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THE UNIVERSITY OF ALBERTA

CHILD PROTECTION PRACTICE: A QUANTITATIVE STUDY

By

Heather E. Rennebohm

A Thesis

Submitted to the Faculty of Graduate Studies and Research in partial fulfilment of the requirements for the degree of Master of Health Services Administration

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled Child Protection Practices: A Quantitative Study submitted by Heather E. Rennebohm in partial fulfilment of the requirements for the degree of Master of Health Services Administration.

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ABSTRACT

In the field of child abuse and neglect there is a need for clear, useful definitions for the types of child maltreatment such that cases can be accurately classified, child protection services can be provided in a systematic manner, and the effect of new programs can be determined across case types. This exploratory study of current child protection practices addressed that need through these objectives; to develop a child maltreatment case typology and a child protection services typology; to determine if a systematic relationship existed between the derived case types and service provision sets in a current practice setting for both typical and more problematic cases (the latter being those not only assessed by the child protection worker but also assessed by a Multidisciplinary Child Abuse and Neglect Consultation Team).

Data concerning risks to a child at investigation and services provided were collected from a random sample of general child protection cases and from cases seen by the Multidisciplinary Team. Application of cluster analysis to the risks data resulted in four case types: two of which were commissive in nature, one omissive, and one reflective of a disadvantaged situation. A similar cluster analysis of service data resulted in three service types: two having to do with modifying the child's environment, one with modifying the child's environment plus his or her behavior. Though a statistically significant case type to service provision match was not uncovered, an interpretable service provision pattern did emerge.

The Multidisciplinary Team cases were classified according to the derived case typology and these more problematic cases appeared to belong to the two commissive categories. The corresponding Team service data was classified according to the derived service typolgy. Significant evidence of the case type to service provision relationship was not uncovered but, again, an interpretable pattern emerged. Further, the Team cases did receive systematically different services in comparison to similar non-Team cases.

Given the limitations of this study the recommendation was made that routine documentation of assessment and treatment decisions on child protection files be maintained and utilized in further research in this domain which should include outcome studies.

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CHAPTER ONE

INTRODUCTION

Statement and Importance of the Problem

There is a growing realization at all levels of North American society that child abuse and neglect is a serious problem and that effective programs for identification and treatment must be implemented (Herbert & Hendrix, 1977). Over the past decade, as the extent and severity of child maltreatment have been publicized through the news media, public awareness and support for lessening this problem have grown. Government agencies have been given the task of developing social policies toward dealing with child abuse and neglect, yet are confounded by the substantial disagreement in many segments of society and within many professional disciplines as to what constitutes maltreatment and how best to treat that condition.

Much remains to be done in the area of developing child abuse and neglect identification and treatment programs. Many suggestions have been offered for ameliorating the severity of child abuse and neglect but insufficient data exists to show which policies or programs are the most effective in combatting these conditions. Given that government agencies are faced with limited resources for funding child protection programs, it behooves researchers to clearly define the conditions of child maltreatment such

that services can be provided, in a systematic manner, to those in need.

Given these conditions, this study of the assessment and treatment of child abuse and neglect was timely and needed. This study was conducted in two parts. The first part was concerned with the quantitative derivation of a framework which could be used for investigating relationships between case types and service provision in the general practice of child protection services. The second part of the study was concerned with using the derived framework to examine the effect of a multidisciplinary child abuse and neglect consultation team on the provision of services to child protection clients.

Part 1: Framework and Relationship

The first part of the study had two objectives. The first was to develop a systematic empirically derived description of child protection clients at initial investigation, with the intent of establishing a classification of case types that would make both clinical and scientific sense, and then to develop an empirically derived classification of the groups of services provided to those child protection cases.

The second objective was to search for statistical evidence of a relationship between the case types classification and the classification of child welfare services provided to those case types. If such a

relationship was verified it would be assumed to have been a result of the assessment to treatment plan decision making process.

This study hypothesized that child protection workers, on the basis of information collected at investigation about apparent risks to a child, cognitively placed similar cases into case type groups. It was further hypothesized that similar services would be provided to members of the same case type group and that cases in different case type groups would receive different services. In other words, there would be a relationship between the classification of case types and the classification of services delivered. That theoretical contention formed the basis of the research question addressed in the first part of the study.

Question 1:

> Does the application of appropriate statistical models to investigation and service provision data yield results consistent with the hypothesis that there are relationships between investigation and service delivery information that appear to be mediated by workers partitioning cases into case types and assigning similar services within and different services between case types?

It was, of course, not known at the outset of the study if such a relationship could be uncovered through the application of quantitative models. It was thought that, even if no relationship was found, the development of a clinically-based risk-oriented classification scheme for child maltreatment would have implications for child

protection services. Such a scheme might provide operational definitions of the various types of abuse and neglect and could aid workers in distinguishing between the types and, if determined to be valid or at least utilitarian, a classification scheme could become part of an assessment and treatment decision support system (Stein & Rzepnicki, 1984).

The research for the first part of the study was conducted in a provincial child welfare district office (D.O.) located near the center of a large western Canadian city. This D.O. contained an investigation unit and units of child protection workers. Thus, all cases used in this study were investigated and treated by staff at the same D.O..

The child abuse and neglect cases that came to this D.O. over the course of a two year period were cared for by individual child welfare workers under the mandate provided through current child welfare legislation. Those cases were considered to be examples of general child protection practices. A sample of these cases was selected for the analysis of general child protection practices. Data pertaining to investigation results and services provided were collected from the files on the selected cases. It was assumed that investigation and protection workers would document, on the file, any information which was relevant to assessment and treatment decision-making.

Part 2: Effect of Programs

The latter part of this study had one objective and that was to investigate the effect of a multidisciplinary team on child protection practices. This was done by applying the framework derived in Part 1 to the child protection cases that had been reviewed and assessed by a multidisciplinary team (Team sample).

A Multidisciplinary Child Abuse and Neglect Consultation Team had been established in October of 1983 at the D.O. described on p. 4. The Team was still serving the child protection workers of that D.O. in October of 1985 when this study began. The team was jointly sponsored by the provincial government and a community committee. The goals of the Team were to aid workers in the provision of services to clients requiring child protection services by helping workers to identify, locate and make use of resources in the community (Nutter, Herbert & Rennebohm, 1986). The team had five process objectives:

1. To provide consultation for child welfare personnel in relation to specific cases.
2. To assist in the development of treatment plans
3. To access and coordinate appropriate treatment resources.
4. To monitor follow-up and ensure appropriate, continued intervention.
5. To review all referred cases prior to closure. (Nutter et al, 1986)

An evaluation was conducted twelve months after the Team

was started. That investigation found the Team to be achieving the first, second and last objectives (Nutter & Herbert, 1985). The investigation conducted in this study was primarily concerned with the third and fourth objectives; those referring to appropriate treatment and interventions.

The framework derived in Part 1 was also applied to another set of cases (Matched sample). Those cases were selected, from the general sample used in Part 1, on the basis of their similarity to the cases which had been the object of consultation with the Multidisciplinary Team.

The hypothesis investigated by this section of the study was that multidisciplinary child protection consultation teams facilitate more efficient service delivery than that received by child abuse and neglect cases served by a single child protection worker (Helfer & Schmitt, 1976; Mouzakitis & Goldstein, 1985). It was the contention of this study that if the teams were effecting service delivery the relationship between case types and particular service groups would be different in the two comparison samples; Team and Matched. That contention formed the basis of the second research question:

Question 2

> Do child abuse and neglect cases seen by a multidisciplinary consultation team demonstrate an empirical relationship between case type and service provision (i.e. number and type of services provided) to a different degree than similar cases

not seen by such a team?

It was thought that an investigation of relationships between case types and service delivery in Team cases versus similar general practice cases would have implications for multidisciplinary Teams. It could supply information to an evaluation of the Team's achievement of its "appropriate treatment" objectives.

Definitions

The definition of specific terms, as used in this study, are given below:

Child Abuse and Neglect - the physical or mental injury, sexual abuse or exploitation, negligent treatment or maltreatment of a child less that 18 years of age by a person who is responsible for the child's' welfare (Mouzakitis & Varghese, 1985).

Child Maltreatment - the physical or emotional abuse or neglect of children which results from actions of commission or omission of the part of parents and other individual caregivers (Alvy, 1975), is used interchangeably with "child abuse and neglect" in this study.

Child Protection Client - a child who is being cared for or provided with services or supervision under the auspices of the Alberta Child Welfare Act (1985).

Child Protection Worker - a social worker who provides services or supervision to child protection clients and their families.

Multidisciplinary Team - a group of professionals (psychologist, hospital social worker, public health nurse, pediatrician, child welfare consultant and a child welfare supervisor) available to child protection workers for consultation on cases that social workers had referred to them. The Team provided consultation on case management and planning. The Team also facilitated access to services providers outside the D.O.. It very rarely, however, provided direct treatment.

Limitations of this Study

Samples were selected from a population of child protection cases that had been opened at just one D.O.. However, there were changes in caseworker, supervisory, and D.O. management staff during the two years covered by this study. Also, some agency policy and the Child Welfare Legislation changed during this two year period. Samples were selected to fairly represent the accessible population of cases at this D.O. during these two years. The accessible population of child protection cases, however, may not be representative of child protection cases in other D.O.'s or other cities. Accordingly, the degree of external validity of the findings herein was unknown. Within the relatively small accessible population some of the pivotal

risk indicators having to do with sexual abuse and physical abuse were found infrequently and those low frequencies may have had a limiting effect upon the results of the study. The data collection tool presented another limitation to this study in that the list of Initial Risk Indicators that made up the first section of the tool did not contain sufficient descriptors of the condition of the child at investigation.

Any empirically derived model is a function of the degree of validity inherent in the data available for analysis. The data used in this study were limited to what had been written on the case files. The quantity and quality of documentation was a function of worker time and habits, supervisors' requirements, and legal requirements.

Finally, many of the methods employed were heuristic in nature in that they were selected as being reasonable but did not represent a systematic exploration of all possible solutions, nor was the selection of methods based upon a single coherent statistical or mathematical framework. The employed model, cluster analysis, can limit the internal validity of research findings unless careful, comprehensive validation studies are undertaken. The cross-validation investigations undertaken in this study were not comprehensive.

Overview of Thesis

The foregoing was intended as a brief explanation of the

nature and importance of this study and the limitations of the approach employed in addressing this area of study. The next chapter will review some relevant background literature. That chapter should provide the reader with an indication of the current state of child abuse and neglect assessment and treatment knowledge, plus some pertinent information on the multivariate models used to investigate the research questions posed by this study.

The third chapter follows the pattern set above: the methodology used in Part 1 is presented and explained and then that used in Part 2 is presented and explained. Chapter Four similarily presents the results in the two major sections, while the last chapter provides a discussion of the conclusions that were derived from the results. It also includes some recommendations arising from those conclusions.

CHAPTER TWO

SELECTED LITERATURE REVIEW

This chapter has been divided into two sections. The first section presents a review of selected background information on issues and studies of, and multidisciplinary programs for, child abuse and neglect. The second section is concerned with the current knowledge of the use of the multivariate statistical models employed in this study.

Nature and Studies of Child Abuse and Neglect

Child abuse and neglect is a serious problem in North America (Gil, 1970; Kempe & Kempe, 1978; Polansky, Chalmers, Buttenweiser, & Williams, 1981; Benjamin, 1981). As reporting systems improve and awareness increases, the number of reported cases escalates (Gray & DiLeonardi, 1982). A recent American Humane Association study indicated an incidence of one million confirmed cases per year in the United States with four unreported cases probably occurring to every one confirmed (American Humane Association, 1984).

Each case of child maltreatment is, to some extent, unique in its intensity, frequency and complexity (Varghese & Mouzakitis, 1985). The complexity is a result of particular interactions between spouses, parents and their children, and between the family and social, cultural and economic conditions (Mouzakitis & Goldstein, 1985). This

complexity has hindered the development of a generalizable theory of diagnoses and treatment of child abuse and neglect (Light, 1973).

In this absence of theory, functional and widely acceptable definitions of abuse and neglect have been slow to emerge (Faller, Zeifert, & Jones, 1981). It is difficult, given the scope of societal values, to define precisely when a child has been abused and it is even more difficult to define neglect (Whiting, 1977). Definitions of some kind are necessary because social workers, in order to respond to child abuse and neglect in a competent and appropriate way, must have some method of differentiating child maltreatment from acceptable ways of dealing with children and from other problems in family functioning (Faller & Russo, 1981). Workers must have consistent operational definitions of the physical, behavioral and social characteristics of those involved in the various forms of maltreatment in order to make preliminary assessment and referrals to appropriate services (Faller et al., 1981).

Many authors have attempted to define child abuse and neglect (Kempe & Kempe, 1978; Faller et al., 1981; Polansky et al., 1981). Those definitions, however, are often specific to a particular profession, are not comprehensive, and have been difficult to operationalize (Varghese & Mouzakitis, 1985). Williams and Money (1980) saw little uniformity in the definitions of child abuse and neglect or

in the use of the terms to [illegible]te them. Another author stated that "current definitions of child abuse and neglect do not attempt to distinguish chronicity, severity or complexity." (Wolfe, 1985, p. 463). The Alberta Child Welfare Act defines a child in need of protective services as one whose survival, security, or development is endangered (Government of Alberta, 1985).

One kind of child maltreatment has proven especially difficult to define; sexual abuse. Williams and Money (1980) referred to sexual abuse as a practice lacked any operational definitions. Gil (1970) explicitly excluded sexual abuse from his definition of physical abuse, calling them two different kinds of maltreatment. Kempe and Kempe (1978) referred to sexual abuse simply as a form of exploitation. Faller et al. (1981) separated physical and sexual abuse. The legislation, under which the cases used in this study were treated, also separated physical and sexual abuse (Child Welfare Act, 1985). There are, however, several authors who have grouped the two together calling them "violation of trust", "non-accidental trauma" or simply "abuse" (Polansky et al., 1981; Kent, 1976; Giovannoni, 1971).

Another difficulty experienced by researchers has been the delineation between abuse and neglect. Abuse and neglect may be differentiated by considering abuse to be acts of commission and neglect to be acts of omission. This dichotomy is often too simplistic because in some families

several kinds of maltreatment can occur simultaneously (Faller et al., 1981).

Alvy (1975) avoided some of the above problems by creating a comprehensive definition of child abuse and neglect that includes both family and social pathology. He defined maltreatment as "the physical and emotional abuse or neglect of children which results from acts of commission and omission on the parts of parents and other individual caretakers" (Alvy, 1975, p. 36). Even though this definition circumvents some of the problems listed above, and proved useful within the confines of this study, it does not provide operational criteria for case classification or intervention decision support.

Varghese and Mouzakitis (1985, p. 8) stated that "as the various forms of maltreatment are differentiated and operational criteria for each form become more precise, the definitions can help in preventive, interventive and treatment approaches". Those authors went on to call for a more cogent and integrated framework for diagnosis. Alter (1985) pointed out that for the initial diagnostic phase of child protection, there was a need for a theoretical or clinical framework to help workers apply local legal standards and for use in creating interdisciplinary standards upon which to base sound intervention judgments.

In the early 1960's attention was drawn to the need for a decision-making framework to guide child welfare workers in making critical choices in the course of child

maltreatment assessment and treatment (Stein & Rzepnicki, 1984). DiLeonardi (1980, p. 357) declared that "there are two crucial decisions which have to be made by workers: Was this a case of abuse or neglect and, if so, was it serious enough to require services? If so, what services would be best?". Alter (1985) studied the decisions which must be made early in the development of a case and stated that they were the most difficult given the limited information at investigation and the lack of clear guidelines for governing decisions about child maltreatment. According to Austin (1981), practitioners go from information gathered about a case to the development of a treatment package. She goes on to state, however, that the limited quantitative evidence indicates that professionals' judgment in the field of child maltreatment assessment is too often inconsistent.

Current research conducted on child protection practices does not present agreement about the consistency of decision making among workers. While Craft, Epley, and Clarkson (1980) found that the individual worker's bias was the most influential decision-making factor in legal disposition of child abuse cases, Alter (1985) found a high level of agreement among workers when they were asked to decide what constituted a case of neglect. The latter author was, however, concerned about the possibility that families might be labeled abusive or neglectful in accordance with an inadequate decision-making process. Due to the lack of concrete criteria, workers have had to rely on cultural and

personal bias. That reliance on personal bias and past experience has the potential of causing failure in the purpose of protecting children on one hand and the potential of unfairly applying labels to parents on the other (Alter, 1985).

Child protection decision-making requires a framework for sorting data so that information that is relevant to a decision can be separated from that which is not pertinent (Stein & Rzepnicki, 1984). A representative case type scheme for child maltreatment would facilitate assignment of information to labeled categories on the basis of similarities between cases.

Avidson, Turner, and Noh (1986, p. 157) stated "the importance of more clearly identifying significant risk factors can hardly be overemphasized... such factors provide what basis there is for proposing possible intervention strategies." Ayoub and Jacewitz (1982) claimed it should be possible to characterize families in terms of the constellation of problems they exhibit when they present for treatment. Alter (1985) called for continued research to determine whether there is a commonly used typology and to identify its independent variables.

The complexity of child abuse and neglect cases is reflected in the number and diversity of available treatment services (Kadushin, 1980). Given the multiplicity of problems presented in child maltreatment cases, the diversity of services and the absence of a comprehensive

decision-making framework, effective treatment plans have been difficult to devise (Whiting, 1977). Hallet and Stevenson (1980) theorized that social services agencies may be better at determining that abuse has occurred than at offering the appropriate help.

Kadushin (1980) described a treatment model based on a trichotomy of service types while problem-oriented treatment systems were discussed by Schmitt, Grose, and Carroll (1976). Several authors have described field systems for providing treatment (Burt & Balyeat, 1974; Hall, DeLaCruz & Russell, 1982) and strategies for providing services within organizational realities are presented by Austin (1981). In 1984 Stein and Rzepnicki presented a treatment goal model that provided several "targets" for workers toward which all judgments and decisions could be directed (Stein & Rzepnicki, 1984).

Several authors have called for the initiation of more specific treatment programs arising from a risk oriented treatment model (Helfer, 1976; Avidson et al., 1986; Faller et al., 1981). This, they claim, would require a comprehensive perspective and the cooperation of a variety of professionals and disciplines.

Child protection workers have encountered several hurdles when attempting to deliver comprehensive services to abusive and neglectful families. The usual multiplicity of problems that these families present must be addressed by a variety of professionals across autonomous agency boundaries

(Whitworth, Lanier, Skinner, & Lund, 1981). Without an effective mechanism for communication and coordination between agencies, these professionals may duplicate their efforts or work at cross purposes (Totah & Wilson-Coker, 1985). Another hurdle is the decision-making about families involved in maltreatment. That process can be so complex and emotionally draining that "worker burn-out" becomes an issue (Byles, 1985; Schmitt, 1978).

Multidisciplinary child abuse and neglect teams have been formed as a means of overcoming those hurdles (Schmitt, 1978; Pickett & Mason, 1979; Hallet & Stevenson, 1980). Roth (1974, p. 3) described these teams as:

> a set of professionals from different disciplines, often representing different agencies, working together for well defined purposes, including coordination, diagnosis, reporting, treatment education and prevention.

Several authors have documented the workings of several kinds of multidisciplinary teams in detail (Kovitz, Dougan. Reise, & Brummitt, 1984; Totah & Wilson-Coker, 1985; Whiting, 1977).

Multidisciplinary teams are expected to provide interdisciplinary insight into complex cases and to improve interagency communications (Totah & Wilson-Coker, 1985). These teams should offer the worker an opportunity to plan an effective coordinated approach to service delivery (Whiting, 1977). Teams should also provide an avenue for sharing the difficult decisions surrounding intervention and treatment (Schmitt, 1978).

Several authors have expressed concern about the ability of multidisciplinary teams to achieve the necessary interagency coordination and communication. Some qualitative investigations of multidisciplinary teams have been conducted (Nutter & Herbert, 1985; Hochstadt & Harwicke, 1985). It has been pointed out that while there is a great deal of descriptive literature concerning multidisciplinary teams, quantitative research presenting systematic data dealing with the effect of teams on service delivery is lacking (Austin, 1981; Byles, 1985; Nutter et al., 1986).

Use of Selected Multivariate Statistical Models

Researchers have used several multivariate models to investigate assessment and treatment of child abuse and neglect. Kent, Weisberg, Lamar, and Marx (1983) used cluster analysis to create a typology of child abuse cases. Several researchers have used other multivariate models for deriving case typologies. Ayoub and Jacewitz (1982) and Craft et al. (1980) used factor analysis to investigate risks of poor parenting and influences in legal dispositions in child abuse, respectively. Daley and Piliavin (1982) used multiple regression analysis to identify significant variables in the classification of child abuse.

Cattell (1965, p. 432) has pointed out that "if one is interested only in classifying variables in groups according to their degree of resemblance .....correlation cluster

search methods without factor analysis, suffice". Kent et. al. (1983) decided against the use of factor analysis because they thought that while grouping variables that covaried would be economical, the model often results in factors that are difficult to interpret and important relationships can be obscured.

Aldenderfer and Blashfield (1984) describe the cluster cluster analysis method as a fundamentally simple heuristic "rule of thumb", a plausible algorithm that can be used to create clusters of cases. They recommended careful consideration of 5 steps to all cluster analysis studies:

1) selection of the sample to be clustered,
2) definition of the set of variables on which to measure the cases,
3) computation of similarities among the cases,
4) choice of a cluster analysis method to create groups of similar cases, and
5) validation of the resulting cluster solution (Aldenderfer & Blashfield, 1984).

Many methods are available for computing similarities and creating clusters (Blashfield & Aldenderfer, 1978). It is vital to the accuracy of cluster solutions that the methods chosen be appropriate to the data and the purpose of the analysis (Lorr, 1983). The squared Euclidean method of computing similarities (described by Everitt, 1980) has been widely used in the social sciences (Lorr, 1983). Aldenderfer and Blashfield (1984) have listed the advantages of this method, one of which is that it meets the metric criteria.

This method represents cases as points in a coordinate space such that observed similarities and dissimilarities correspond to metric distances between cases. Everitt (1980) points out some of the problems with the use of the squared Euclidean distance measure, most of which occur in studies where the independent variables are measured on widely different scales and must be standardized.

Hierarchial agglomeration is the most prevalent clustering method in the social sciences (Blashfield & Aldenderfer, 1978). The Ward method of selecting cases to form clusters groups those cases or sets of cases, the combination of which results in the minimum increase in the within groups sum of squares or the error sum of squares for the newly formed cluster (Ward, 1963). The Ward method tends to create clusters of relatively equal sizes and shapes. Any rare cases or outliers in the data set, or conversely, groups which display a great deal of cluster overlap, are given the best coverage and separation with this method (Ward, 1963). However, if the clusters are of unequal sizes and shapes in the metric space this method may be inappropriate (Aldenderfer & Blashfield, 1984). If the aspects of good coverage and separation were of primary importance to a study, the Ward method should be chosen as the most appropriate clustering method.

An important point in the use of the cluster analysis model involves deciding at which step the clustering should be terminated. Everitt (1980) states that while this is a

critical point in the analysis, it is among the, as yet, unsolved problems in the use of this model. Aldenderfer and Blashfield (1984) recommend two approaches to determining the appropriate number of clusters in the final solution for social scientists: formal tests and heuristic procedures.

In terms of the formal tests for determining the optimal number of clusters an examination of the squared Euclidean distances at each step of the analysis is undertaken. An unexpectedly large jump in distances from one step to the next usually indicates that two very dissimilar clusters have been merged. Thus, the number of clusters prior to that merger is often regarded as an appropriate solution (Everitt, 1980).

One heuristic procedure is the qualitative examination of the variables represented in those cases making up the clusters. When the variables represented in the cases making up each cluster seem to describe a similar condition, for each cluster, the cluster solution may be deemed appropriate (Kent et al., 1983).

Discriminant function analysis has been used in classification studies in related fields (Bay, Overton, Harrison, Stinson, & Hazlett, 1979). Klecka (1980) describes discriminant analysis as a statistical tool which allows the researcher to study the differences between two or more groups of objects with respect to several variables and to subsequently classify additional objects which have been measured on the same variables.

Klecka (1980) goes into detailed descriptions of the prerequisites, uses and mathematics of discriminant function analysis.

The prerequisites for the use of discriminant function analysis are as follows:

1) 2 or more discrete classification groups must exist and they must differ on several variables,
2) those variables must be measured on an interval or ratio scale,
3) no variable may be a direct linear combination of another variable,
4) the covariance matrices for each group must be equal, and
5) the groups must be drawn from a population with a multivariate normal distribution on the variables.

Discriminant function analysis can also be of use in verifying that theoritical classification groups do, indeed, differ on several variables and are, in fact, discreet. If the nature of the classification groups is unknown, attempting to use the model to prove the usefulness of the classification groups is inappropriate. However, it is acceptable, in that case, to use discriminant function analysis to learn more about the nature of the groups (Klecka, 1980).

Summary

The literature reviewed has indicated a need for studies that would supply the elements of sound decision support systems for child abuse and neglect assessment and treatment. Several authors also voiced a concern regarding the efficacy of multidisciplinary teams and, thus, raised

the issue of further quantitative investigations of these teams.

The latter section of this review covered the uses, strengths, and limitations of some pertinent multivariate models: two of which (cluster analysis and discriminant function analysis) were used in this study. The next chapter illustrates how this study employed these models in an attempt to address the aforementioned needs.

CHAPTER THREE

METHODS

The Data Collection Tool

The data collection tool that was used for this research was assembled and checked for validity and reliability in a previous study (Nutter et al., 1986). The tool consisted of two lists of specific criteria that could be used to differentiate child protection cases. One list consisted of negative client conditions or case events called initial risk indicators. The other identified specific services that could be provided to clients.

Initial risk indicators were descriptors of a child's condition(s) or environment at investigation that, in combination, warranted intervention. The descriptors included statements about the condition of the care-giver (C.G.), the child, and the child's environment. All initial risk indicators used in the final version of the tool and other authors who have studied these indicators are listed in Table 1.

The list of initial risk indicators resembled a checklist of problems devised by Ayoub and Jacewitz (1982) who had attempted to describe the "internal and external obstacles to adequate family functions". The list was also similar to the initial investigation decision-making

Table 1

Initial Risk Indicators and Corroborating Authors

Initial Risk Indicators	Authors
sexual abuse/perp. still in home	
C.G. admits abuse/ will continue	Giovannoni, 1971
prior reports of abuse	Morse et al., 1970
child threatens suicide	Rosen, 1981
C.G. refuses entry/access	Polansky et al., 1981
C.G. refuses support services	Kent et al., 1983
Child afraid to go home	Avison et al., 1986
Child refuses to go home	Avison et al., 1986
Bizarre punishment	Kent, 1976
Age-inappropriate punishment	Kent, 1976
Injury inconsistent explanation	Koel, 1969
Bruises under 1 year	Rosen, 1981
Fracture under two years	Rosen, 1981
Major injury under three years	Rosen, 1981
C.G. threatens to kill/harm child	Polansky et al., 1981
Medical evidence of prior abuse	Morse et al., 1970
Child witness family violence	Avison et al., 1986
Untreated illness/injury child	Polansky et al., 1981
Unsafe environment	Wedge & Prosser, 1973
CG displays psychotic behavior	Daley & Piliavian, 1982
CG inebriated/risk to child	Swanson et al., 1972
CG fails recognize childs'needs	Daley & Piliavian, 1982

(cont.'d)

Table 1 (cont.)

Initial Risk Indicators	Authors
Child left unsupervised inapprop.	Avidson et al., 1986
Child left caring for siblings	Avidson et al., 1986
C.G. refuses responsibility	Polansky et al., 1981
No food in the home	Polansky et al., 1981
Child intoxicated	Swanson et al., 1972
Child at school with no lunch	Polansky et al., 1981
Child walks long dist. to school	Polansky et al., 1981
Child often asleep at school	Polansky et al., 1981
Child often tardy at school	Polansky et al., 1981
Child often truant	Polansky et al., 1981
Child inappropriately dressed	Polansky et al., 1981
Failure to thrive	Koel, 1969
Prior reports of neglect	Morse et al., 1970
Cultural problems in family	Daley & Piliavin, 1982
Alcohol or drug abuse/CG	Swanson et al., 1972
Alcohol or drug abuse/child	Swanson et al., 1972
Battered wife	
Ill or handicapped child	Daley & Piliavin, 1982
C.G. mental/physical illness	Kent et al., 1983
Single parent	Wedge & Prosser, 1973
C.G. poverty/social assistance	Herrenkohl et al., 1984
Child prostituting	
Child self-mutilating	Rosen, 1981

(cont.'d)

Table 1 (cont.'d)

Initial Risk Indicator	Author
Adolescent adjustment problems	
Criminal activity of CG	Alter, 1985
Other	

Note: this list of Initial Risk Indicators was originally compiled by Nutter et al., 1986.

questionnaire devised by Stein and Rzepnicki (1984).

The second list contained the services that could be provided to a child protection case within the time and place of this study. The list of identified services is given in Table 2.

During the data collection, an initial risk indicator was coded as "present" if the research assistants found a description of that risk documented on the initial investigation report. The assumption was made that child welfare workers would document pertinent, decision-making data and that they would not document risks that were not used for subsequent decisions. A service was coded as "provided" if the research assistants found evidence on the file that the client had actually attended or received the service.

Sample and Sample Sizes

The accessible population was the approximately nine hundred child protection cases that were opened at the D.O. described in Chapter 1 from October, 1983 through October, 1985. Three samples were drawn from that population; Random, Team and Matched (Nutter et al., 1986).

For the Random sample, an alphabetized computer listing of the population of cases was obtained. The Random sample was drawn from that list by randomly selecting one case from each sequential group of ten cases, resulting in a sample comprising approximately ten per cent of the

Table 2

Services Included in Data Collection Tool

Service or Intervention
Foster Home
Group Home
Institutional placement
Independent living program
Adoption
Supervision order
Temporary guardianship order
Permanent guardianship
Secure treatment order
Support agreement
Custody agreement
Home-maker services
Family aide services
Parenting course for C.G.
Marital counselling for C.G.
Psychological assessment
Family Therapy
Individual counselling or therapy
Psychiatric Assessment
Psychiatric treatment
Medical examination or treatment
Dental examination or treatment

(cont.'d)

Table 2 (cont.)

Service or Intervention
Worker monitors home situation
Worker requires assistance in entering home
Assessment of school situation
Culturally specific support
Food, clothing and shelter
Addiction Counselling
Emergency accomodation
Day Care
Emergency child care
Youth Support
Recreational activities
Multidisciplinary team consultation
Individual counselling for sexual abuse
Group counselling for sexual abuse
Other

Note: this list of Services was originally compiled by NUtter et al., 1986.

population (n=89).

The second sample included all the cases reviewed by the Multidisciplinary Team between October, 1983 and October, 1985.

The Team was consulted on sixty-two cases (involving forty-one families) during the two years. Siblings in this group were later found to be almost identical with respect to the presence of initial risk indicators, resulting in family groupings rather than commonalities of needs across clients in different families. Thus it was decided to use only one sibling case from each family. The method of choosing the single case from each family varied. If all multiple sibling files had the same information, one sibling was selected at random. If one case from the set had more information, that case was selected. Usually the most detailed information was placed on the youngest sibling's file. The resulting forty-one Team cases represented 4.8 per cent of the total population.

The third sample was chosen such that each case in this Matched sample was similar to one of the cases in the single sibling Team sample. The matching criteria were the reasons for opening the case and the time of case opening (Nutter, et al., 1986). For one team case a match could not be found. It is important to note that 36 of the 40 Matched cases were drawn from within the Random sample. The other 4 Matched cases were selected from the population for their similarity to the remaining Team cases. Therefore, the

Matched and the Random samples were not independent; the former being largely a subset of the latter. When multivariate analyses were performed on the Random sample, 36 of the Matched cases would be included in those analyses and 4 Matched cases would not. The samples and their sizes are listed in Table 3.

Part 1

Derivation of Case Types from General Practice

Although the 48 initial risk indicators were simply coded as "present" or "absent", each indicator theoretically represented an underlying continuum. The presence of an indicator on the initial investigation form represented a threshold decision along the continuum from not present at all to very obviously present. These 48 variables were, therefore, considered suitable for interval level multivariate analysis (Green, 1978).

Initially, Q-type factor analysis (Lorr, 1983) was employed in an attempt to group cases according to their similarities of initial risk indicators. However, because the initial risk indicators correlation matrix proved unsuitable for factor analysis, the use of that model had to be abandoned. Cluster analysis was the next model chosen for the multivariate analysis of the initial risk indicators.

The sample used for the cluster analysis in this section

Table 3

Samples and Sample Sizes

Sample Label	Number of Cases
Random Sample	89
Team Cases (all)	62
Team Cases (single sibling)	41
Matched	40 (36 Random + 4)

of the study was the Random sample because the case type scheme was to be derived from general practice. The cases were clustered across the 48 initial risk indicators. These variables were chosen because the desired case types were to be based on the condition of the client at investigation.

The squared Euclidean measure was used to calculate the distance between cases. In this study it is reasonable to assume that all initial risk indicators were measured on the same scale. There exist no data to test this assumption and no data to support alternate scalings of these data. Therefore, problems associated with different scales for relevant risk indicators were not seen as relevant to this study. Wards' method and heirarchial agglomeration were used to form clusters.

In order to decide when to stop the clustering, the squared Euclidean distances were examined at each step of the analysis. If that examination yielded a possible cluster solution the following heuristic approach was also taken. The initial risk indicators represented in the cases found within each cluster were listed and called risk indicator profiles. When the initial risk indicators in a profile seemed to describe a similar client condition, for each cluster, the cluster solution was deemed appropriate.

The above methods for determining the "true" number of clusters is not grounded in statistical theory. Therefore, the validation of the cluster solution was considered critical. Several levels of validation were conducted; a)

replication with internal cases, b) verification with external variables and c) cross validation with external cases. External variable validation was regarded as more powerful, since that approach directly tested the generality of cluster solution against relevant criteria (Aldenderfer & Blashfield, 1984).

Replication with internal cases was carried out as suggested by Goldstein and Linden (1969). Forty-six (approximately 50%) of the Random sample cases were randomly selected. Following that, the cluster analysis described above was carried out again using just those 46 cases. The risk indicator profiles for the sub-sample clusters were drawn up and reviewed for similarity to the full sample profiles. If the cluster solution was not simply an artifact of the 89 Random sample cases, the profiles found in the sub-sample would resemble those found in the full Random sample. A cross-tabulation was carried out to see if cases which had fallen into a particular cluster in the full sample solution would fall into that same type of cluster in the sub-sample solution. The significance of the chi-square statistic was calculated. In order to verify the original cluster solution using external variables, relevant variables which had not been used in the case type clustering had to be chosen. It was thought that the various court orders might be associated with case type. Therefore, a cross-tabulation of case type by type of court order was carried out.

The Team sample was used to cross validate the case type scheme with a set of external cases. It was not deemed appropriate to apply the cluster analysis to the Team sample to see if a similar cluster solution resulted. The Team sample, by virtue of the terms of reference of the Multidisciplinary Team, should have contained more complex, demanding or urgent cases than the Random sample. It was thought, however, that the original cluster solution could be tested by attempting to classify the Team cases into the original case types. The model chosen for classification was discriminant function analysis.

Given the nature of the measurements taken in this study, it was not unreasonable to assume that the first three prerequisites for discriminant analysis were adequately satisfied. There were four groups (the four case types), measured by relatively independent variables that logically had underlying continuous scales with no variable correlating directly with another. The remaining two prerequisites may not have been as fully satisfied in this study, as the group covariance and the population normalcy were not investigated. However, Klecka (1980) states that discriminant analysis is a robust technique in the face of deviations from these two prerequisites.

The three canonical discriminant functions produced by the analysis were created such that the metric distances between the groups was at a maximum (Klecka, 1980). From the canonical discriminant function coefficients, a discriminant

score was calculated for each case. These discriminant scores were plotted in the space described by the discriminant functions. The scores were in standard deviation units. They, therefore, represented a standard measure of how closely a case fell to the group centroid (group mean discriminant score on each function). The centroids were also plotted. Those plots were a graphic representation of the separateness or uniqueness of the Random sample case types. The plots also gave an indication of the density of the clusters and how closely they lay around their center points.

Several other mathematical descriptors of the case type clusters were also supplied through the discriminant analysis. The pooled within groups correlations between discriminating variables and the discriminant functions indicated how closely variables and functions were related. This allowed the "naming" of the functions on the basis of the most strongly correlating variables. This gave the dimensions of the discriminant space some characteristics and enabled one to determine along which characteristics the groups differed (Klecka, 1980).

From the between groups sum of squares and the within groups sum of squares, eigenvalues were calculated for each function. The larger the eigenvalue, a relative value, the more the groups were separated on that function (Klecka,1980). Each function was examined for its discriminating power. If a function accounted for a

substantial amount of variance it was retained for classification purposes. If a function was associated with a high canonical correlation value (close to 1.0) it was retained because that value is the proportion of variance in the discriminant function explained by the groups.

It was not appropriate to apply the Wilks lambda test of significance to the question of the probability that the sampled cases displayed the degree of discrimination when, in fact, there was no group differences in the population. The groupings had, a priori, been imposed by the cluster solution rather than measured on observable attributes that had occurred naturally in the population.

The next step undertaken in these analyses was to apply the discriminant functions, calculated from the random sample cases, to the team cases to produce discriminant scores for each team case on each function. From these scores the team cases were classified, using Bayesian classification rules, into the four groups or clusters. The team cases were plotted on a scattergram with the original cluster centroids.

The classification of the Team cases by the case type scheme was examined for plausibility. Once the team cases had been classified, initial risk indicator profiles were developed from the cases falling into each case type. Similarities between case type indicator profiles and team indicator profiles were examined. If these serial steps resulted in sensible classification of the Team cases, the

validity of the case typology was assumed to have been established at a reasonably adequate level.

Derivation of Service Sets from General Practice

During the data collection, the items on the list of services provided to a case were coded as "provided" or "not provided". Again the argument could be made for an underlying continuum with these variables. To provide or to not provide a service was a threshold decision for the child protection worker, dependent upon the severity of the clients condition, availability of services, and tenacity of the worker accessing services. These variables were, therefore, treated as continuous.

The Random sample cases were subjected to another cluster analysis in this section of the study. The difference was that similarities among cases were measured across the service variables. The analysis was conducted exactly as described under the "Derivation of case types" section. Two different cluster solutions were derived and examined. First, a four cluster solution was chosen, a priori, in order to facilitate the testing of the case type to service relationship hypothesis. The contention was that if a direct relationship existed, each of the four case types would be provided with a different set of services and, therefore, four sets of services would be the result of the cluster analysis.

For the second cluster solution, the formal tests and

heuristic procedures described in the "Derivation of case types" section were applied and a cluster solution obtained. The exercise of developing and labelling service profiles was repeated with the second service cluster solution. The two different solutions were used for investigating the case type to service set relationship hypothesis.

Relationship in General Practice

Once the case types had been derived and verified and plausible service sets delineated, an assessment-treatment framework had been developed. That which remained was an investigation of the degree of association between the two derived elements of the framework.

It was originally hypothesized that the cases that made up a particular case type would logically include the same cases that made up a particular service set if case types were provided with different sets of services. Therefore, a crosstabulation of cases in each case type by the cases in each service set was carried out and the significance of the chi-square statistic was calculated.

This was considered to be an indirect investigation of case type to service set relationship in that the service sets were formed independently of the case types. The case types, in no way, imposed the service set solution.

Part 2

Effect of the Multidisciplinary Team

In order to investigate the effect of the Multidisciplinary Team with respect to the case type to service set relationship, it was necessary to fit the Team cases into the framework derived in Part 1. The Team cases were classified according to the case type scheme using discriminant function analysis as discussed previously. The Team cases and the original cluster centroids were plotted in the space described by the discriminant functions. That allowed a visual examination of the "fit" of Team cases into the original cluster spaces.

Again, two solutions for Team service sets were derived. The first solution was arrived at after cluster analysis had been carried out on the Team cases and the four cluster solution selected. The reasoning for this selection was as in Part 1, a direct relationship would require four distinct sets of services.

The second service sets solution was arrived at by classifying the Team cases into the services sets as defined by the Random sample. This classification was carried out via cluster analysis across the services provided to the Team cases.

Once the Team cases had been placed into the derived case types and service sets (the framework) the relationship hypothesis was tested via the chi-square statistic.

In order to carry out comparisons, the assignment of Matched cases to case types and service sets was extracted from the Random sample results. The Matched cases were also crosstabulated and the chi-square statistic was calculated. The degree of association between case type and service set was studied between the Team and the Matched samples and between the Team and the Random samples. It was assumed that if the Team was more effective in providing focused services to child protection cases, the degree of association would have been greater with the Team cases than that found in the Matched or Random samples.

Summary

The above constitutes a detailed description of the data collection employed in this study and the statistical tools used to analyze that data. In brief, those tools used were cluster analysis to reduce the initial risk indicator data into case types, discriminant analysis to test that case type scheme with external cases, cluster analysis to reduce service data into service sets, and chi-square to test the relationship between case types and service sets. The next chapter details the results aceived through the application of those methods.

CHAPTER FOUR

RESULTS

Part 1

Case Types Found in General Practice

The cluster analysis of the 48 risk indicators for the Random sample cases resulted in an interpretable four-cluster solution (Table 4). Because the first large jump in the cluster coefficients occurred between the four cluster and the three cluster stages, it was decided to stop at the four-cluster stage (see cluster schedule, Appendix I).

From the risk indicator profiles shown in Table 4 it can be seen that cluster 1 contained cases that presented risks such as "alcohol/drug abuse", "criminal activity", "prior reports of abuse", "family violence", and in two cases, "sexual abuse". Cluster 2 was made up of cases presenting less urgent risks, mainly pertaining to elements missing from the home such as safe surroundings, one parent, adequate supervision, and food. Indicators that seemed to describe a neglectful situation were found in the cases making up cluster 3. Those indicators included "single parent", "alcohol/drug abuse", "poverty", " prior reports of neglect", "ill child", and "child left unsupervised" and "C.G. mental/physical illness". The cases in Cluster 4 presented risk indicators that seemed to be elements of

Table 4

Random Sample Clusters, Initial Risk Profiles and Labels

Cluster	N[1]	Initial Risk Indicator	Frequency[2]	Interpretive Label
1	32	Alcohol/drug abuse C.G.	22/32	
		Criminal activity of C.G.	11/32	
		Witness to Family Violence	11/32	COMISSIVE HOME:
		CG refuses responsibility	10/32	VIOLATION
		Prior reports of abuse	8/32	
		CG mental/physical illness	7/32	
		Battered wife	5/32	
		Sexual Abuse/Perp in home	2/32*	
		CG admits abuse	1/32*	
2	8	Unsafe Environment	8/8	
		Child left unsupervised	7/8	OMISSIVE HOME
		Single Parent	7/8	
		No food in the home	6/8	
3	39	Single Parent	37/39	
		Alcohol / Drug Abuse C.G.	17/39	
		Poverty or Social Assistance	10/39	COMISSIVE HOME:
		Prior Reports of Neglect	9/39	NEGLECT
		Child left unsupervised	7/39	
		Ill or handicapped child	7/39	
		CG mental/physical illness	7/39	

(cont'd)

Table 4

Cluster	N[1]	Initial Risk Indicator	Frequency[2]	Interpretive Label
4	10	Poverty or Social Assistance	10/10	
		C.G. mental/physical illness	9/10	DISADVANTAGED HOME
		Child often truant	6/10	
		Cultural Problems	4/10	

1 - number of cases found in that cluster

2 - number of cases in that cluster that contained the risk indicator specified

Note: * - those initial risk were found only in cases represented in this cluster

disadvantaged situations: "poverty", "C.G. mental/physical illness", "child truant", and "cultural problems".

The preliminary examination indicated that the clusters contained cases which could be distinguished on the basis of their most prevalent initial risk indicators. Therefore, the clusters were given the labels provided in Table 4. The labels were drawn up such that they described the situation or condition in which a potential child protection client might be found at initial investigation.

Validation of Case Type Scheme

The cases that made up the Random sample appeared to cluster into four logical case types. It was important to ensure that the four cluster solution was not an artifact of those particular 89 cases. Therefore, a cross-validation of the case types was carried out by replication within the Random sample. Ideally, to estimate generalizability, an entirely different set of cases would have been randomly drawn and cluster analyzed. Given the limited resources of this study, only this quasi-estimate of the stability of the cluster solution was undertaken. A subset of 46 Random sample cases was randomly selected and cluster analyzed.

The results of that separate cluster analysis did indicate that the four-cluster solution was relatively stable. The risk indicator profiles for the sub-sample, four cluster solution were similar to those of the original random sample clusters. In the sub-set cluster 3 was like

COMISSIVE HOME: VIOLATION, cluster 2 was like COMISSIVE HOME:NEGLECT and cluster 4 was like the DISADVANTAGED HOME. Cluster 1 in the sub sample was somewhat like OMISSIVE HOME.

As can be seen from Table 5, 74% of the cases were placed in similar clusters in both the clustering of the entire Random sample and the clustering of the subsample of 46 cases. The two solutions, from the two samples, appeared to be reasonably similar (chi-square = 96.16, p = 0.001). Disagreements in classification were most prevalent in the COMMISSIVE HOME:VIOLATION cluster.

The next step in the validation process was the cross-validation of case types by independent measures: court orders. The crosstabulation of case types by court orders is presented in Table 6. The pattern of court orders by case types did little to verify the case type clusters. The percentage of cases, from each case type, in each court order category was quite similar. There were, however, some points of note. The DISADVANTAGED type contained the greatest percentage of supervision orders and the least percentage of temporary guardianship. COMISSIVE HOME:VIOLATION cases showed the greatest percentage of temporary guardianship orders. The OMISSIVE case type involved, as would be expected, no court orders for permanent guardianship or secure treatment. Permanent guardianshiporders were found only in the two more urgent case types. Custody agreements were found more often in the

Table 5

Validation of Cluster Solution with Internal Sub-Sample

	Clusters from Sub-sample Cases				
Random Sample CLUSTERS	Similar to VIOLATION cluster	Similar to OMISSIVE HOME cluster	Similar to NEGLECT cluster	Similar to DISADVANTAGED cluster	1 N
1-COMMISSIVE HOME: VIOLATION	7	3	7	0	17
2-OMISSIVE HOME	0	3	0	0	3
3-COMMISSIVE HOME: NEGLECT	0	1	17	1	19
4-DISADVANTAGED HOME	0	0	0	7	7
Column Total	7	7	24	8	46

Chi-square = 96.16

p < 0.001

---

1 - Row Total

Table 6

Case Types[1] by Court Order

Case Types	Super-vision order	Temp-orary Guard.	Perm-anent Guard.	Secure treat-ment	Support agree-ment	Custody agree-ment
VIOLA-TION	20	21	5	3	4	9
OMISSIVE	3	4	0	0	2	2
NEGLECT	24	20	3	2	1	10
DISAD-VANTAGED	7	2	0	2	2	1

1 - as derived by cluster analysis of Random sample data

two urgent case types as well.

The cross-validation of case types by external (Team) cases was accomplished by utilizing the four case types as the nominal categories for discriminating group membership. A discriminate function analysis provided information concerning both the mathematical nature of the random sample clusters or case types and the fit of the team cases into those case types.

Three canonical discriminant functions were derived from the discriminant analysis of the Random cases. An examination of the pooled within groups correlations between discriminating variables and the three canonical discriminating functions resulted in descriptors for each function as shown in Table 7.

Function 1 was primarily related to four risk indicators; "poverty or social assistance", "cultural disadvantaged", "C.G. mental or physical illness" and "child often truant". Function 1 was, therefore, seen to be a "disadvantaged" dimension. This solution indicated that the greatest distance between the groups was achieved when they were oriented along the "disadvantaged" dimension. The second function was labelled "violation(non-single parent)" dimension. This function indicated that the second greatest distance was achieved on the basis of four risk indicators: "family violence", "criminal activity of C.G.", "battered wife" and absence of "single parent". "Unsafe home", "no food in the home", "child left unsupervised", and absence of

Table 7

Correlations Between Discriminating Variables and Functions

Initial Risk Indicator	Correlation with Function 1	Function Label
Poverty/social assistance	0.300	Disadvantaged
Cultural disadvantaged	0.214	
C.G. Mental/physical illness	0.176	
Child often truant	0.171	
	Correlation with Function 2	**Function Label**
Single parent	-0.647	Violation non-single parent
Family violence	0.204	
Criminal activity	0.157	
Battered wife	0.123	
	Correlation with Function 3	**Function Label**
Unsafe environment	0.428	Omissive
No food in the home	0.398	
Child left unsupervised	0.277	
Bizzarre punishment	-0.124	

"bizarre punishment" correlated most highly with Function 3. That function was labelled the "ommissive" dimension and it accounted for the least distance between the groups.

The mathematical descriptors of the three discriminant functions given in Table 8 indicated that the groups were well separated along the three functions. The eigenvalues of 11.78, 5.45 and 3.25 indicated that the cases within the groups, as separated along the functions, were more similar to each other than they were to cases in other clusters. The canonical correlation figures demonstrated a high degree of association between the discriminant scores and the functions (Klecka, 1980). The cumulative percent variance figures showed that all three functions were necessary to account for over ninety per cent of the differences between the groups.

Once the average discriminant score for all cases within a derived group was calculated it was plotted on a 3 dimensional space defined by canonical function 1, 2 and 3 (see Figure 1). These average scores, called group centroids, gave an indication of how well the clusters were separated, at their centre. The centroids are provided in Table 8.

This plot (Figure 1) demonstrated that cluster 1 (COMMISSIVE HOME:VIOLATION) and cluster 4 (DISADVANTAGED HOME) were well separated and their cases tightly grouped. Cluster 3 (COMISSIVE HOME:NEGLECT) was well separated from Cluster 1 and Cluster 4, but not from Cluster 2 (OMISSIVE

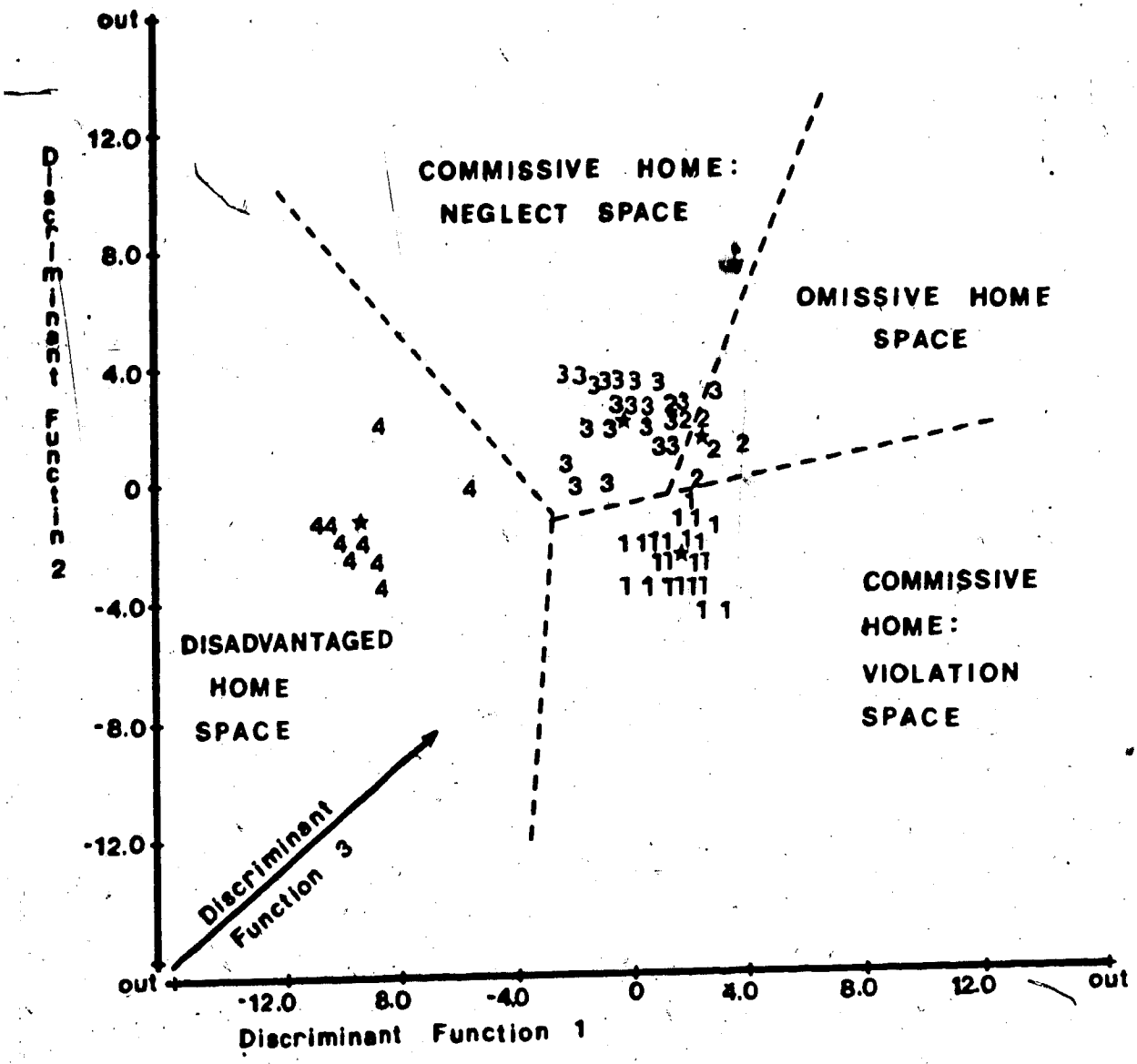
Table 8

Mathematical Descriptions of Discriminant Functions

	Function		
Descriptor	1	2	3
Eigenvalue	11.78	5.45	3.25
Percentage Variance	57.50	26.60	15.90
Cumulative Percentage Variance	57.50	84.10	100.00
Canonical Correlation	0.96	0.92	0.87
Group Centroids:			
for Cluster 1	2.02	-2.62	0.44
for Cluster 2	2.70	1.43	-5.47
for Cluster 3	0.05	2.27	0.93
for Cluster 4	-9.23	-1.56	-0.93

Figure 1

Cluster Spaces, Cluster Centroids (*), and Random Sample Cases[1] in each Cluster Space



1 - each Random sample cases is represented by a number. That number is the number of the case type into which the case falls; 1 = COMMISSIVE HOME:VIOLATION
2 = OMISSIVE HOME
3 = COMMISSIVE HOME:NEGLECT
4 = DISADVANTAGED HOME

HOME).

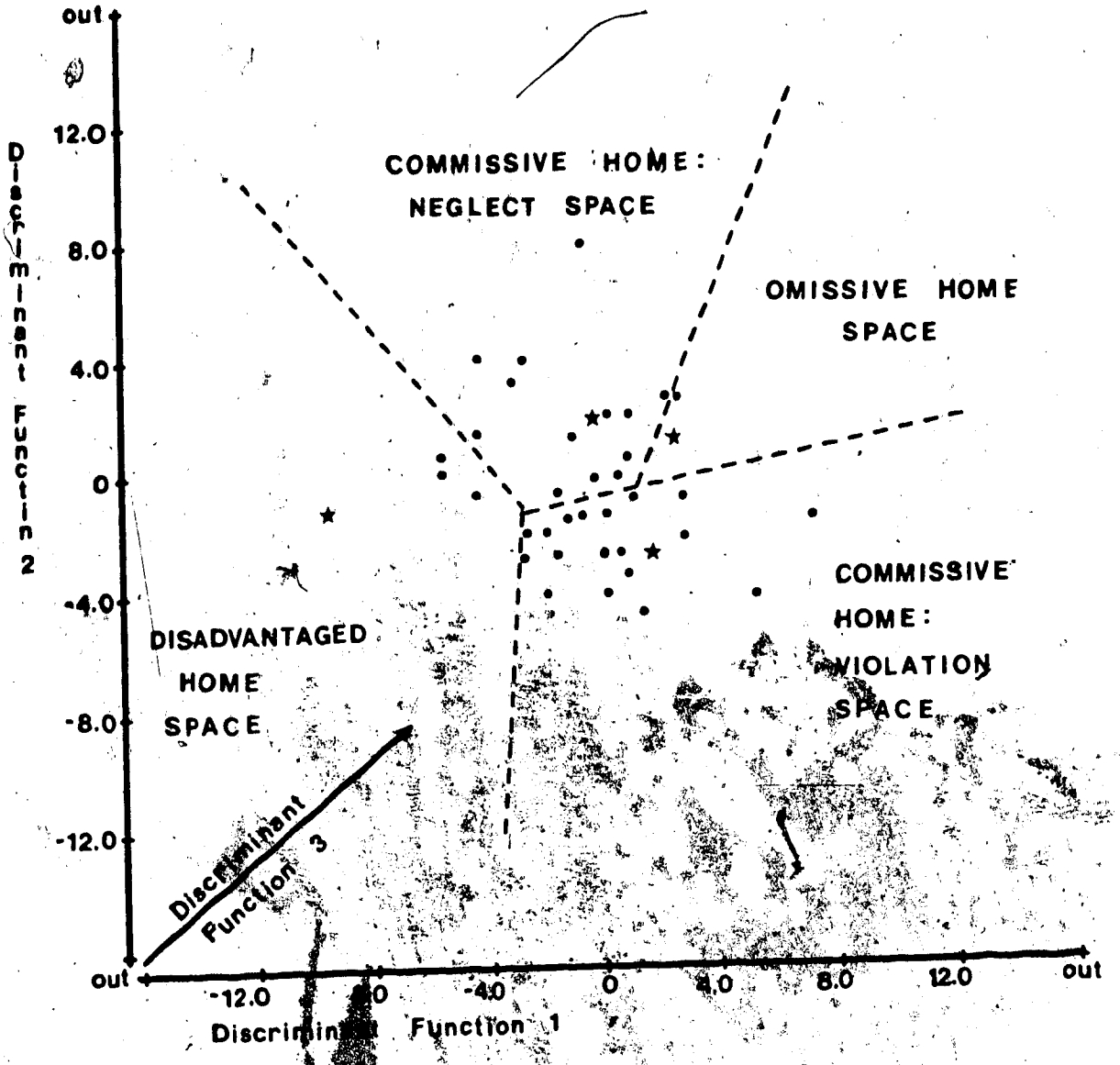
Despite the apparent similarity of COMMISSIVE HOME:NEGLECT and OMISSIVE HOME, the classification accuracy of the discriminant functions was acceptable. When actual cluster membership was compared to cluster membership as predicted by discriminant analysis, 98.92% of the cases had been classified correctly (See Appendix II for complete prediction solution and classification tables). Such a high correct classification rate should not be taken as strong evidence of the accuracy of classification using the original cluster solution since the two solutions are based on the same data set and as such form a circuitous method of cross-validation. The consistency merely indicated that a discriminant analysis of the four cluster solution provided verification that a good discrimination can be made of the four derived clusters.

Figure 2 illustrates the manner in which the sample of Team cases assembled around the original cluster centroids after they were classified into the cluster spaces by the discriminant function analysis. That plot indicated that the majority of team cases fell into the two more urgent case type spaces. Membership of the team cases in the case types previously derived from the independent Random sample, as classified by discriminant function analysis, is given in Table 9.

Ninety percent of the Team cases were, indeed, classified as members of either cluster 1 or 3, the two more

Figure 2

Random Sample Cluster Centroids (*) and Team Cases[1] as Classified into Cluster Spaces by Discriminant Analysis



1 - each Team Case is represented by a •

Table 9

Classification of Team Cases into Case Types

Case Types	Number of Team Cases Placed in Cluster by Discriminant Analysis	Percentage of Team Cases in Cluster
COMMISSIVE HOME: VIOLATION	23	56.1
OMISSIVE HOME	1	2.5
COMMISSIVE HOME: NEGLECT	14	34.1
DISADVANTAGED HOME	3	7.3

complex, urgent types. The risk indicator profiles for the team cases classified into cluster 1 and cluster 3 are given in Appendix III. For both groups of Team cases, the risk indicator profiles contained all the risks present in their classification case types.

These findings provide much stronger evidence that the original derivation and interpretation of the four Random sample clusters were indeed accurate and generalizable to some degree. Only relatively more problematic cases are referred to the Multidisciplinary Team and these are, in practice, usually related to COMMISSIVE HOME:VIOLATION and COMMISSIVE HOME:NEGLECT rather than DISADVANTAGED HOME or OMISSIVE HOME environments.

Service Sets from General Practice

The first cluster analysis of the service variables from the Random sample cases was stopped at the four cluster stage. The service profile from each cluster was compiled but meaningful labels could not be ascribed to the four clusters. The four sets of services did not seem to be addressing particular risks or focusing on specific treatment modalities, locations or plans.

A second cluster solution of the service variables was more fruitful. The largest jump in the cluster coefficients for this analysis was found between the three cluster and the two cluster stages, an indication that the three cluster solution was probably the most appropriate (for cluster

Table 10

Service Profiles from Random Sample Service Clusters

Cluster	N[1]	Services Provided	Frequency[2]	Interpretive Label
1	31	temporary guardianship	28/31	
		foster home	26/31	
		medical treatment	18/31	
		food, clothing, shelter	15/31	Change Environment: Out of Home
		educational support	15/31	
		supervision order	12/31	
		custody agreement	11/31	
		psychological assessment	11/31	
		individual counselling	11/31	
		monitoring home situation	11/31	
		emergency accommodation	11/31	
		addiction counselling	9/31	
		adoption	2/31	
2	40	supervision order	33/40	
		monitor home situation	22/40	Change Environment: In Home
		family aide	18/40	
		medical treatment	14/40	
		foster home	8/40	
		psychological assessment	8/40	
		educational support	8/40	

(cont'd)

Table 10

Cluster	N[1]	Services Provided	Frequency[2]	Intrepretive Label
3	18	foster home	17/18	
		psychological assess.	17/18	
		temporary guardianship	17/18	Change Environment: Change Child
		medical treatment	13/18	
		monitor home situation	12/18	
		supervision orders	11/18	
		institutional care	10/18	
		individual counselling	10/18	
		food, clothing, shelter	10/18	
		assess school situation	9/18	
		psychiatric assessment	8/18	
		recreational activities	8/18	
		educational support	8/18	
		group home	7/18	
		cultural specific support	7/18	
		emergency accommodation	7/18	
		secure treatment order	6/18	
		custody agreement	6/18	
		addiction counselling	6/18	

1 - number of cases in that cluster

2 - number of cases, out of total number of cases in cluster that were provided with the specified service

schedule, see Appendix IV).

The three cluster solution profiles and their interpretive labels are provided in Table 10.

At first examination, the services seemed to group according to where the child would be located when the service was provided. The first cluster contained services that would be provided to a child outside the home or to the parents when the child has been removed from the home. Cluster 2 contained cases that had, for the most part, received services while the child was still in the home. Cluster 3, again, seemed to represent cases that had been served outside the home for the most part. The difference between Cluster 1 and Cluster 3 seemed to be that in 3 there are additional services provided that are directed at treating or changing the child rather that the environment as in 1 and 2. The services that are provided significantly more often in Cluster 3 are psychological assessment, institutional care, assess school situation, psychiatric assessment, recreational activities, group home, culturally specific support and group home.

At this point in the study, the application of quantitative models to general child protection practice data had delineated the elements of an assessment/treatment framework. The next step was to uncover how the elements of the framework related.

Relationship of Case Type to Service Set

Even though the four cluster service set solution had proven uninterpretable, the possibility of a direct relationship between case type and service set had to be examined. The results of the crosstabulation of membership in case types by membership in one of the four service sets is provided in Table 11. It was thought that if there was a direct relationship, the majority of cases within one case type would fall into one service cluster. The results shown in Table 11 did not follow that pattern. The probability of the chi-square statistic (0.09) also did not indicate a strong underlying association.

Given that the four cluster solution had been rejected, the possibility of a relationship within the three cluster solution was also investigated. The results of crosstabulation of membership in the case type clusters by membership in the three service clusters were as shown in the lower section of Table 11.

Change Environment: In Home services were provided to 70% the cases in the DISADVANTAGED cluster, 50% of the cases in the OMISSIVE cluster, 54% of the NEGLECT cluster, and 37% of the VIOLATION cluster in the Random sample. The Change Environment: Out of Home service set was provided to 41% of the VIOLATION, none of the OMISSIVE, 38% of the NEGLECT, and 20% of the cases in the DISADVANTAGED cluster in the Random sample. On the other hand, only 20% of the VIOLATION, 50% of the OMISSIVE, 8% of the NEGLECT, and 10% of the

Table 11

Random Sample Case Types by Services Sets

Solution	Service Cluster	Case Types: VIOLATION	OMISSIVE	NEGLECT	DISADVANTAGED	N	Chi-Square
1	1	13	0	15	2	30	
	2	10	4	20	7	41	14.75 (p=.09)
	3	5	2	1	0	8	
	4	4	2	3	1	10	
2	Change Environment: Out of Home	13	0	15	2	30	
	Change Environment: In Home	12	4	21	7	44	13.79 (p=.11)
	Change Environment: Change Child	7	4	3	1	15	

DISADVANTAGED cases in the Random sample received the Change Environment : Change Child service set. Of the cases that received the Change Environment: Out of Home service set, 93% were within COMMISSIVE:VIOLATION or COMMISSIVE:NEGLECT clusters. The chi-square statistic, however, did not indicate a strong relationship (p=0.11).

Part 2

Effect of the Multidisciplinary Team

The Team cases were classified into the four case types as described earlier (See Table 9).

The Team cases were also analyzed for plausible service sets. The four cluster solution resulting from the cluster analysis of the service variables with the Team sample was, again, not interpretable.

Nevertheless, the possibility of a relationship between the Team case types and the four Team service set clusters was investigated and compared to the Matched sample results. Those figures are given in Table 12 (upper section). Again, no underlying pattern was discernible in either sample (chi-square (Team) = 14.85, chi-square (Matched) = 6.88).

Classifying the Team sample services into three service sets via cluster analysis again proved more useful (for service profiles see Appendix V). It was noted that the three cluster solution was m[illegible]atically more sound and the three service sets which [illegible]re quite similar to the Random sample service sets [illegible] an important finding

Table 12

Team and Matched Samples Case Types by Service Clusters

Sample	Service Cluster	Case Types: VIOLATION	OMISSIVE	NEGLECT	DISADVANTAGED	1 N	Chi-Square
Team	1	4	1	2	2	9	
	2	0	0	2	1	3	14.85 (p=.09)
	3	5	0	8	0	23	
	4	4	0	2	0	6	
Matched	1	6	0	4	1	11	
	2	8	1	8	2	19	6.88 (p=.65)
	3	2	1	1	0	4	
	4	0	0	1	1	2	
Team	Change Environment: Out of Home	4	1	2	2	9	
	Change Environment: In Home	4	0	4	1	9	9.39 (p=.32)
	Change Environment: Change Child	15	0	8	0	23	
Match	Change Environment: Out of Home	6	0	4	1	11	
	Change Environment: In Home	8	1	8	2	19	3.88 (p=.81)
	Change Environment: Change Child	2	1	2	1	6	

1 - number of cases in the specified Service Cluster

in that it was an external case cross-validation of the Random sample service sets. In the previous section dealing with case types it was not appropriate to apply cluster analysis to the Team cases because they were of a different nature and, therefore, discriminant analysis had to be used. In this section, however, it was appropriate to apply cluster analysis to both samples because the Team and the Random samples had come from the same community and the physical existence of services was equal although the Team may have altered actual access to those services.

A larger proportion of Team cases than of Random or Matched cases received the Change Environment: Change Child service set. Approximately equal proportions of Random and Matched cases received the Change Environment: Out of Home service set.

The relationship between Team case types and service sets was examined. From Table 12 it can be seen that only 17% of VIOLENT cases and 28% of NEGLECTFUL cases received the Change Environment: In Home services. The majority of Team cases, 66% of VIOLATION and 59% of NEGLECTFUL cases received the Change Environment: Change Child services. The Change Environment : Out of Home services were provided to a small percentage of Team cases; 17% of VIOLATION and 14% of NEGLECTFUL.

With the matched sample the majority of the cases received the Change Environment: In Home services. The next most prevalent category was the Change Environment: Out of

Home services with Change Environment: Change Child having been provided to only 6 out of 36 matched cases. The Team and the Matched samples did, therefore, not appear to be similar with respect to service set delivery.

In order to further investigate that difference a chi-square was calculated for the two samples by service set: Random and Team, Matched and Team. Those figures are provided in Table 13. Both chi-square statistics were significant at $p<0.01$. In comparison to other cases, the Team cases were much more likely to receive the cluster 3 service pattern. Team and Matched cases, were similar, and therefore, the difference in service delivery to these samples may be an effect of the consultation with the Team. On a more cautious note, since these data do not indicate which services where delivered before and which were delivered after Team consultation, it is possible that more heavily served cases were referred to the Team because more things had already been tried with them.

The major findings of the study were; the case type scheme that was validated to a degree, the service sets that were validated to a lesser degree, the degree of relationship between case type and service sets in the three samples, and the dirrerences between the Team and Matched samples. The implications of those results are explored in the next chapter.

Table 13

Comparison of Team to Random and Matched Service Delivery

Service Cluster	Team sample	Random sample	Chi-square	Team sample	Matched sample	Chi-square
Change Environment: Out of Home	9	30		9	11	
Change Environment: In Home	9	44	21.2 ($p<.01$)	9	19	13.5 ($p<.01$)
Change Environment: Change Child	23	15		23	6	

CHAPTER FIVE

CONCLUSIONS

Part 1

Case Types Derived from General Practice

The case types derived from the four cluster solution of Random sample risk indicators seemed to represent a plausible grouping of child maltreatment cases. The case types constituted a usable scheme for the classification of child protection cases, within the setting of this study. Thus, the first objective of the study was accomplished to a reasonable degree.

Stein and Rzepnicki (1984) advised that an acceptable decision-making standard must lend itself to the development of operational criteria which can be applied reliably on a case-by-case basis. This investigator believes the case type scheme derived in this study adheres, for the most part, to this recommendation. The initial risk indicators which make up the case type profiles could be used as operational criteria for aiding a decision regarding type of maltreatment.

One point of interest in the case type scheme was the high frequency of two risk indicators; "alcohol and drug abuse-CG" and "mental/physical illness C.G." in the two commissive types. This may be an artifact of the illusory

correlation effect (Tversky and Kahneman, 1974) and indicative of the importance of worker bias in decision-making. Despite the fact that less than 10% of all abusing parents display extreme contra-indications, workers may have recorded substance abuse or mental illness because those negative characteristics have, in their experience, been associated with past cases of abuse (Stein and Rezpnicki, 1984).

One should also note that the scheme did not differentiate physical abuse and sexual abuse into separate case types. The risk indicators which dealt with both kinds of abuse were found in the the profile of COMMISSIVE HOME: VIOLATION. As was pointed out in Chapter 2, some authors discuss physical abuse and sexual abuse separately while others group the two under various encompassing labels. The case types derived herein did not reflect that separation with respect to circumstances at investigation. However, this grouping of sexual abuse and physical abuse indicators into one case type may have been an artifact of the available data set. The "Limitations" section, Chapter 1, has referred to the low frequency of occurrence of those particular risk indicators in this data set. Studies on different, larger data sets need to be conducted before it will be known whether the COMMISSIVE HOME: VIOLATION case type is a true representation of one "violation of trust" case type.

The various cross validation investigations verified to

some degree, the plausibility of the typology. Judging from the internal cases cross validation results, 3 of the 4 case types were consistent in the sub-sample. The fourth, COMMISSIVE HOME:VIOLATION, was not consistent. That lack of consistency could be due to the above mentioned low frequency of important risk indicators in this category. The externally based cross validation study demonstrated that the cases were not only differentiated by risk indicators into case types but were also differentiated, to a small degree, into those same case types by variables external to the cluster analysis; court orders. This result could not be regarded as powerful evidence of validity of the case type scheme.

Figure 1 in Chapter 4 illustrated a reasonable degree of separation between the clusters of Random sample cases. A possible underlying structure was, to some extent, defined through an examination of the discriminant functions along which the case types were separated. The case type that was the most distinctly separated from the others was DISADVANTAGED HOME (see Figure 1) and the function or axis that provided the greatest separation was function 1 called "disadvantaged". This could be a graphic representation of the fact that this type does not have any omissive or commissive characteristics. The risks to the child are situational as opposed to intrinsic to the individuals.

Upon examination of the two dimentional graphic representation of the clusters (figure 1), OMISSIVE HOME did

not appear to be well separated from COMMISSIVE HOME: NEGLECT. It could be argued that the poor separation was an artifact of the twodimentional representation of a three-dimentional scattergram. The three dimentions were defined by the three discriminant functions listed in Table 7. From the cluster centroids given in Table 8 it was noted that the OMISSIVE HOME cluster and the COMMISSIVE HOME: NEGLECT cluster, while having centroids that lay close togeather on the second function (Violation) were clearly well separated on the other two functions (Omission and Disadvantage). On the basis of those separations, it was thought that the two clusters, OMISSIVE HOME and COMMISSIVE HOME: NEGLECT, were two distinct entities.

The reliability or generalizabiltiy of the case type scheme was not sufficiently addressed within this study. While the classification scheme did seem to generate plausible groupings of a second sample (the Team cases), further application of this scheme to other random samples is necessary before any conclusions can be drawn about its reliability. As was pointed out under "Limitations", Chapter 1, the population of cases used for this study may not be representative of other child protection cases in other areas. Further studies in a variety of settings are warranted.

Given the above conclusions concerning the mathematical limitations on the validity and reliability of the case types, it is important to note some points about the

qualitative limitations of this (or any) case type scheme for child welfare. Kahneman and Tverksy (1976) refer to this kind of classification scheme as a "representative heuristic". They state that "assignment is said to proceed on the basis of similarities between the objects to be assigned, and one's cognitive representations about members of different categories". This kind of heuristic assignment is useful in that it allows decision makers to reduce many pieces of information to a choice between a small number of similarity judgments.

These classification schemes can lead to problems if they are the only judgmental strategy employed by the decision-maker (Stein & Rzepnicki, 1984). An inherent danger in any classification scheme is that once a client has been assigned to a case type, expectations associated with that category may govern future interactions and judgments.

These qualitative limitations must be kept in mind if this case type scheme were to be used, in the field, in any decision support system. They should not, however, prevent the continued investigation of the use of case types because, as Avidson et al. (1986, p. 158) suggest, "resources will inevitably be limited (and) more effective means for identifying those who may need and perhaps benefit from an intervention are clearly required". A case classification scheme such as the one derived herein could be of use in a decision support system. Once a case had

been identified as fitting into a particular category, the worker could refer to a list of services which had been provided to that kind of case in the past. That could reduce decision time and, perhaps, make more efficient use of services. Data regarding effectiveness would be required to justify such use.

Service Sets Derived from General Practice

The four cluster solution of service sets was neither interpretable nor fruitful with respect to uncovering a statistical relationship between case type and service delivery.

The service sets derived from the three cluster solution of the Random sample did, however, represent a plausible grouping of interventions. The three service clusters were interpretable on the basis of their profiles. Those labels; "Change Environment: In Home", "Change Environment: Out of Home", and "Change Environment: Change Child" do not correspond to Kadushin's (1980) labels of "supplemental", "supportive", and "surrogate". They may, however, partially reflect the decision-making framework developed by Stein and Rzepnicki (1984). That latter framework outlines three child protection treatment goals in descending order of preference:

1) to maintain family life through the provision of services to children in their own home,

2) to return children, and thus restore family life,

when children have been placed in out of home care, and

3) to place children in permanent family homes through adoption or permanent guardianship (Stein & Rzepnicki, 1984).

The service set "Change Environment: In Home" derived in this study reflects the above treatment goal 1. The service set "Change Environment: Out of Home" may reflect the third treatment goal above but it would not be advisable to make a definite connection between the two due to the low frequency of permanent guardianship orders and adoptions in the "Change Environment: Out of Home" category. That was the only category in which adoptions were found but, still, the frequency was very low.

The last service set "Change Environment: Change Child", however, may differ from Stein and Rzepnicki's (1980) second treatment goal. Inherent in that goal is the the process of removing the child from the home, changing either the home or the child or both somewhat, and replacing the child in the home. Service set 3, "Change Environment: Change Child", does allude to that process but it is not possible to discern from the data the sequence of service provision. That sequence must be known before concluding that service set 3 is or is not similar to the second treatment goal.

The three service sets may also reflect the priorities for child protection practice as written in the Alberta Child Welfare Act (1985). The Act recommends that child protection workers strive for minimal intrusion into family

life (Government of Alberta, 1985). The "Change Environment: In Home" service set could be construed as representing that minimal degree of intervention. The Act also urges the return of a child to his/her natural family and, failing any possibility of return, permanent placement outside the home. The "Change Environment: Out of Home" service set may encompass both of these latter goals. The child's environment may be such that he or she must be removed either to be returned at a later date when the natural home environment has been improved or to be placed permanently in an environment away from the natural home.

If the above conjectures are valid, the last service set would not appear to fall within the treatment goal parameters of the Alberta Child Welfare Act (1985). This may be due to the fact that the treatment considerations as outlined in the Act refer only to modification of the child's environment whereas the "Change Environment: Change Child" set contains services that are directed toward treatment of the child as well as his or her environment. There may be a group of child protection clients for whom a change in environment is not sufficient: They may also require changes to their behavior in order that they may get the maximum benefit from a more positive environment.

It would appear that the Random sample cases reflected the treatment goals outlined above. The primary goal was maintenance of family life through provision of services while the child remains in the home. The "Change

Environment: In Home" cluster of services is the one most often provided to Random sample cases. Those services were provided to a portion of cases in all four case types. It is not unreasonable to postulate that, perhaps, the "Change Environment: In Home" services were provided to all types of cases initially because the workers had attempted to adhere to the primary goal of least disruption of family life.

The "Change Environment: Out of Home" set was provided to fewer Random sample cases than was the first service set. If "Change Environment: Out of Home" was, in fact, encompassing the second and third treatment goals, as referred to in the Act, it would appear that those more intrusive measures were being taken less often in the Random sample. Few of the Random sample cases received the "Change Environment: Change Child" service set which could indicate that few disturbed children were included in the Random sample or it could indicate that workers serving the cases in the random sample had difficulty in providing change-oriented services. Those interagency, interdisciplinary kinds of services (such as institutional placement, psychiatric assessment and treatment and psychological assessment) may be more difficult to access and provide.

Case Type to Service Set Relationship

The chosen methodology applied to the available data did not identify a direct relationship between the four case types and the four sets of services. That is, each of the

four case types did not receive a different set of services. This could be due to the fact that no relationship existed in general practice or it could be due to incorrect case types and service sets having been derived by the chosen methodology.

An examination of the relationship of case types to the three service sets was more fruitful. Direct associations were not found but some patterns did emerge. The majority of the two less urgent case types (DISADVANTAGED and OMISSIVE) received the least intrusive services. The Change Environment: Out of Home services were provided, almost exclusively, to the two urgent case types. That was an important finding in that it further validated the case types by indicating a relationship between degree of urgency and degree of intrusion.

Given those results, this study's response to the first research question posed (see p. 3) was necessarily:

> The application of the statistical models used in this study did not yield results consistent with the hypotheses that there are direct relationships between investigation and service delivery information when both of these sets of information are reduced to a few relatively discrete categories. However, a pattern of service delivery across the case types, did emerge and that pattern seemed to follow a treatment goal model to some degree. Sequential service delivery studies are necessary to verify that pattern.

This lack of conclusive separation of services across case types does not necessarily mean that there was no direct relationship in the process of assessment and treatment of child maltreatment. One of the stumbling

blocks to uncovering a direct relationship may have been the lack of documented assessment-oriented treatment plans. Without exception, the child protection files did not contain statements linking a service or intervention to the specific need or risk which compelled the worker to provide that service.

That lack of documentation and the tentative indication of the use of a treatment goal model prompted the formation of this study's first recommendation:

> On every child protection file there should be a care plan and that plan should contain a description of the needs of the child, a statement outlining the need-oriented justification for each service recommended in the care plan, and the treatment goals of the care plan.

Part 2

Case Types with Team and Matched Samples

The cases seen by the Multidisciplinary Team, as classified by the derived typology, were for the most part, the more urgent kinds of cases where maltreatment was actually occurring. This was not an unexpected result given the mandate of multidisciplinary teams as described in Chapter 2. It is not unreasonable to conclude that such results were an indication of the validity of the case classification scheme. One might well expect to find that the more urgent, demanding cases would be referred to a Team, and it would appear the use of the typology has reflected such an occurrence. If the Team was indeed seeing

the more urgent cases, some indication existed that the Team was being used appropriately.

The Matched cases were, in fact, similar to the Team cases if one relied on the derived classification scheme to provide the descriptions. Application of the scheme resulted in the majority of the Matched cases falling into the two more urgent case types, as happened with the Team sample.

Relationship in Team and Matched Samples

Again, with the Team sample a direct relationship between case type and service provision was not uncovered. As with the Random sample, this was possibly due to the lack of evidence of use of initial risk indicators as justification of provision of a particular service rather than the lack of an underlying relationship.

However, an examination of the three service sets by case type solution led to the conclusion that the Multidisciplinary Team does seem to have an effect on service delivery. Fewer Team cases received the "Change Environment: In Home" and "Change Environment: Out of Home" service sets. The majority of Team cases in the COMMISSIVE HOME: VIOLATION and COMMISSIVE HOME: NEGLECT types received the "Change Environment: Change Child" services. That result might be interpreted as indicating that the Multidisciplinary Team was facilitating the provision of different intervention for those types of cases (in

comparison to those provided to the Matched sample cases).

That result could also be interpreted as indicating that more disturbed children were included in the Team sample than in the Matched sample. However, because the two samples were matched on reason for referral to child protection services and when the case was opened one could conclude that the children in the two samples were quite similar.

The Team cases in the two urgent types received less of the "Change Environment: Out of Home" services. The Team may have been able to augment the first and third treatment goals, temporary or permanent removal of child from home of origin, through greater accessibility to and awareness of the change-oriented services.

The results from the Matched sample would seem to verify the conclusion that Team cases were served differently than similar non-Team cases. In the Matched sample, the majority of the COMMISSIVE HOME:VIOLATION and COMMISSIVE HOME: NEGLECT cases received the "Change Environment:In Home" service set. The "Change Environment: Out of Home" service set was provided the next most often to those two types. The "Change Environment:Change Child" services were provided to the smallest number of cases in the Matched sample. These results, again, led to the conclusion that the Multidisciplinary Team might well have been facilitating the provision of the change-oriented services to the NEGLECT and VIOLATION case types.

Given the above findings and interpretations, the answer to the second question posed for this study (see p. 6) was as follows:

> The child abuse and neglect cases seen by the multidisciplinary consultation team did seem to demonstrate a pattern between case type and service provision. Similar cases not seen by the team did not demonstrate the same pattern of service delivery across the case types.

The findings of this study regarding the possible impact of the Multidisciplinary Team are consistant with but do not compel the second recommendation of this study:

> The Multidisciplinary Team studied herein should continue to be available to the child protection workers for use with urgent, complex cases that require decisi[redacted]ing and provision of services that may be difficu[redacted] access. This Team, and others like it, should be regularly evaluated with respect to how, when, and by whom services are provided to cases on which they consult. Outcome measures should also be taken in order to assess the effectiveness of the Teams.

There are some further conclusions that must be drawn from the case type by service results. There was little differentiation, within these data, in service provision between the COMMISSIVE HOME: VIOLATION and COMMISSIVE HOME: NEGLECT case types. The literature suggests that these two types of maltreatment should have different etiologies and may require different treatment (Kent, 1976 and Wolfe, 1985). Given the contention of this study that the statistical model chosen was suitable to the data and reflective of the theory, this finding was of concern. If the model was correct and resulted in similar service

patterns to the two different case types, then one might postulate a lack of connection between the kind of maltreatment and the services provided. On a cautionary note, the correctness of the model is the contention of this particular study and more research would have to be conducted before that contention could be verified.

Further Studies

It is important that the reader be left with a word of caution and a recommendation for further studies. This study dealt only with the process of general child protection practices and a Multidisciplinary Team. This study made the assumption that, because the processes were in place and supported by knowledgable professionals, they were the appropriate processes. The next step must be an investigation of that assumption through a study of outcomes from each process and case type combinations. Before any conclusions can be drawn about the efficacy of general practice versus multidisciplinary teams more must be known about their effect on the children and families receiving child protection services. That statement formed the basis of this study's final recommendation:

> In future studies of this type not only should larger and more varied samples be employed, but the studies should also be expanded to investigate the outcome of different types of child protection clients provided with the various [illegible] to determine which pattern, if any, [illegible] to the child.

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APPENDICES

Appendix I: Risk Indicator Cluster Schedule

Cluster Stage	Coefficient[1]
1	.000000
2	.500000
3	1.000000
4	2.000000
5	2.500000
6	3.000000
7	3.500000
8	4.000000
9	4.666666
10	5.499999
11	6.333332
12	7.166665
13	7.999998
14	8.899998
15	9.816664
16	10.766664
17	11.766663
18	12.766663
19	13.766663
20	14.766663
21	15.766663
22	16.766663
23	18.099991
24	19.599976
25	21.099960
26	22.599945
27	24.099930
28	25.599915
29	27.099899
30	28.599884
31	30.099869
32	31.599854
33	33.099838
34	34.599823
35	36.099808
36	37.599792
37	39.266449
38	40.933105
39	42.599762
40	44.366425
41	46.133087
42	47.966415
43	49.799744
44	51.799728
45	53.799713

(cont.,d)

Cluster Stage	Coefficient
46	55.799698
47	58.099686
48	60.433014
49	62.932999
50	65.532990
51	68.166306
52	70.899628
53	73.732941
54	76.732925
55	79.732910
56	82.732895
57	[illegible]880
58	[illegible]864
59	[illegible]521
60	95.066177
61	98.266174
62	101.516159
63	105.016144
64	108.522186
65	112.165024
66	115.865005
67	119.807846
68	123.774506
69	128.052261
70	132.385590
71	136.885574
72	141.717056
73	146.861481
74	152.167023
75	157.657486
76	163.657471
77	169.718048
78	175.884705
79	182.184692
80	189.738831
81	198.168472
82	206.696228
83	216.475891
84	227.998016
85	241.630676
86	256.920654
87	276.754883
88	300.105957

1 - coefficients are the squared Euclidean distances between the cases forming the clusters at each stage.

Appendix II: Discriminant Analysis Classification Table

Actual Group	No. of Cases	Predicted Group Membership 1	2	3	4
1	34	34 100.0%	0 0.0%	0 0.0%	0 0.0%
2	8	0 0.0%	8 100.0%	0 0.0%	0 0.0%
3	41	1 2.4%	0 0.0%	40 97.6%	0 0.0%
4	10	0 0.0%	0 0.0%	0 0.0%	10 100.0%

Note: 98.92% of Grouped cases were correctly classified.

Appendix III: Risk Indicator Profiles of Team Cases as Classified by Discriminant Analysis

Case Type	N	Initial Risk Indicators	Frequency	Interpretive Label
1	23	Alcohol/Drug abuse C.G.	8/23	
		Criminal activity C.G.	5/23	
		Witness to family violence	4/23	COMMISSIVE
		C.G. refuses responsibility	5/23	HOME:
		Prior reports of abuse	3/23	VIOLATION
		C.G. mental/phys. illness	6/23	
		Sexual abuse/perp. in home	2/23	
		Age-inappropriate punish.	4/23	
		Injury/inconsist. explan.	4/23	
		Med. evidence of prior abuse	2/23	
3	14	Single parent	12/14	
		Alcohol/Drug abuse C.G.	9/14	
		Poverty/Social assistance	3/14	COMMISSIVE
		Prior reports of neglect	5/14	HOME:
		Child left unsupervised	7/14	NEGLECT
		Ill/handicapped child	4/14	
		C.G. mental/phys. illness	4/14	

Appendix IV: Service Set Cluster Schedule

Cluster Stage	Coefficient
1	.000000
2	.000000
3	.500000
4	1.000000
5	1.666666
6	2.416665
7	3.249998
8	4.099998
9	5.099998
10	6.099998
11	7.099998
12	8.099998
13	9.099998
14	10.099998
15	11.599997
16	13.099996
17	14.599995
18	16.099991
19	17.599976
20	19.233307
21	21.233292
22	23.233276
23	25.233261
24	27.233246
25	29.233231
26	31.433228
27	33.766556
28	36.266541
29	38.766525
30	41.266510
31	43.933167
32	46.933151
33	49.933136
34	52.933121
35	55.933105
36	58.933090
37	62.183075
38	65.511627
39	68.844955
40	72.178284
41	75.511612
42	78.978256
43	82.478241
44	85.978226
45	89.533768
46	93.486130
47	93.486130
48	97.486130
49	101.486130

(cont.,d)

Cluster Stage	Coefficient
50	105.486130
51	109.486130
52	113.486130
53	117.686111
54	121.936096
55	126.269242
56	130.602753
57	134.947189
58	139.447174
59	143.973129
60	148.739777
61	153.656433
62	158.606430
63	163.606415
64	168.856400
65	174.189728
66	179.689713
67	185.189697
68	190.689682
69	196.499191
70	202.332504
71	208.538040
72	214.964417
73	221.964401
74	229.321533
75	236.788193
76	244.867533
77	253.096100
78	261.824463
79	271.359610
80	281.427490
81	291.536865
82	302.255127
83	313.701416
84	325.481445
85	338.508545
86	352.574951
87	370.399658
88	390.924076