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ABSTRACT

This paper describes the procedures, instrumentation, data analysis and results of a pilot study of the extent of teachers' knowledge of (1) toy safety and (2) teachers' and children's preferences for toys. The survey was conducted in the form of a 22-item questionnaire administered during a training workshop for Head Start teachers. Teachers were asked about their professional experience, about the toys in their classroom, the toy preferences of teachers and children, accidents with toys and the need for more information on toy safety. Among the results, teachers appear to prefer Manipulative Toys and Miscellaneous Toys more than they perceive the children as preferring them. Teachers see children as preferring Action Toys and Make-Believe Toys more than do teachers. The teachers indicated that dangerous toys such as darts and roller skates were desirable for classroom use. Other attitudes expressed by teachers concerning the problems of toys and the causes of accidents further indicate the teachers' lack of information about toy safety. A chi-square analysis was run to determine if two factors had any bearing on teachers' responses: education, and whether or not the respondents had children. This analysis is included in Appendix A. (Author/RH)

TOY PREFERENCE AND SAFETY KNOWLEDGE

A PILOT SURVEY OF TEACHERS OF YOUNG CHILDREN

MARCH, 1980

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The following study is based on a literature review which has been summarized in the document TOYS -- MORE THAN TRIFLES FOR PLAY submitted to ERIC in March, 1980). The survey design of this pilot study and the data analysis were prepared by Patricia Stewart, who was a Business and Marketing Intern prior to entering Law School at the University of Texas. Donna Bricker-Derkacz and Barbara Kihnel of Southwest Educational Development Laboratory assisted in data collection and Martha Hartzog provided editorial assistance.

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A Pilot Survey of Teachers of Young Children

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The multi-billion toy industry is well supported by parents and other adults who purchase toys for young children. In addition to the single consumer who purchases for a specific, individual child, another consumer group has evolved - teachers, center directors and others responsible for the care and instruction of groups of children. More preschool children than ever before now attend public or private day care or Head Start programs. As more mothers of preschoolers enter the work force, child care programs will continue to increase. Public schools also enroll young children through kindergarten classes and special programs such as classes for the preschool handicapped child, or classes for young non-English speakers. Toys, usually called "manipulatives" or "instructional materials" to designate a more specific use, are purchased for each of these settings in which groups of children are served.

Toys, sometimes an abundance of them, are present in every center or classroom. After observing the types of toys and other equipment, the organization and use of these materials and following conversations with teachers, the senior author's curiosity was piqued. What does research say about toys - the selection, use, and value of toys? After an extensive review of the literature, the answer is "very little." A great

deal of information about toys does exist, but it relates primarily to the toy industry, claims and counter-claims of manufacturers, psychologists and child-development specialists, and safety factors. The results of this review have been summarized in a separate document Toys - More Than Trifles For Play (Evans and Stewart, March, 1980).

Based on this review of the literature, a pilot survey was conducted with 49 Head Start teachers in McAllen, Texas. The purposes of this survey were to determine the extent of teacher knowledge regarding toy safety and teacher/child preference for toys. This Toy Survey was considered a pilot study to test the validity of certain questions for obtaining the information, thus laying the groundwork for a more detailed and extensive study. The survey was conducted in the form of a questionnaire administered during a teacher training workshop. In the questionnaire teachers were asked about their professional experience; about the toys in their classroom and the toy preferences of teachers and children; about problems (accidents) with toys; and about the need for more information on toy safety. Many of the questions were open-ended in order to obtain as much information as possible for future study.

The results of this pilot study, including the procedure followed, instrumentation, and data analysis are described in the following sections.

Instrumentation

The first part of the Toy Safety Survey Questionnaire asked for information about the teachers: position, education, teaching experience,

average age of children taught, and the number of children per classroom. This was asked in order to determine if any of these factors would have an effect on the answer trends. See the section on Chi-Square Analysis for results. Questions were next asked about toys or materials the teachers liked best and least, along with toys or materials they felt the children liked best and least, and the reasons why. Teachers were asked to reply using the brand names of toys or the manufacturer's name, if known. This series of questions was designed to discover trends and reasons for preferences. The open-ended method allowed the teachers to explain their attitudes toward toys and their perceptions of the children's attitudes as well. In asking about the reasons for the teachers' choices, it was felt that information might be gleaned about their ability to assess the safety characteristics of toys and other traits. Teachers were given a list of toys and asked to identify the ones present in their classrooms and were asked to name other toys they would like to have. The list of toys purposely contained some which have been identified as dangerous for children of preschool age.* Answers to this section showed the overall distribution of toy types in the classroom, along with additional toys teachers desired, and gave an indication of teachers' knowledge about potentially dangerous.

In order to obtain information about toy hazards, teachers were asked to list problems they have had with toys. Teachers were also given a list of accidents and asked to check categories which applied (in their experience) concerning type and frequency of toy accidents. The list of

*See Table 1, page 6

accidents was selected from the Handbook on Toy Safety prepared by the Organization of Economic Cooperation and Development which set up the categories after analyzing injury reports from different countries. Teachers were then asked for their opinion about what causes toy accidents. This probe intended to show that accidents are not only caused by defective products, but also by other factors: toy selection, teacher supervision, broken toys, and children's abuse of toys.

The next group of questions pertained to toys at home. Teachers were asked if children brought toys from home and if teachers thought those toys were as safe as the toys at school. Even if toys in classrooms are generally safe, certain dangerous toys might be introduced from other sources.

In order to determine if there was a need and a desire for education on toy safety, teachers were asked if they wanted information on toy safety and if they felt that parents need similar information. Teachers were asked to indicate which format they preferred for such information. They were also asked if they thought toy makers know enough about children to make safe toys. This was an open-ended question allowing for varying opinions. The teachers were then asked if they would use a toy lending library. This appeared in the questionnaire in order to provide feedback for possible further research on the subject of toy libraries.

Finally teachers were asked if they had children of their own, and if so, what were their ages. The purpose was to help discriminate between teachers with and without children. In order to assess possible effects of this factor on the answer trends. The Toy Survey Questionnaire is shown in the following Table 1.

Table 1

TOY SURVEY QUESTIONNAIRE

NAME: _____

Position: _____

1. Years of Education: _____

   Highest Degree Earned:

   - ☐ Junior High School
   - ☐ High School
   - ☐ G. E. D., Graduate Equivalency Exam
   - ☐ C. D. A., Child Development Associate
   - ☐ Junior College
   - ☐ College OR Years of College 1 2 3 4 (Please circle)

2. Years of work with children:____ (Other than your own family)

3. Ages of children in your class:_____

4. Number of children in your class:_____

In the following questions, please use the brand names of toys or the manufacturer's name, if known.

5. What toys or materials do you like best?

   Why?

6. What toys or materials do you like least?

   Why?

7. What toys or materials do the children like best?

   Why?

8. What toys or materials do the children like least?

   Why?

10. Which of the following toys are in your classroom?

- ☐ pegboards & pegs
- ☐ blocks
- ☐ play darts
- ☐ stuffed animals
- ☐ puzzles
- ☐ play musical toys
- ☐ wind-up toys
- ☐ Barbie doll
- ☐ plastic dishes
- ☐ Jack-in-the-Box
- ☐ plastic cars
- ☐ roller skates
- ☐ play games
- ☐ battery-toys
- ☐ marbles, jacks
- ☐ Etch-A-Sketch
- ☐ playdough
- ☐ art materials
- ☐ Battlestar Galactica Spaceship
- ☐ flexible dolls
- ☐ Whizzies, boomerangs

11. Circle the above items you would like to have in your class. List below others you would like to have.

12. List problems with toys you consider important:

13. In your experience, how often have the following events occured?

	NEVER	SOMETIMES	OFTEN
child struck with toy (purposely or accidently)			
child swallowed toy object			
child fell off toy object			
child fell or stepped on toy object			
child lodged toy object into ear, eye, nose			
child received electrical shock from toy			
child broke off pieces of toy			
child was burned from toy			
child chewed off paint from toy			
child damaged clothing or furniture with toy			
other:_____			

14. In your opinion, what is (are) the main cause(s) of toy accidents?

15. Do children bring toys from home to school? ☐ yes ☐ no

16. Do you feel toys children use at home are ☐ safer than, ☐ about the same, or ☐ not as safe as toys used at school?

17. Would more information on toy safety be important to you? ☐ yes ☐ no

18. Do you feel parents need more information on toy safety? ☐ yes ☐ no

19. What kinds of information do you like? ☐ pamphlets ☐ training sessions ☐ other:_____

20. Do you believe that toy makers know enough about children to make toys that are safe? ☐ yes ☐ no ☐ no opinion
Why or Why not?

21. Would you like to be able to check toys out of a library building for free? ☐ yes ☐ no ☐ no opinion
Why or Why not?

22. Do you have children of your own? ☐ yes ☐ no, Ages:_____

The Toy Safety Survey was a pilot design to aid in the development of a more effective study for the future. Probe questions and open-ended questions were analyzed to find specific categories of answers which might be anticipated in future study. The different angles of investigation the questions addressed were experimental in nature, to determine which were most effective at retrieving the desire information. Some questions were used to test the reactions given by teachers. Detailed explanations provided by respondents will be used to construct more directive questions, including valuable interpretative remarks. Through this process, strong qualities of the initial pilot survey will be retained, with modifications added to avoid future problems. A more precise survey will be required to use certain statistical techniques for analyzing extensive data. These tests will be essential to establish more conclusive findings from the information gathered.

Chi-Square analysis was run to determine if two factors had any bearing on teacher responses: education, and whether or not the respondents had children. (A complete summary of this Chi Square analysis is included in Appendix A).

Data Analysis

Specific trends were evident in the Toy Safety Survey data and in the accompanying Chi-Square Analysis. First of all, the sample population studied was relatively homogenous, with similar background characteristics and teaching positions. The average years of education for the 49 respondents was 10.70. Education ranged from 6 years or junior high school (2 people) to Master's Degrees (1 person), with most respondents reporting high school or G.E.D. completion, or some college. See Table 2 for details.

Table 2

Education of Respondents

Education	No. of Respondents	% of Respondents
Junior High	2	4
High School	14	29
G. E. D.	17	35
C. D. A.	12	24
Junior College	3	6
College (one or more years)	13	26.5
	N = 49	100.5% (due to rounding error)

Most respondents reported that they worked with children ages 3 to 4 years old. However, children ranged in age from 2 1/2 to 10 years old. The average number of children in the classroom was 17.96 or 18 with a range of from 8 to 45 children. Respondents reported an average of 2.78 years experience working with children (Range = 0 to 19 years).

Teachers were then asked to list the toys they liked best and those they liked least. Some teachers responded by listing categories of toys while others listed brand names. Thirty-nine listed items by commercial or brand names. Name brands listed were Fisher-Price, Creative Playthings, Mattel, Tonka, Playskool, Child Craft, Sesame Street, Developmental Learning Materials, Heffernans, and Child Guidance, in that order. They liked lease Tonka Trucks, Battlestar Galactica, Star Wars, Mattel Trucks and Fisher-Price. See Table 3 for details on preferences.

Table 3

Teacher Toy Preferences by Brand Names

TOYS OR MATERIALS TEACHERS LIKED BEST

Name Brand	Times Mentioned	% of Total Mentioned
Fisher-Price	12	38 %
Creative Playthings	4	12.5
Mattel	4	12.5
Tonka	3	9
Playskool	3	9
Child Craft	2	6
DLM	1	3
Heffernan's	1	3
Sesame Street	1	3
Child Guidance	1	3
Total Responses	32	99% (1% due to rounding error)

TOYS OR MATERIALS TEACHERS LIKED LEAST

Name Brand	Times Mentioned	% of Total Mentioned
Tonka Trucks	2	40%
Battlestar Galactica & Star Wars	1	20
Mattel Trucks	1	20
Fisher-Price	1	20
Total Responses	5	100%

Teachers also responded by naming types of toys, rather than commercial brands. When teachers did not respond by name brands, for toys, their responses were grouped into categories of toys: Manipulatives, Action Toys, Make-Believe Areas, Outdoor Equipment, Art Materials, and Miscellaneous. There were 88 responses. Of these, 52% preferred Manipulatives;

10% preferred Action Toys; 11% Make-Believe Toys; 1% Outdoor Equipment; 8% Art Materials; 16% Miscellaneous. See Table 4.

Table 4

Toys Teachers Liked Best by Categories

Category	Times Mentioned	% of Total Mentioned
MANIPULATIVES*	5*	
. Blocks	11	
. Puzzles	25	
. Shape & Shape Box	1	
. Beads & String	3	
. Pegs & Board	1	
TOTAL	46	52%
ACTION TOYS		
. Trucks & Cars	6	
. Jump Ropes		
. Balls	2	
. Trains	1	
TOTAL	9	10%
MAKE-BELIEVE AREAS & MATERIALS		
. Kitchen Toys	3	
. Dress-Up Clothes		
. Dolls, Dollhouses & Furniture	7	
. Stuffed Animals	1	
TOTAL	11	11%
OUTDOOR EQUIPMENT	1	
. Tricycles		
. Swings		
. Bikes		
. Sandbox		
TOTAL	1	1%
ART MATERIALS	2	
. Crayolas & Coloring Book	2	
. Paints		
. Clay/Playdough	2	
. Glue: Cut & Paste	1	
TOTAL	7	8%
MISCELLANEOUS		
. Books	3	
. Old Maid Game	1	
. Wood Toys	2	
. "Creative" Toys -	2	
. Electric Toothbrush	1	
. Big, Soft, Colorful Toys	5	
TOTAL	14	16%
TOTAL RESPONSES	88	98%

*"Manipulatives" were referred to as a category 5 times.

The same categories held for non-brand name teacher responses to the question about toys or materials they liked least. There were a total of 50 responses: of these 14% were for Manipulatives; 10% for Action Toys; 10% for Art Materials; 46% for Miscellaneous; 20% for Other. The categories of Make-Believe and Outdoor Equipment were not mentioned. Under the Miscellaneous category were toys teachers felt would be dangerous. Sharp, heavy, and breakable were named the most times; toys with metal pieces and electrical/mechanical toys mentioned next most often. See Table 5.

Table 5

Categories of Toys Teachers Liked Least

Category	Times Mentioned	% of Total Mentioned
MANIPULATIVES		
. Blocks	1	
. Puzzles (with small pieces)	1	
. Shape & Shape Box		
. Pegs & Board	3	
. Beads & String	2	
TOTAL	7	14%
ACTION TOYS		
. Trucks & Cars (metal, plastic)	3	
. Jump Ropes	1	
. Balls		
. Trains		
. Darts	1	
TOTAL	5	10%
MAKE-BELIEVE AREAS & MATERIALS	0	0%
OUTDOOR EQUIPMENT	0	0%
ART MATERIALS		
. Crayolas & Coloring Books	1	
. Paints	2	
. Clay/Playdough	2	
. Glue: Cut & Paste		
. Drawing		
TOTAL	5	10%
MISCELLANEOUS		
. Books	3	
. Electrical/Mechanical Toys	2	
. Battlestar Galactica Toys	1	
. Guns & War Materials	1	
. Small Plastic Toys	3	
. Noisy Toys	1	
. Toys with Metal Pieces	3	
. Sharp, Heavy, Breakable Toys	4	
. Cheaply Made Toys	1	
. Glass Toys	1	
. Plastic Toys in General	3	
TOTAL	23	46%
OTHER RESPONSES		
. "All sorts"	1	
. "No comment"	1	
. No answer or "none"	8	
TOTAL	10	20%
TOTAL RESPONSES	50	100%

Teachers were next asked what toys or materials they felt the children liked best. There were 124 responses: 37% of these for Manipulatives; 12% for Action Toys; 24% for Make-Believe; 6% for Outdoor Equipment; 8% for Art Materials; 6% for Miscellaneous; and 6% for Other. See Table 6.

Table 6

Toys Children Like Best as Reported by Teachers

Category	Times Mentioned	% of Total Mentioned
MANIPULATIVES	7	
. Blocks	19	
. Puzzles	16	
. Shape & Shape Box	1	
. Pegs & Board	3	
. Beads & String		
TOTAL	46	37%
ACTION TOYS	1	
. Trucks & Cars	14	
. Jump Ropes		
. Balls		
. Trains		
. Darts		
TOTAL	15	12%
MAKE-BELIEVE AREAS & MATERIALS	3	
. Kitchen Toys 9		
Dishes 4		
Water 1	14	
. Dress-Up Clothes	1	
. Dolls, Dollhouse & Furniture	8	
. Stuffed Animals	4	
TOTAL	30	24%
OUTDOOR EQUIPMENT	2	
. Tricycles	1	
. Swings	2	
. Bikes	2	
. Sandbox	1	
TOTAL	8	6%
ART MATERIALS	4	
. Crayolas & Coloring Books		
. Paints	2	
. Clay/Playdough	3	
. Glue: Cut & Paste	1	
. Drawing		
TOTAL	10	8%
MISCELLANEOUS		
. Books	3	
. Old Maid Game	1	
. Colorful Toys	1	
. Others	2	
TOTAL	7	6%
OTHER RESPONSES		
. "All Toys"	1	
. "I don't know"	3	
. No Answers	4	
TOTAL	8	6%
TOTAL RESPONSES	124	99%

There were 52 responses to the question about what toys or materials children like least. The Other Responses category received 38% of the responses, the bulk of these representing no answer given. Miscellaneous Toys (books, table games, science area, musical toys, boys vs. girls toys) ranked second at 25%. Third in ranking were problem toys at 13% (small toys, ones difficult to play with, torn-up materials, and breakable toys). Fourth, at 12% were Manipulatives. See Table 7.

Table 7

Toys or Materials Children Liked Least as Reported by Teachers

Category	Respondents	Preference By %
MANIPULATIVES		
. Blocks	0	
.. Puzzles	6	
TOTAL	6	12%
ACTION TOYS		
. Trucks	1	
. Jump Rope	1	
. Bean Bags	1	
TOTAL	3	6%
MAKE-BELIEVE AREAS & MATERIALS		
. Kitchen Toys	1	
. Doll's Clothes	1	
TOTAL	2	4%
OUTDOOR EQUIPMENT	0	0%
ART MATERIALS	1	2%
MISCELLANEOUS		
. Books	7	
. Table Games	1	
. Science Area	1	
. Musical Toys	3	
. Boys' vs. Girls' Toys	1	
TOTAL	13	25%
PROBLEM TOYS		
. Small Toys	3	
. Difficult Toys to Play With	2	
. Torn-Up Materials	1	
. "Breakable Toys"	1	
TOTAL	7	13%
OTHER RESPONSES		
. "No Comment"	1	
. "I don't know"	2	
. No Answers	16	
. Others	1	
TOTAL	20	38%
TOTAL RESPONSES	52	100%

When teachers' preferences and their perceptions about children's preferences are compared, it seems that teachers prefer Manipulatives and Miscellaneous Toys more than they perceive the children as preferring them; while teachers see children as preferring Action Toys and Make-Believe Toys more than do the teachers. See Table 8.

Table 8

Comparison of Preferences

Categories	Teacher Preferences		Teacher Reported Child Preferences	
	Liked Best	Liked Least	Liked Best	Liked Least
Manipulatives	52%	14%	37%	12%
Action Toys	10%	10%	12%	6%
Make-Believe Toys	13%	0	24%	4%
Outdoor Equipment	1%	0	6%	0
Art Materials	8%	10%	8%	2%
Miscellaneous Toys	16%	46%	6%	25%
Problem Toys	0	-	0	13%
Other Responses	-	20%	6%	38%
Total Percentages	100%	100%	99%*	100%

* 99% due to rounding error
0 means that no toys were mentioned in the category
- means that the figures for this category were not accounted for (i.e.; Toys in the Miscellaneous category Least like by Teachers could also be noted as "Problem Toys").

Questions 5 through 8 of the questionnaire also asked for reasons to be given for preferences. The answers have been grouped in each case into categories, with individual qualities or characteristics specified,

when distinct, and the number of times mentioned indicated. The number of responses varies because an individual response could contain more than one reason for a preference. Table 9 sets forth the reasons teachers liked certain toys. There were 54 responses. The categories these reasons fell into, in order of preference, are: Educational, representing 29% of the responses; Safe, 25%; Child Likes 19%; Other 15%; Classroom Management 4%. The Other category includes the following responses: teacher likes, don't know, no preference, no answers. Classroom management represents such concerns as "easy to keep clean" and "keeps child quiet."

Table 9

Reasons Teachers Liked Toys

Reason	No. of Responses	% of Responses
CHILD LIKES	8	
. Fun For Child	2	
TOTAL	10	19%
EDUCATIONAL	3	
. Teaches Child	1	
. Allows for Building	1	
. Child Learns	2	
. Builds Skill & Works With Feelings	1	
. Professional	1	
. Use Minds	1	
. Use Motor Skills	2	
. Develop Problem Solving Skills	1	
. Challenging	1	
. Versatile	2	
TOTAL	15	29%
EASY	1	
. Simple	2	
. Familiar	1	
TOTAL	4	7%
SAFE	6	
. Durable	3	
. Healthy	1	
. Indestructible	1	
. Sturdy	1	
. Stronger	1	
TOTAL	13	25%
CLASSROOM MANAGEMENT		
. Easy to Keep & Clean	1	
. Keeps Child Quiet & Still	1	
TOTAL	2	4%
OTHER		
. Teacher Likes	2	
. Don't Know	3	
. No Preference	1	
. No Answer	4	
TOTAL	10	16%
TOTAL RESPONSES	54	100%

Table 10 sets forth reasons teachers did not like toys. There were 44 responses. Unsafe was mentioned 59%; Other (likes all toys) 18%; Classroom Management 13%; Not Educational 9%.

Table 10

Reasons Teachers Did Not Like Toys

Categories	No. of Responses	% of Responses
UNSAFE	4	
. Children Break & Eat	1	
. Causes Accidents	1	
. Break Easily	4	
. Child Tears Up	1	
. Harmful/Dangerous/Hurts	6	
. Small Size: Child Chokes or Puts in Mouth	6	
. Low Quality	1	
. Loose Pieces	1	
. Rough Play	1	
TOTAL	26	59%
NOT EDUCATIONAL	1	
. Bad Programming	1	
. Limited Versatility	1	
. Short Interest	1	
TOTAL	4	9%
CLASSROOM MANAGEMENT		
. Messy	2	
. Disturbs Others	2	
. Distracting	1	
. Child Feels Restless	1	
TOTAL	6	13%
OTHER		
. Likes All Toys	8	18%
TOTAL RESPONSES	44	99%*

*due to rounding error

When teachers reported their opinion on the reasons why children like particular toys, 22% of the 45 responses simply reported that children enjoyed them; other responses were more specific: 29% of the responses

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* due to rounding error

fit the category of Motor Activities; 16% Creative Reasons; 4% Social/ Emotional; 29% Other (combination of specific reasons with no responses).

Table 11

Reasons Children Like Toys According to Teachers

Categories	No. of Responses	% of Responses
CHILD ENJOYS	10	22%
CREATIVE	2	
. Like to Explore	1	
. Act & Fantasize	3	
. Use Imagination	1	
TOTAL	7	16%
MOTOR ACTIVITIES		
. Movable	1	
. Build With	3	
. Rides	2	
. Uses Hands	2	
. Strings	1	
. Helps Coordination	1	
. Manipulates	3	
TOTAL	13	29%
SOCIAL/EMOTIONAL		
. Share	1	
. Sense of Accomplishment	1	
TOTAL	2	4%
OTHER		
. Keeps Child Busy	1	
. Easy to Use	1	
. Soft & Cuddly	2	
. Boys Like to Make Sounds Like Trucks	1	
. I Don't Know	3	
. Like All Toys	1	
. No Answers	4	
TOTAL	13	29%
TOTAL RESPONSES	45	100%

Table 12 reports reasons children do not like toys, according to the teachers' perceptions. There were 40 responses. Almost half of these

represent no answer. Interestingly, the responses of the teachers reveal something about them rather than the children. Almost half do not know why children dislike toys. The reasons which are given fit into the Inappropriate category: the toys are inappropriate either because they are not at the right level for the children, or because they are hard to use due to size or fragility. Both of these reasons could be related to the teacher's choice of toys or their demonstration (or failure to demonstrate). Only one response relates to safety, which makes sense since that is not usually a concern of children.

Table 12

Reasons Children Dislike Toys According to Teachers

Categories	No. of Responses
INAPPROPRIATE	
. Hard to Understand	5
. Too Small	4
. Not Interesting/Challenging	2
. Not Enough Movement	3
. Takes Too Much Patience	1
. Don't Like Music	1
. Boys Don't Like Dolls and Girls Don't Like Cars	1
. Too Fragile	1
. Drab, Torn-Up	1
. Harmful	1
TOTAL	21
OTHER	
. No Answer	16
. I Don't Know	2
. No Comment	1
TOTAL	19
TOTAL RESPONSES	40

Questions 10 and 11 attempted to find out which toys are found in the teachers' classrooms. Teachers were presented with a list of toys and asked to (a) indicate which toys were in their classroom, (b) which ones on the list they would like to have, and (c) any other toys they would like. There were 49 respondents. It is clear from the responses that most classrooms have similar articles. Blocks, puzzles, and art materials were found in all the classrooms; while plastic dishes, pegboards & pegs, and playdough were in over 70%. Over 50% of the classrooms also have plastic cars, flexible dolls, play games, stuffed animals, and play musical toys were also in over 25% of the classrooms.

Important to the question at hand -- the safety of toys -- are the toys the teachers would like to have in their classrooms. Wind-up toys and battery toys were circled by a little over 25% of the teachers; Etch-A-Sketch by 16%; Battlestar Gallactica Spaceship and Whizzies and Boomerangs by 10%. Teachers also marked play darts and roller skates as desirable. Many of these toys have been proven dangerous.* Teachers are obviously not aware of this fact. Forty-four out of the 49 respondents did not list any other toys which they would like to have. The 5 respondents listed: books with records to go with them, clothes for dolls, more perceptual and role-playing toys, puppets, dollhouse and furniture, play (soft) tools, big chalkboard, Talk-A-Phone, musical TV, and more science materials. Table 13 shows the toys found in the classroom and the toys teachers would like to have.

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*See Evans and Stewart, Toy Safety Standards and the Toy Industry, Fall 1978.

Table 13

Toys Found in the Classroom &
Toys Teachers Want for the Classroom

Toy	Have	Would Like	Both*
Art Materials	49	6	4
Puzzles	49	3	3
Blocks	49	2	2
Plastic Dishes	39	5	4
Pegboards & Pegs	38	1	1
Playdough	35	5	3
Plastic Cars	28	8	2
Flexible Dolls	28	8	2
Play Musical Toys	19	8	1
Play Games	21	11	0
Stuffed Animals	14	12	2
Barbie Doll	10	6	1
Etch-A-Sketch	6	8	0
Marbles, Jacks	5	4	0
Wind-Up Toys	4	14	0
Battery Toys	3	13	0
Play Darts	2	1	0
Jack-In-The-Box	1	10	1
Whizzies, Boomerangs	1	5	1
Battlestar Gallactica Spaceship	0	5	0
Roller Skates	0	2	0

*Items in the Both column were reported by the respondent as both in the classroom and as an item the respondent would like to have. Interpretation of this may vary: it could be a simple mistake, or it could be that the teacher would like more of the item in her classroom.

Questions 12 - 14 pertain to toy safety in the classroom. Teachers were asked to list problems they have had with toys, to rank how often a list of problem events have occurred, and to name the main causes of toy accidents. The attitudes expressed by teachers concerning the problems of toys and the causes of accidents further point up the teachers' lack of information about toy safety. Thirty-three out of the 49 respondents (66%) did not answer the question asking them to name

* Items in the "Both column were reported by the respondent as both in the classroom and as an item the respondent would like to have. Interpretation of this may vary: it could be a simple mistake, or it could be that the teacher would like more of the item in her classroom.

problems with toys they considered important. This could be due to two reasons: either teachers do not know any problems or the question is not clearly phrased. Most of the reponses indicate problems exist because of size, durability, sharp pieces or edges, or children's misuse of toys.

Question 13 asked teachers to comment on a list of toy accidents and their frequency. The responses show that some types of accidents occur more frequently than others. Many of the accidents reported involve misuse of toys, lack of supervision, and defective toys. These accidents could be prevented by effective teacher education about toy safety. Again, unconsciously, teachers have revealed their lack of knowledge about toy safety. Table 14 sets forth the list of accidents provided the teachers along with the number of times the accident was said to have occurred. Not all participants reponded to each item (they may have skipped items which did not apply to them).

Table 14

Toy Accidents and Their Frequency

Accident	Frequency		
	Never	Sometimes	Often
Child Struck With Toy (purposely or Accidentally)	10	33	3
Child Swallowed Toy Object	42	4	-
Child Fell Off Toy Object	13	31	2
Child Fell or Stepped on Toy Object	18	8	2
Child Lodged Toy Object Into Ear, Eye, or Nose	36	10	1
Child Received Electrical Shock from Toy	40	4	1
Child Broke Off Pieces of Toy	8	31	8
Child was Burned From Toy	42	4	-
Child Chewed Off Paint From Toy	31	15	2
Child Damaged Clothing or Furniture with Toy	30	12	3

Question 14 asked, What are the main causes of toy accidents? Seventeen teachers did not respond to this question. The 32 teachers who did respond listed more than one reason or cause. Most responses could be grouped into four categories: Teacher's Fault (poor supervision), Child's Fault (misuse of toy), Toy Industry Fault (poor toy), and Other. Some responses can fit into more than one category. Below are the responses by category.

TEACHER'S FAULT
- Teacher should know toy adequate for age (2)
- Teacher should show child safety rules and how to use toys
- Teacher doesn't show child how to work/play with toys
- Poor arrangements, not having boundary lines
- Poor teaching supervision (2)
- No supervision of child
- Child left unattended, not shown how to play and put up things
- Left where they run into them
- Not appropriate toy
- Teacher's carelessness
- Child not taught to use material - have various accidents
- Lack of child training and poor supervision

CHILD'S FAULT
- Can't handle them well - leaving toys on floor, wrong toy for age
- Toys not used properly (2)
- Not careful (2)
- Not played with properly
- Kids fight over toys
- Child uses wrong way
- Toys not used properly
- Falling when they climb
- Taking away toys from another child

TOY INDUSTRY'S FAULT/POOR TOY
- Sharp edges (3)
- Electrical (2)
- Toys not made correctly
- Toy condition
- Poor materials in toys
- Poor construction
- When children break toys like sharp dishes

OTHER
- Attention of parents and adults
- Child always on stage of exploring
- Lack of education or training on safe toys for parents and teachers
- Lack of Government control over distribution of unsafe toys

15. Do Children bring toys from home?

16. Are home toys as safe as school toys?

That toys were brought to school from home was reported by 76% of the 49 respondents. Teachers were evenly divided on the question of whether toys at home are about as safe or not as safe as toys used at school. Only 4% thought toys at home were safer. Combining the analysis of the two questions, it is clear that about 76% of the teachers felt they are able to evaluate the toys children use at home by the ones they bring to school with them. Specific descriptions of why the home toys were rated more dangerous (47%) than the ones at school (4%) were not given.

The next four questions are abo. information on toy safety. A total of 94% of the teachers felt that such information would be important to them. One teacher did not answer; two replied "no." A similar percentage held for teachers' reporting that parents need safety information: 96% answered "yes." Two said "no," but one of these qualified the answer by also saying "sometimes." Comparing the two sets of responses it is interesting to note that one respondent indicated she (a teacher) did not need toy safety information, but that the parents did.

The teachers were then asked to choose the format they preferred for receiving information about toy safety: pamphlets, training sessions, other. Since they could indicate more than one preference, training sessions were chosen by all respondents, pamphlets by roughly half. Three participants wanted films and two wanted demonstrations.

When teacher were asked if they felt toy makers know enough about children to make safe toys, 44% of the respondents had no opinion! However, 21% felt toy makers did know enough, and 35% felt they did not. Teachers cited the following reasons for believing that toy makers do know enough to make safe toys:

- They know how they're used. But they don't care-all they want is money.
- Toy makers make toys appropriate to different age levels.
- They test them out first.
- They know what children can do with toys so they are made so.

And these reasons for believing that toy makers do not know enough to make safe toys:

- More interested in what person with buying power will buy.
- Interested in selling, money is all important.
- Concern for money only.
- Because they could at least consider probabilities.
- They make to sell only.
- Majority are not trained, make a lot of small toys children could swallow.
- If they knew accidents would not happen.

Interestingly, the theme of the toy makers' being more interested in money than in child safety occurs in both sets of answers.

Of the 44 responses to the query about being able to check toys out of a library for free, 70% responded positively, 11% negatively, and 18% had no opinion. The reasons cited for wanting access to a toy library repeated the themes of educational value, variety and cost-effectiveness. Reasons cited for not wanting such a library were concerned with being able to return toys unbroken and sanitation.

The final question on the survey had to do with whether or not the teachers had children of their own: 58% did, 42% did not. A total of 52 children were reported. They ranged in age from 2 months old to 22 years old, with an average age of 6.77 years.

APPENDIX A

IV. C. TESTING FOR INDEPENDENCE BETWEEN TWO VARIABLES:

CHI - SQUARE TESTS

Purpose: To analyze variables isolated through Toy Safety Survey to find out if they are statistically independent. This procedure will help in the preparation of additional statistical tests.

Definition: Two population characteristics A, B are <u>independent</u> if the proportion of the population having any particular attribute of A is the same in the total population as it is in the part of the population having a particular attribute of B, no matter what attributes are considered.[1]

Testing Procedure: In a population where the true frequencies are unknown, a sample population may be examined, using hypothesis testing for independence. The following hypothesis are formulated:

H_0 : The Null hypothesis; the factors are <u>independent</u> of one another

H_1 : The Alternate hypothesis; the factors are dependent

Next, the actual (observed) frequencies of the sample factors are compared to expected (calculated) frequencies of the sample. The expected frequencies represent average sample results which would be obtained if the H_0 were true. Contingency tables are then constructed to find the Chi-Square test statistic. The statistic is representative of the sum of all values in the table of actual frequency minus expected frequency squared divided by the expected frequency.

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[1]Lapin, Lawrence, Statistics for Business Decisions, Harcourt Brace Tovarich, Inc., Chicago, 1973.

The Chi-Square test statistic measures the deviation between actual and expected results, with a sampling distribution which allows for computations to determine the Type I error probability (α).

In the toy survey sample, two variables were analyzed to determine independence at a .05 level of significance. This means that if two factors are determined to be independent of one another, about 5 percent of the sample results will not support this relation. Also, if two factors are determined to be dependent, about 5 percent of the sample results will not support this relation. The degrees of freedom used in the comparisons is determined by: (Number of rows - 1) times (the Number of columns - 1), which in the first significance test of $\alpha = .05$ is equal to one degree of freedom. As the degrees of freedom increase in Chi-squared distributions, the Chi-Square approaches the normal distribution. Therefore, a second test was conducted where the degrees of freedom was equal to three, testing the independence of variables at a level significance of $\alpha = .01$.

Both tests of significance led to similar conclusions. The change in the level of significance did not alter the decision to accept or reject the null hypothesis. Overall, the results showed that out of the factors selected, only a few were dependent. The results show their relationships.

Variables selected:

1. Whether or not the respondents had children
2. Whether or not the respondents were educated above the level of High School or the G.E.D.
3. Whether or not the respondents answered the question Number 12 on the Toy Survey: List Problems With Toys you Consider Important.

4. Whether or not the respondents answered the question Number 14 on the Toy Survey: In your opinion, what is (are) the main cause(s) of toy accidents?

These variables were selected to discover if they were independently or dependently associated. The main question to be addressed concerned the relationship that having children had to the frequency of answers to questions Number 12 and 14 on the Toy Survey, also looking at the relationship that higher educational levels had to the frequency of answers to the questions. The independence of these two variables was tested as it related to the answering of the questions. (Predictions before the Chi-Square test was implemented were that the answering of questions was dependent on each variable, Children, and higher educational levels.) The reasoning behind that test was that teachers with children of their own would have stronger opinions, thus more frequently answering the questions. Also, that the higher level of education would influence the teacher's knowledge and opinions, thus accounting for frequent answers.

The Chi-Square tests showed only the second prediction (about higher education levels) to be true.

The Decision Rule will be:		For Table 6 also:	
Accept H_0 if $X^2 \leq$	3.841 ($X^2.05$) &	Accept H_0 if $X^2 \leq$	11.345 ($X^2.01$)
Reject H_0 if $X^2 >$	3.841	Reject H_0 if $X^2 >$	11.345

TABLE 1

CHI - SQUARE TEST: LEVEL OF EDUCATION

VARIABLE AND RESPONDENTS WITH AND WITHOUT CHILDREN

VARIABLES COMPARED FOR INDEPENDENCE

LEVEL OF EDUCATION

Children	AVERAGE LEVEL	HIGHER LEVEL	Totals
YES	A) 11 - Actual 12 - Expected	B) 13 - Actual 12 - Expected	24
NO	C) 12 - Actual 11 - Expected	D) 9 - Actual 10 - Expected	21
TOTALS	23	22	45

Chi - Square
Test Statistic: $X^2 = .09$

*Therefore: $X^2 \leq 3.841$, so the Null hypothesis is accepted and the variables are Independent of one another.

*See Table for calculations.

TABLE 2

CHI - SQUARE TEST: LEVEL OF EDUCATION

VARIABLE AND NUMBER ANSWERING QUESTION 12

LEVEL OF EDUCATION

NUMBER ANSWERING QUESTION 12	AVERAGE LEVEL	HIGHER LEVEL	Totals
Yes	A) 5 - Actual, 9 - Expected	B) 12 - Actual, 8 - Expected	17
No	C) 20 - Actual, 16 - Expected	D) 11 - Actual, 15 - Expected	31
TOTALS	25	23	48

Chi - Square Test Statistic: $X^2 = 4.56$

*Therefore: $X^2 > 3.841$, so the Null Hypothesis is rejected and the variables are dependent on one another.

*See Table 7 for calculations.

TABLE 3

CHI - SQUARE TEST: LEVEL OF EDUCATION

VARIABLE AND NUMBER ANSWERING QUESTION 14

NUMBER ANSWERING QUESTION 14	LEVEL OF EDUCATION: AVERAGE LEVEL	HIGHER LEVEL	TOTALS
YES	A) 12 - Actual 16 - Expected	B) 19 - Actual 15 - Expected	30
NO	C) 13 - Actual 9 - Expected	D) 4 - Actual 8 - Expected	16
TOTALS	25	21	46

Chi-Square Test Statistic: $X^2 = 4.56$

*Therefore: $X^2 > 3.841$, so the Null Hypothesis is rejected and the variables are dependent on one another.

*See Table 7 for calculations.

TABLE 4

CHI - SQUARE TEST: CHILDREN

VARIABLE AND NUMBER ANSWERING QUESTION 12

RESPONDENTS HAVING CHILDREN

NUMBER ANSWERING QUESTION 12	YES	NO	TOTALS
YES	A) 9 - Actual 9 - Expected	B) 7 - Actual 7 - Expected	16
NO	C) 16 - Actual 16 - Expected	D) 14 - Actual 14 - Expected	30
TOTALS	25	21	46

Chi-Square Test Statistic: $X^2 = -.11$

*Therefore: $X^2 \leq 3.841$, so the Null Hypothesis is accepted and the variables are Independent of one another.

*See Calculation on Table 7

TABLE 5

CHI - SQUARE TEST: CHILDREN

VARIABLE AND NUMBER ANSWERING QUESTION 14

RESPONDENTS HAVING CHILDREN

NUMBER ANSWERING QUESTION 14	YES	NO	TOTALS
YES	A) 18 - Actual 16 - Expected	B) 12 - Actual 14 - Expected	30
NO	C) 7 - Actual 9 - Expected	D) 9 - Actual 7 - Expected	16
TOTALS	25	21	46

Chi-Square Test Statistic: $X^2 = .86$

*Therefore: $X^2 \leq 3.841$, so the Null Hypothesis is accepted and the variables are Independent of one another.

*See Calculations on Table 7

TABLE 6

CHI - SQUARE TEST: LEVEL OF EDUCATION

VARIABLE AND COMBINED ANSWERS TO QUESTIONS 12 AND 14

LEVEL OF EDUCATION

NUMBER ANSWERING QUESTION 12	AVERAGE LEVEL	HIGHER LEVEL	TOTALS
YES	A) 5 - Actual 9 - Expected	B) 12 - Actual 8 - Expected	17
NO	C) 20 - Actual 16 - Expected	D) 11 - Actual 15 - Expected	31
NUMBER ANSWERING QUESTION 14 YES	E) 12 - Actual 16 - Expected	F) 19 - Actual 15 - Expected	31
NO	G) 13 - Actual 9 - Expected	H) 5 - Actual 8 - Expected	17
TOTALS	50	46	96

Chi-Square Test Statistic: $X^2 = 11.69$

*Therefore: $X^2 > 11.345$, so the Null Hypothesis is rejected and the variables are dependent on one another.

*See Calculations on Table 7.

TABLE 7

CALCULATIONS FORMULA:

FOR: TABLES 1 - 5

$$X^2 = \sum \text{ of all cells } \frac{((|\text{Actual} - \text{Expected}|) - .5)^2}{\text{Expected}} \text{ Values}$$

FOR: TABLE 6

$$X^2 = \sum \text{ of all cells } \frac{(\text{Actual} - \text{Expected})^2}{\text{Expected}} \text{ Values}$$

CONCLUSIONS FROM CHI-SQUARE TESTS OF INDEPENDENCE:

The following are proven under a .05 level of significance; meaning they have a 95% confidence interval:

1) The Level of Education and Children Variables were Independent
2) The Level of Education and Number Answering Question 12 were Dependent variables
3) The Level of Education and Number Answering Question 14 were Dependent variables
4) The Children and Number Answering Question 12 were Independent
5) The Children and Number Answering Question 14 were Independent

The following is proven under a .01 level of significance; meaning a 99% confidence interval exists:

- The Level of Education and the Number Answering Question 12 or the Number Answering Question 14 are Dependent variables.

The conclusion is that the greater the level of education, the more answers received from both questions 12 and 14. These two factors are dependent; they vary together. Other relationships between variables were not examined. However, this indicates that education does influence the answers to the questions studied. This supports the original prediction, possibly indicating that education causes awareness and stronger opinions about toy safety.