, and only 1 case in the high maltreatment cluster. Therefore, only descriptive statistics are reported for the five adjustment measures, which are presented in Table 2. No meaningful comparison can be made with the high abuse group as it contained only one case. A comparison of the other two groups showed that according to parent reports, children in the moderate abuse group had higher levels of externalizing, internalizing, and sexual behavior problems than those in the low abuse group.

Adult retrospective self-report data. In the adult retrospective self-report dataset, there were 160 in the low, 118 in the moderate, and 35 in the high abuse group. The means and standard deviations for each group are contained in Table 3. High scores on the TSC-40 indicate greater trauma symptomatology, and high scores on Rosenberg's scale indicate greater self-derogation. There was a significant difference among the three groups in trauma symptomatology, $F(2, 310) = 26.6$, $p < .001$. Pairwise comparisons revealed that both moderate and high abuse cases reported significantly greater trauma symptoms than low abuse cases ($p < .001$). No significant difference was found between moderate and high abuse cases. There was also a significant difference among the three groups on self-esteem, $F(2, 310) = 46.3$, $p < .001$. Pairwise comparisons revealed that each cluster differed significantly from the other clusters in self-esteem ($p < .001$), with greater levels of maltreatment associated with poorer self-esteem.

TABLE 2. Means and Standard Deviations for Low, Moderate, and Highly Abused Members in the Adult Retrospective Parent Report Dataset

Measure/Group	<i>M</i>	<i>SD</i>
Child Behavior Checklist-Internalizing behavior problems		
Low	6.9	6.2
Moderate	13.3	7.6
High	17.0	0.0
Child Behavior Checklist-Externalizing behavior problems		
Low	8.4	8.2
Moderate	12.8	12.8
High	8.0	0.0
Child Sexual Behavior Inventory		
Low	10.1	9.3
Moderate	14.1	9.5
High	12.0	0.0
Self-derogation		
Low	2.1	1.1
Moderate	2.2	1.0
High	2.0	0.0
Gender identity		
Low	1.3	0.6
Moderate	1.5	0.8
High	2.0	0.0

TABLE 3. Means and Standard Deviations for Low, Moderate, and Highly Abused Members in the Adult Retrospective Self-Report Dataset by Perpetrator

Measure/Group	<i>M</i>	<i>SD</i>
Trauma Symptom Checklist-40		
Low	21.5	11.2
Moderate	31.4	15.1
High	35.7	17.1
Rosenberg's Self-Esteem Scale		
Low	22.8	11.2
Moderate	30.3	14.1
High	46.6	20.1

Cluster Analysis of Items Grouped by Behavior

The initial cluster analysis performed on the items summed by perpetrator (13 items) was then repeated using the items summed by behavior type (21 items). The tree diagrams in Figure 4 represent the groups derived from the two-through seven-cluster solutions using Ward's and average linkage methods. Like the perpetrator cluster solutions, this diagram indicates that the methods differed greatly in their allocation of cases. The cluster solutions of the two methods again had poor stability because of the average linkage method's ineffectiveness in differentiating between cases. Again, the final cluster solution was based on Ward's method, although the average linkage method did differentiate more cases in this analysis than in the perpetrator analysis, probably because there was a greater range of scores with 21 rather than 13 variables.

I chose the three-cluster solution as the final solution for the behavior study for the same reasons as it was for the perpetrator study: It was parsimonious while still capturing the nature of the distinct and underlying populations represented in the data. The means for the three clusters across the 21 behavior measures are graphically represented in Figure 5. The means for all cluster solutions (i.e., two- through seven-cluster solutions) were also plotted in the same way and showed an identical pattern: Members were allocated to groups based on their relative level of maltreatment. The three-cluster group means indicate that across each of the 21 variables, the low maltreatment group had lower mean maltreatment scores than the moderate group, which in turn had lower mean scores than the high abuse group.

The two-cluster solution was discarded, as the presence of a discrete third group was lost. The fourth cluster in the four-cluster solution added little information as it contained only one case that was differentiated from the third cluster (i.e., it represented an outlying case of high maltreatment). The five-, six-, and seven-cluster solutions followed the same pattern captured in the parsimonious three-cluster solution, and they too were discarded as they added little additional information.

To validate the choice of the three-cluster solution, I replicated it using randomly selected subsamples from the original sample. Ward's method produced almost identical cluster profiles when applied to the complete dataset and to the two randomly generated subsamples. I performed a discriminant function analysis to further validate the three-cluster solution by examining the accuracy of the 21 behavior variables in discriminating between the three groups. Two discriminant functions were extracted, both of which reliably discriminated between low, moderate, and high maltreatment groups. The first function discriminated best between Clusters 2 and 3 (low and high maltreatment groups, respectively), $\chi^2(28, N = 363) = 1,035.1, p < .001$. The second function best discriminated the moderate group from the other two, $\chi^2(13, N = 363) = 231.7, p < .001$.

The pooled within-group correlations for the first discriminant function indicated that sexual abuse items provided the best discrimination among the three groups, especially between high and low maltreatment groups. Low scores

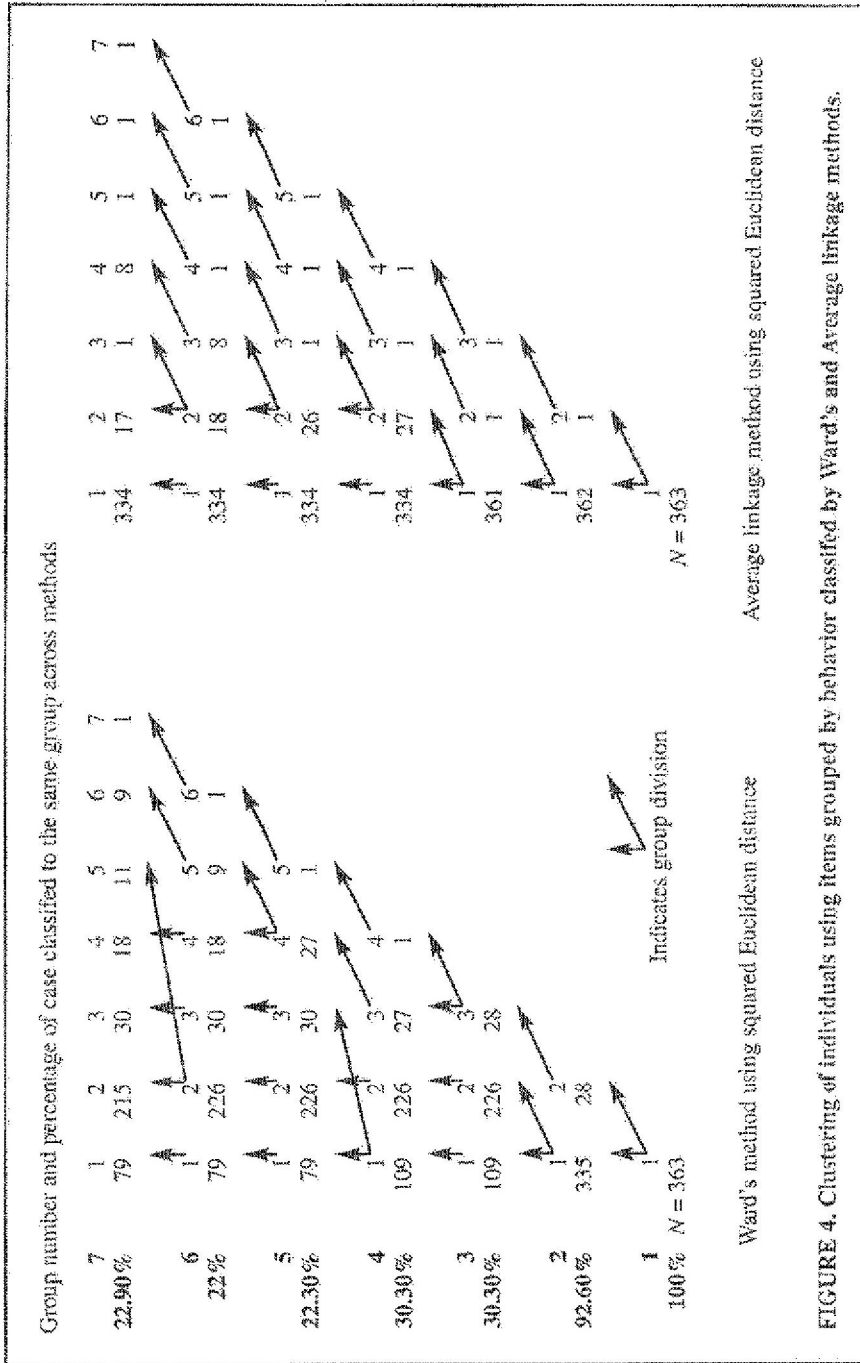


FIGURE 4. Clustering of individuals using items grouped by behavior classified by Ward's and Average linkage methods.

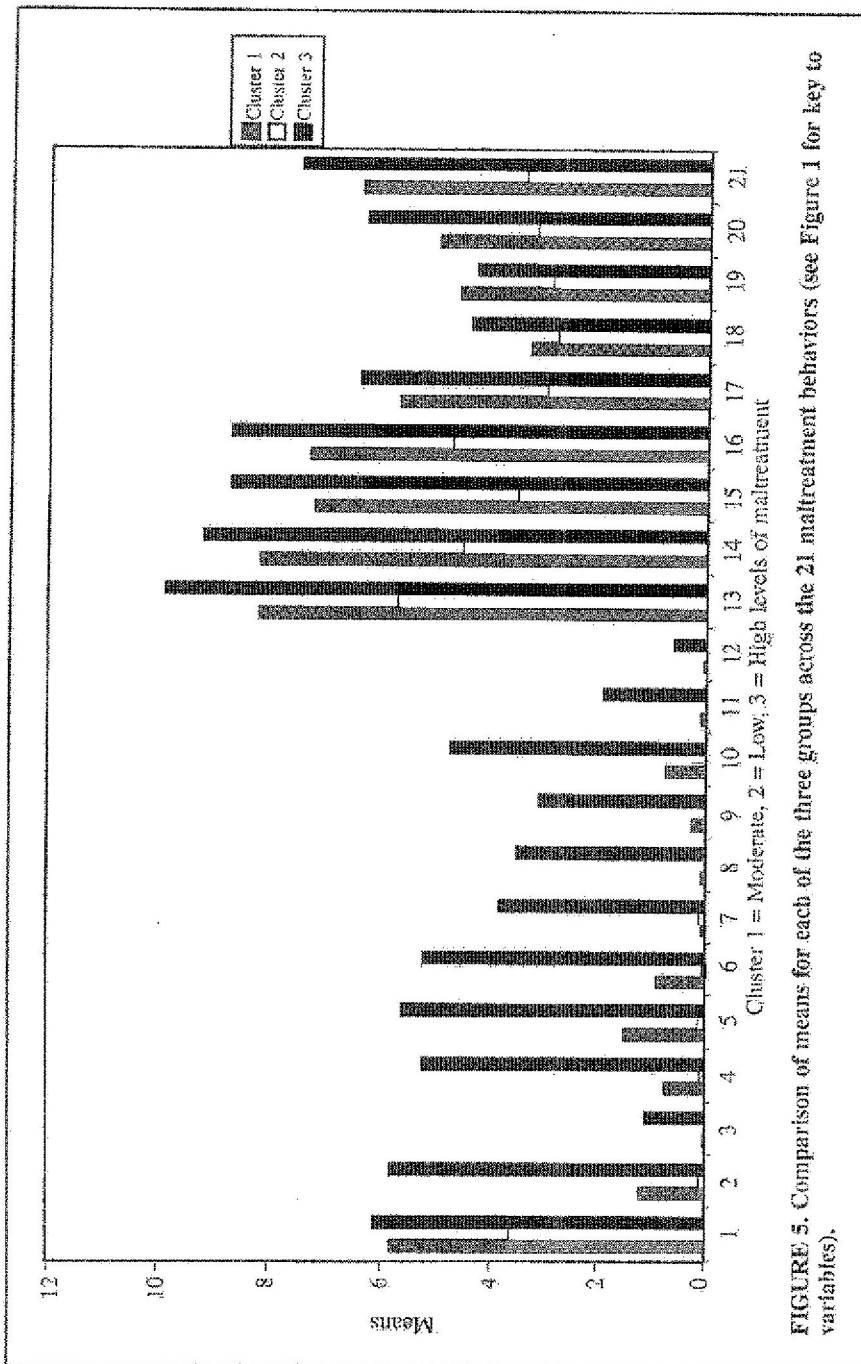


FIGURE 5. Comparison of means for each of the three groups across the 21 maltreatment behaviors (see Figure 1 for key to variables).

on many of the sexual abuse items were reported in Cluster 2 (low maltreatment); high scores were reported in Cluster 1 (moderate maltreatment), but the highest scores were reported in Cluster 3 (high maltreatment). The correlations for the second function show that psychological maltreatment (particularly *provoking* and *ridiculing*) distinguished the moderate group (who had high scores) from the other two groups. The two discriminant functions correctly classified 93.4% of maltreatment cases to the three groups generated by Ward's method. Table 4 shows the classification accuracy of the discriminant functions for each of the three cluster groups. The high percentage of correctly classified cases supports the selection of the three-cluster solution.

Of the 109 moderate maltreatment cases, 87 were correctly classified; of the 226 low maltreatment cases, all but one case was correctly classified; and of the 28 high maltreatment cases, again all but one was correctly classified. The most misclassified group was again the moderate maltreatment group, of whom 19.3% were wrongly classified as having experienced low levels of maltreatment. A map of the group centroids for the canonical discriminant functions shows that there is considerable overlap between cases in the low and moderate maltreatment groups. This accounts for why these cases were most likely to be misclassified.

Planned Comparisons of Outcome Data for Each Cluster in the Analysis of Items Grouped by Behavior

In this section, the results are given for the planned comparisons for the behavior variables, using one-way ANOVA and *t* tests (pairwise comparisons) to determine whether cases allocated to low, moderate, and high maltreatment groups differed in terms of their adjustment scores. As with the analysis based on the variables grouped by perpetrator, I analyzed CCMS-A and CCMS-P cases separately, as different adjustment measures were used in each.

TABLE 4. Classification Results for Discriminant Function Analysis of Clustering Based on Items Grouped by Behavior

Group	Predicted		
	Group 1: Moderate	Group 2: Low	Group 3: High
1 (Moderate)	86 (79.8%)	21 (19.3%)	1 (0.9%)
2 (Low)	1 (0.4%)	225 (99.6%)	0 (0%)
3 (High)	1 (3.6%)	0 (0%)	27 (96.4%)

Note. The figures in bold represent cases correctly classified.

Parent report data. The group sizes in the parent report dataset were disproportionate: There were 47 cases in the low maltreatment group, 1 case in the moderate, and 2 in the high. Therefore, only descriptive statistics are reported for the five adjustment measures. The high maltreatment group reported higher levels of sexual behavior problems, self-derogation, gender identity disturbance, and internalizing behavior problems than those in the low or moderate maltreatment groups. However, the high maltreatment group had fewer externalizing behavior problems than the other two groups. This result should still be treated with caution, as there were only two cases classified into the high abuse group, and the magnitude of the standard deviations for the low abuse group was much higher than standard deviations for the high abuse group on most of the variables, indicating the diversity of responses within—as well as between—groups.

Adult retrospective self-report data. The adult self-report dataset contained sufficient variability between groups and adequate group sizes to conduct one-way ANOVA and *t* tests. There were 179 low maltreatment cases, 108 moderate abuse cases, and 26 high abuse cases. The means and standard deviations for each group are given in Table 5. There was a statistically significant difference among the three groups in trauma symptomatology, $F(2, 310) = 28.8, p < .001$. Pairwise comparisons revealed that each cluster differed significantly from the other clusters ($p < .001$). Higher levels of maltreatment were associated with reports of more trauma symptoms. There was also a statistically significant difference among the three groups in self-esteem, $F(2, 310) = 28.0, p < .001$. Pairwise comparisons revealed that individuals in the low maltreatment group reported significantly higher self-esteem than those in either the moderate or high maltreatment groups. There was no significant difference in self-esteem for moderate and high maltreatment groups.

TABLE 5. Means and Standard Deviations for Low, Moderate, and Highly Abused Members in the Adult Retrospective Self-Report Dataset by Behavior

Measure/Group	<i>M</i>	<i>SD</i>
Trauma Symptom Checklist-40		
Low	22.4	12.2
Moderate	30.5	12.8
High	41.5	22.3
Rosenberg's Self-Esteem Scale		
Low	23.1	11
Moderate	34.6	17.6
High	37.7	18.2

Discussion

I conducted cluster analysis of three different datasets on five different types of child abuse and neglect—including both adult retrospective self-report and parent report data—to see whether cases clustered according to the a priori categories currently used by researchers and practitioners. I then conducted planned comparisons to see whether the clustering solutions were meaningful in differentiating between levels of psychological adjustment.

Rather than clustering according to traditional maltreatment types, the various maltreatment items were fairly evenly spread across the three clusters. The best fit cluster solutions for both the retrospective adult self-report data sets and the parent report data set differentiated individuals not in terms of a priori categories (sexual abuse, physical abuse, psychological maltreatment, neglect, and witnessing family violence) but in terms of the extent of the reports of their maltreatment experiences regardless of type.

Although it is convenient for researchers—and child protection workers—to speak of different types of maltreatment, what is evident from these analyses is that it may be more meaningful to talk about the *degree* of negative parent or adult behavior that is reported (i.e., high, medium, or low frequency and the severity of maltreatment) rather than about the *type* (e.g., sexual, physical). There were only three groupings reflected in the cluster analysis—high, medium, and low levels of maltreatment—and the planned comparisons particularly supported the distinction between low and high maltreatment clusters. The particular type of harm was not differentiated. The lack of differentiation between a priori maltreatment types supports researchers' recent focus on multitype maltreatment and the negative consequences of experiencing more than one type of maltreatment (Higgins & McCabe, 2000a, 2001b, 2003).

Limitations

The controversial findings reported here need to be treated with caution. Until other researchers conduct similar analyses to support (or challenge) the findings, the conclusions should be seen as indicative of a potential trend in maltreatment data. There are a number of problems with the analyses reported here, including the relatively low stability of the cluster solutions and the difficulty of generalizing because of the self-selected nature of the sampling in each of the datasets. There also may have been a response bias toward multiproblem respondents, and therefore the findings may only generalize to multiple-trauma individuals.

Problems inherent in the use of secondary data should also be considered. Other variables of interest that were not collected may be important in explaining the relationships between the variables, such as the nature of the attachment relationship between the child and parent or authority figures and factors surrounding their disclosure of maltreatment (e.g., reaction of parent or authority figure).

Alternate explanations for the findings need to be considered. The results of the analyses suggesting that it is not maltreatment type per se but extent of maltreatment that is important in predicting adjustment need to be considered in the context that information about the maltreatment experiences were measured using a cumulative scale, and adding scores together within subscales may have inflated respondents' scores. Therefore the particular findings may be an artifact of measurement.

In addition, the maltreatment data were not externally referenced, relying instead on a single report from a single informant (although data have already been published to show that test-retest reliability of the CCMS-A and CCMS-P are adequate). Also, the fact that identical cluster solutions emerged for both the parent report and the adult self-report datasets suggests that it is unlikely to be an artifact of the particular dataset.

Although there was low stability for the cluster solution (i.e., only 34.2% were classified into the same cluster in the two different methods), neither method grouped respondents according to designated a priori maltreatment types, such as sexual abuse or physical abuse. Instead, both methods of clustering pointed toward maltreatment being a unidimensional construct, with potential differentiation based on the *extent* of the behaviors reported, not on the *type* per se. Also, the validation process of comparing the psychological adjustment of the cluster groupings supported the conclusions of this study: (a) that maltreatment is best grouped according to the degree to which it is experienced (frequency, duration, and severity); and (b) that the greater the degree of maltreatment, the greater the level of psychological maladjustment.

Conclusions and Implications

Researchers need a new model of maltreatment types and a comprehensive theory of the causes and consequences of child maltreatment that reflect the likelihood that there are not discrete maltreatment types but only different maltreatment groupings based on the severity of perpetrator behaviors. What should a new theory offer? It should be falsifiable, comprehensive, and parsimonious. How would it benefit the current state of the research? It should offer predictions, and account for existing research data. How could it help practitioners involved in prevention or intervention? It should give practitioners an integrated perspective for understanding the multiple causes of clients' problems and provide a theoretical basis for the provision of family support, multidimensional approaches to prevention of child maltreatment, and other efforts to foster community mental health.

One additional suggestion derived from the analyses presented here is that therapists working with individuals who report a childhood history of abuse should focus more on exploring with their clients the extent of various kinds of abusive and neglectful experiences and the relationship between these and their current symptomatology rather than focusing on categorizing their clients as victims of a particular maltreatment.

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