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BEHAVIORAL CHARACTERISTICS ASSOCIATED WITH  
ACCIDENTAL POISONING IN CHILDHOOD

by

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Approved  
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## ABSTRACT

Two groups of parents from different socio-economic levels were questioned about the behavioral characteristics of their children before 18 months and subsequent incidences of accidental poisoning. The data collected showed proportional numbers of accidental poisonings regardless of parent education, race or income. Unusual activity in the child before 18 months was the best predictor of accidental poisoning during childhood.

## BEHAVIORAL CHARACTERISTICS ASSOCIATED WITH ACCIDENTAL POISONING IN CHILDHOOD

Accidental poisoning of young children by household agents and drugs is still one of the leading problems in the field of pediatrics. In 1969, 76,155 cases of poisonings in children under age five were reported<sup>1</sup>. The seriousness of the problem has given rise to many studies, most of which, until recently, have indicated inadequate parental supervision and the accessibility of the poison as major factors. Current research suggests that personality characteristics and emotional environment, combine in a complex way, to produce a child who is temperamentally more inclined toward accidental poisoning.

### Survey of the Literature

Jacobziner<sup>2</sup> concluded that most poisonings were due to carelessness on the part of the parent and poor choice of storage place. In 1966<sup>3</sup> he found that poisoning incidence was higher in lower class and non-white areas. Seventy per cent of the children in his sample were characterized as active and curious.

Baltimore and Meyer<sup>4</sup> found children who had been poisoned to be more daring but not more impulsive or active. They found no difference in accident proneness between poisoned and non-poisoned children. However, exaggerated oral tendencies

were described almost twice as often for the poisoned children. Their study found no difference in the number or pattern of storage of potentially toxic agents in the home, between poisoned and non-poisoned children.

Koumans<sup>5</sup> found availability, easy accessibility and oral exploration as possible factors in poisoning incidents. He postulated a "purposeful behavior" behind the accidents.

Sobel<sup>6</sup> found that social class, religion, income, family size, accident proneness, environmental hazard or lack of parental supervision did not correlate with repeated episodes of poisoning in children. He also found that there was no correlation between the accessibility of poisons in a house and whether or not children in that house had been poisoned<sup>7</sup>.

Stewart<sup>8</sup> in 1970 argued that hyperactive children were significantly more common in the whole poison group and among poisoned boys. In his study, mothers commonly reported that their hyperactive children were very active in the crib, had feeding, sleep and general health problems significantly more than normal children.

#### Method

This paper presents the findings of two studies, the first done during the summer of 1970 predicted poisoning in children on the basis of behavioral indicators that could be applied to children under 18 months of age. The second study was a follow-up carried out in the spring of 1971 designed to verify the findings of the first study and to extend its scope.

The 1970 study was an outgrowth of the Oregon Collaborative Perinatal Study. Under this study children have been followed for seven years starting at the time of the mothers first visit to the obstetrical clinic. The pregnancy and delivery were observed closely and the children followed according to a standard protocol. Of the 1500 children followed, 141 had been accidentally poisoned by the time they were seven. Two groups of 82 children each were selected at random from the non-poisoned children to serve as controls. Sixty-six variables were chosen from the data collected on the children and their families. Because of computer limitations, stepwise discriminant analysis of the data was done in two parts, each part containing analysis of thirty three variables.

TABLE 1

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Stepwise discriminant analysis of variables 1-33

Step No.	Variable No.	Variable Name
1	12	Unusual amount of activity reported at 12 months.
2	13	Unusual amount of activity reported at 18 months.
3	21	Amount of medication given by 18 months.
4	22	Unusual amount of crying reported by 4 months.
5	18	Amount of medication given by 4 months.

Stepwise discriminant analysis of variables 36-66

1	16	Degree of dependency at 4 year psychological exam.
2	9	Mothers education
3	6	Activity level at 8 month psychological exam.
4	15	Degree of cooperation at 4 year psychological exam.
5	12	WISC performance score.

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Variables selected for this particular study pertained to physical abnormalities, feeding problems, degree of activity, injuries, crying, behavior profiles, intelligence or both mother and child, socio-economic factors and emotional problems. In the course of computing discriminant functions, the entire group of children (one poisoned group and two control groups) were studied for each variable.

On the basis of discriminant functions computed from the basic sixty-six variables we were able to classify a child correctly as a poison risk 67% of the time and to classify a child correctly as a non-poison risk 70% of the time. Those variables which stood out before the child was 18 months of age were unusual amount of activity, unusual amount of crying, and medications given. The mothers seemed to view the children who were later poison victims as less active than expected for that age. The psychologist judged their activity levels as above the mean for the group when the children were examined at 8 months. From this data we feel that the child who is likely to be accidentally poisoned during childhood can be identified in the first year of life.

The first study served to identify predictors of childhood poisoning in a sample made up predominately from the lower socio-economic class. This second study, done in the spring of 1971, was designed to test the indicators over an upper and middle socio-economic class sample. Another objective was to test the hypothesis that accidental poisoning of

children does occur in families from all classes.

Data from the second study were obtained by attending the evening parent meetings of 23 of the 25 cooperative pre-schools in the Portland Metropolitan area. During the meeting the parents were asked to fill out a questionnaire for each child under six years of age in their family.

The scope of the questionnaire covered questions about whether and how the child had been poisoned or injured, medicine taken before 18 months, unusual type and amount of activity and crying before 18 months, feeding problems before 18 months, mental problems in the family, marital status of the family, occupation and education of both mother and father and income of the family.

### Results

Seven hundred and twenty two children were studied of whom 95 had been poisoned at least once. This was 13% of the total population compared with 9.4% in the first study. Education was high for both mothers and fathers. Occupations of the fathers tended to be either white collar or professional.

The children who were poisoned were reported to have more unusual amount of activity than the non-poisoned group.



TABLE 2

	Poisoned	Non-poisoned	Total
unusual amount of activity	26	89	115
no unusual amount of activity	67	530	597
	93	619	712
Chi Square=10.98	degrees of freedom=1		

The poisoned group's mothers reported more unusual types of activity before their children were 18 months with head banging and temper tantrums being reported more than for the non-poisoned children. Children who had poisoned themselves did not require significantly more medication before 18 months than did non-poisoned children nor did they seem to have more injuries before 18 months. The poisoned child was not reported to have cried more or less than the non-poisoned child. Mental or emotional problems were not significantly higher in the poisoned child's family.

#### Discussion

From these results it can be seen that socio-economic level has little or no bearing on whether or not a child is accidentally poisoned. Neither race nor education of the

parent were significant when controlled for economic class.

Our first study and much of the literature points to over-activity in the infant as a predictor. Both of these studies suggests that unusual amount of activity, whether over-activity or under-activity, is a good predictor of accidental poisonings. The first study indicated that mothers often saw their children as under-active while a psychologists who tested the same babies at 8 months saw the child as over-active. This might suggest that neither the mother or the psychologist are an accurate judge of the childs level of activity and need some norm by which to compare it. In the second study, the mothers were being asked to give retrospective data that had to be recalled from up to six years previous. It is possible that some mothers recalled more unusual activity as a way of justifying their child's accidental poisoning. In either case, more study is needed to quantify activity in an infant and to set up standards by which over, under and normal activity can be judged. The authors are currently working to perfect a time-observation technique of measuring activity in infants and young children. Further work in the behavioral characteristics of children who poison themselves could then be based on these standards.

Summary

We have established in this study that accidental poisoning is reported in the same proportion regardless of socio-economic level, race or education of the parents. We have also established that unusual amount of activity occurs more frequently in infants who will poison themselves in childhood. No other variable is significant in both studies or over both socio-economic classes. Further research must be done to determine how best to identify and modify those infants who show the predictive activity levels. Of special interest will be the small group of infants who show unusual activity before 18 months but do not get poisoned. What is (or is not) present in their environment may give us insight into the basis for more effective poison prevention programs.

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