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ABSTRACT

This study explores whether the installation of an electronic theft detection device has an effect on the library user's attitudes about booktheft and examines opinions and attitudes on booktheft motivations and potential solutions to the problem. Basic questions posed by the study are: Do the same pressures exist for the whole user population? Are the most significant variables affecting booktheft internal or external to the library, or both? If both, how do these variables interact? The theoretical framework of the research isolates five major factors possibly contributing to a high rate of booktheft: the library, academic pressure, individual personality, social and psychological pressures, and general criminal framework of theft. This report discusses (1) the development of a questionnaire to explore library users' booktheft attitudes and to obtain background information about library users and the sub-population of book thieves; (2) questionnaire distribution at two comparable academic libraries before and after one installed an electronic booktheft detection device; (3) comparison of library inventory figures before and after that installation; (4) statistical manipulation of survey information; and (5) analysis of results. Appendices include the annotated survey instrument and crosstabulations of significant questions between samples. (Author/JD)

PRELIMINARY REPORT

ON

BOOK LOSSES IN LIBRARIES

A PILOT OPINION SURVEY

by

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Susan L. Miller

June 1977

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INTRODUCTION

The purpose of this study is to determine the effect of the installation of an electronic theft detection device on the attitudes which library users have about booktheft. The subject of the study is the user of the academic library and the goal is to begin to outline opinions and attitudes about why people steal books and possible solutions to the book theft problem. The study is exploratory rather than a testing of specific hypotheses. General questions posed by the study are: do the same pressures exist for the whole user population, eg., does everyone have class assignments which require the use of a library's limited resources? Are the most significant factors affecting book theft inside or outside the library, or both? If both, how do the factors interact? Of various possible solutions, which is likely to be most effective? More specifically, what do self-admitted book thieves think about book theft, and were there any changes in attitude in users of a library after a theft detection system was installed?

The theoretical framework of the study distinguished five factors (with variables within each factor) which possibly contribute to a high rate of book theft: the library, academic pressure, individual personality, social and psychological pressures, and the general criminal framework of theft.

The library factor included such items as insufficient copies of highly desirable books, circulation restrictions, availability of copy machines, fine rates, and book selection policies. The variables within the academic dimension include academic pressure to succeed, class assignment requirements on a limited collection, and the pressure of scholastic achievement in association with freedom of access to persons who are not permitted to borrow. The factor of individual personality is exemplified by the desire to own. Variables within the social and psychological factor include inadequate personal funds to

purchase desired books, peer group pressure, revolt against large organizations, or a rebellious act to assert individuality. Finally, the general criminal framework of theft includes such considerations as whether or not the behavior is systematic and habitual, or premeditated rather than spontaneous; is the definition of book theft one in which the behavior is not considered as seriously deviant or illegal; and is it the user's opinion that the librarian does not view book theft within the criminal context of such words as "steal", "theft", "deviant".

The basic research plan was: (1) the development of a questionnaire to elicit the library users' attitudes about book theft and to obtain background information about the population of library users (including the sub-population of book thieves). Each group of variables is given equal emphasis in the construction of the questionnaire; i.e., the variables within each factor are tested to determine if any is more important than the other, and each factor is compared to the other factors. (2) the distribution of the questionnaire at two department libraries of about the same size (Commerce and Biological Sciences) both before and after the Commerce Library installed Checkpoint, an electronic book theft detection device. The Commerce library was the experiment library and Biological Sciences the control library. (3) the input of additional information gathered as a result of the two inventories of the Commerce Library, one before and one after the installation of Checkpoint at that library. (4) the coding and keypunching of questionnaire answers for manipulation by canned computer statistics programs. (5) the analysis of the statistical results.

The study began September 1973. The questionnaires were distributed beginning January, 1974. During the course of the study, the researchers advised an undergraduate honors student in the development of a spin-off

project which has been reported elsewhere. This information is submitted as preliminary findings which are being analyzed, and which will be reported shortly.

METHODOLOGY

Experimental Model

The experimental model used in this study was the Pretest-Posttest Control Group Design (Campbell and Stanley, 1963). This procedure compares the effects of a single experimental event with the non-occurrence of that experimental event, testing before and after that event has occurred. This methodology calls for equivalent (experimental and control) samples chosen randomly. The Sample Description section records how this was achieved for this survey. According to the model, test sessions were run simultaneously at randomized times to equalize external variables not of direct concern.

Sample

Since the model calls for experimental and control groups, major sample divisions were made according to two department libraries in a large University system. The experimental library was the site of the theft detection device installation. For the control situation, the department library chosen was of comparable size and circulation volume, but with no theft detection device. The clientele of each library were multidisciplinary (social sciences in the experimental situation, life sicences in the control situation) but of sufficient physical and subject distance that potential survey respondents would not overlap.

One thousand fifty-eight library patrons comprised the sample. Of this number, 58.9% were in the experimental group (30%, Time I; 27.9%, Time II), and 41.9% were in the control group (21.7%, Time I; 20.2%, Time II). Further analysis evinced representation from 72 departments or colleges of the University. Exmination of status revealed the following sample composition: freshmen, 2.4%; sophomores, 6.4%; juniors, 18.4%; seniors, 37.1%; graduate students, 28.1%; faculty, 1.9%; and other (unspecified) categories, 5.6%. In addition, 73% of the participants were men and 26.7% were women.*

Instrumentation

The questionnaire was chosen as the measuring device for ease in gathering a large amount of data and to facilitate study replication. The prototype questions were drawn from multidisciplinary background readings. These potential items were then grouped into the hypothesized five factors of variables or theft causes supported by the literature. Relevant references (see bibliography) were studied for question construction and arrangement on analysis. Major concerns were the type of information to be obtained and the meaning of individual questions for the potential respondents. The questionnaire was altered to reflect these suggestions.

The pilot survey was presented to 25 library employees who were encouraged to record problems and suggested changes on the instrument. These changes were incorporated and the revised pilot given to the same 25 employees, plus a freshman English class of 20 students. Their recommendations in item wording were added to format changes proposed by the book theft researchers and the resulting instrument distributed to the experimental and control samples in the Time I period. Time II survey distribution used the same instrument, with one modification; an added item at the conclusion queried respondents whether their participation was initial or a repetition of the pretest (Time I).

Questions were of the closed-type with an "other" option, allowing open-ended responses. Question style was primarily forced choice with some multiple options. Items were arranged in sequences with a logical progression, and some questions were designed to be answered in tandem. Nominal level data were gathered for ease in coding and as a deterrent to respondent pattern establishment in answer sequence.

Questionnaires were distributed simultaneously to every library patron in experimental and control libraries at forty-four randomly chosen times for one-week periods in each of two years. The first week of distribution

(Time 1), occurred just prior to the installation of a theft detection device (experimental event). In order to examine the affects of exposure to the device, the second distribution week (Time 2) was scheduled one year after installation and continuous use of the theft detector. Questionnaire return was via the honor system with collection boxes placed strategically in each library.

Methods of Analysis

The researchers compiled a bibliography of current resources on book theft and white collar crime, for comparison with the findings of the present study. In addition, annual profiles of both the experimental and control libraries for both survey years were obtained for further data interpretation.

Members of the research team reviewed questions assigned to each of the hypothesized factors. This information was used to annotate a copy of the survey instrument (see Appendix A).

Questionnaire responses were coded and computer analyzed using the Statistical Package for the Social Sciences (SPSS). Following first computer runs, key-stroke errors falling outside the acceptable responses were corrected where possible and revised computer runs were made for all selected sets of data.

Frequencies were obtained for questions in each of the four samples, and for total responses to questions in the combined four samples. The survey instrument was then annotated with these frequencies to aid the researchers in identifying questions displaying attitudes toward the theft detection device.

Significance Tests

Because of the nominal nature of the data and information desired, the SPSS Crosstabulations Program was employed. By this methodology, the cross-tabulations would display a joing frequency distribution of cases on two or more of the variables. These distributions could then be statistically analyzed

by certain tests of significance such as the chi square (χ^2) statistic.

Crosstabulations were found for all variables between the paired samples and among all samples. In addition, crosstabulations within each sample and the combined samples for Question 28 (Do your friends take books without checking them out?) and Question 35 (Have you ever taken a book without checking it out?) were obtained for selected sets of data. Those items tested by χ^2 and yielding a significance of $p \leq .05$ (where p=probability ratio) were analyzed more extensively according to the SPSS guidelines for cell identification and interpretation. (See Appendix C for the questions which attained this significance level in the analysis.)

Additional Analysis

Since the researchers were interested in library factors perceived by the respondents to influence book theft, those questions labeled as library-related and appearing significant in the acceptable range, $p \leq .05$, were examined in still greater depth. Also, a comparison was made of the attitudes among thieves and non-thieves regarding the reasons behind the book stealing act; the most effective counter activities; and changes in the attitudes after the installation of Checkpoint.

In addition, rankings by selected questions were prepared for analyses by the research team: library factors causing book theft (Question 19); perceptions (Question 8); social factors causing book theft (Question 21); school factors causing book theft (Question 25); librarians' statements about book theft (Question 26); objective factors (Question 27); subjective factors (Question 34); general attitudes about book loss (Question 38); methods effective in stopping book theft (Question 42); potential solutions (Question 43).

Footnotes

* Any percentage discrepancies (i.e. not always totalling exactly 100) may be explained by figure roundings and missing sample responses for particular questions.

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APPENDIX A

Annotated Survey Instrument

THE OHIO STATE UNIVERSITY LIBRARIES
Circulation Desk, Main Library
1858 Neil Avenue Mall

BOOK LOSSES IN LIBRARIES - A PILOT OPINION SURVEY
WINTER QUARTER, 1974

Please don't put your name on this paper. The results of the survey will be used for statistical purposes only. You may return this questionnaire to the surveyor, the desk in the Biological Sciences Library, or the desk in any other Departmental Library, or the Circulation Desk, Main Library.

1. Name of College or Department _____

TOTAL	COM '74	BOS '74	COM '75	BOS '75	College or Department Code Numbers
132	17	49	30	36	01= College of Arts and Sciences
302	151	0	149	2	02= College of Administrative Science
14	6	2	4	2	03= Graduate School (College)
24	9	7	5	3	04= Division of Continuing Education (College)
22	7	5	4	6	05= Non-OSU Student or other, alumni
46	4	20	7	15	06= College of Agriculture
5	3	0	2	0	07= College of Engineering
7	6	0	1	0	08= Department of Sociology
11	5	1	5	0	09= Department of Accounting
2	1	0	1	0	10= Department of Management Science
22	15	0	7	0	11= Department of Economics
14	9	1	4	0	12= Department of Geography
2	2	0	0	0	13= Department of Finance
2	1	0	1	0	14= Department of Indus. & Sys. Engr.
6	1	1	4	0	15= Department of History
9	6	0	3	0	16= Division of Public Administration
4	1	3	0	0	17= Department of Chemistry
10	10	0	0	0	20= Department of Chemical Engineering
7	5	0	2	0	21= Department of Political Science
6	4	0	2	0	22= Department of Psychology
9	3	0	6	0	23= Commerce Library
22	9	1	12	0	25= School of Home Economics
1	1	0	0	0	26= Dept of Early and Mid. Ch. Educ.
5	2	0	3	0	27= Dept. of Agricultural Econ and Rural Soc.
10	6	1	2	1	28= College of Education
39	15	4	11	9	29= University College
3	2	0	1	0	31= Department of City & Regional Planning
2	1	0	1	0	32= Department of Educational Dvlpt
1	1	0	0	0	33= Department of Ceramics Engineering
6	2	0	2	2	34= School of Journalism
19	0	12	0	7	35= Department of Microbiology
53	2	14	5	32	36= School of Natural Resources
22	0	11	0	11	37= Department of Botany
69	0	36	1	32	38= Department of Zoology
1	0	1	0	0	39= Department of Physiological Chemistry
6	0	3	0	3	40= Department of Genetics
6	0	3	0	3	41= Department of Agronomy
20	0	16	0	4	42= College of Biological Science
3	0	1	0	2	43= Division of Landscape Horticulture
17	0	5	2	10	44= Department of Entomology
1	1	0	0	0	45= "Medical"
7	0	5	0	2	46= Department of Plant Pathology

TOTAL	COM '74	BOS '74	COM '75	BOS '75		COLLEGE OR DEPARTMENT CODE NUMBERS
8	0	4	0	4	47=	Division of Biology
8	1	4	1	2	48=	Department of Horticulture
4	0	1	0	3	49=	Department of Agricultural Education
4	2	1	0	1	50=	School of Social Work
4	0	1	1	2	51=	Division of Dental Hygiene
7	0	5	1	1	52=	School of Allied Medical Professions
2	0	1	0	1	53=	Department of Biophysics
2	0	1	0	1	54=	Department of Animal Science
1	0	1	0	0	55=	Department of Poultry
2	1	1	0	0	56=	Department of Physics
2	0	2	0	0	57=	Department of Dairy Science
1	1	0	0	0	58=	Department of Civil Engineering
2	1	0	1	0	59=	Division of Physical Education
2	0	1	1	0	60=	Department of Sci-Math Education
1	1	0	0	0	61=	College of Dentistry
1	0	1	0	0	62=	Department of Dance
4	0	1	1	2	63=	Department of Anthropology
2	1	0	1	0	64=	College of Law
2	0	1	0	1	65=	School of Nursing
2	1	0	1	0	66=	Div. of Hospital and Health Services Adm.
3	1	0	2	0	67=	Department of Computer and Info Science
1	0	0	0	1	68=	Inst. of Polar Studies
4	0	0	0	4	69=	College of Pharmacy
1	0	0	0	1	70=	Physiology
1	0	0	0	1	71=	Botany and Zoology
1	0	0	0	1	72=	Geology
1	0	0	0	1	73=	Developmental Biology
1	0	0	0	1	74=	Pathology
1	0	0	0	1	75=	Biosciences Library
3	0	0	0	3	76=	Environmental Biology
1047	318	228	287	214		

Responses to the following questions indicate the factors, number of respondents (N) checking answers, and the per cent (%) of total respondents. The factors

A = Academic factors
C = Criminal factors
D = Demographic information
I = Individual, personal factors
L = Library factors
S = Social factors
T = Test question

FACTOR	N	(%)	
			2. Please check status:
D	25	(2.4)	a. Freshman
D	68	(6.4)	b. Sophomore
D	195	(18.4)	c. Junior
D	393	(37.1)	d. Senior
D	297	(28.1)	e. Graduate School
D	20	(1.9)	f. Faculty
D	59	(5.6)	g. Other; please specify
			3. Sex:
D	772	(73.0)	a. Male
D	283	(26.7)	b. Female
			4. About how many times do you use the library:
D	15	(1.4)	a. Never
D	351	(33.2)	b. 1 per week
D	92	(8.7)	c. 1 per month
D	197	(18.6)	d. Other; please specify
D	389	(36.8)	e. More than 1 per week
			5. Have you had assignments which directed you to use the library:
A	919	(86.9)	a. Yes
A	127	(12.0)	b. No
			6. If you have had such assignments, did they:
A	305	(28.8)	a. Have a reading list with books from the library included?
A	109	(10.3)	b. Have no reading list and left the choice of books to you.
A	502	(47.4)	c. Both
			7. Does the library collection have enough books and magazines to complete class assignments?
L	640	(60.5)	a. Yes
L	182	(17.2)	b. No
L	161	(15.2)	c. Undecided
			8. Please check any of the following which are true:
L	97	(9.2)	a. Books do not circulate for a long enough time
L	15	(1.4)	b. Cannot borrow enough books at a single time
L	23	(2.2)	c. Cannot renew books
L	19	(1.8)	d. Can only renew books one time
L	163	(15.4)	e. Cannot check out magazines
L	275	(26.0)	f. Books which are needed do not circulate
L	136	(12.9)	g. Other; please specify

FACTOR	N	(%)		
			9.	What is the main use you make of the library?
D	10	(0.9)		a. Leisure reading books
D	162	(15.3)		b. Class assignment books
D	178	(16.8)		c. Study hall
D	604	(57.1)		d. All/more than 1 of the above
D	101	(9.5)		e. Other; please specify
			10.	How many books do you check out of the library?
D	250	(23.6)		a. None
D	254	(24.0)		b. 1 per week
D	337	(31.9)		c. 1 per month
D	207	(19.6)		d. Other; please specify
			11.	Do you use any other libraries?
D	798	(75.4)		a. Yes
D	252	(23.8)		b. No
			12.	If yes, what sort of library was it?
D	177	(16.7)		a. Public Library
D	449	(42.4)		b. Other College/University Library
D	28	(2.6)		c. Other; please specify
D	135	(12.8)		d. Both a and b above
			13.	Please check any of the following books which you have read:
T	435	(41.1)		a. Jonathan Livingston Seagull
T	25	(2.4)		b. Return of Atlantis
T	65	(6.1)		c. Go Ask Alice
T	5	(0.5)		d. The Goat-Footed God
T	199	(18.8)		e. Body Language
			14.	Does the library have photocopying machines for public use?
L	998	(94.3)		a. Yes
L	13	(1.2)		b. No
L	38	(3.6)		c. Don't know
			14a.	If the library does have photocopying machines, please check any of the following which are true:
L	318	(30.1)		a. The machines are not kept in good repair
L	324	(30.6)		b. Too expensive to copy long articles
L	392	(37.1)		c. The quality of the reproductions is bad
L	127	(12.0)		d. Other: please specify

FACTOR	N	(%)	
			15. Does the library have a formal or written policy stating disciplinary measures and penalties for those who take books?
L/C	406	(38.4)	a. Yes
L/C	78	7.4	b. No
L/C	561	(53.0)	c. Don't know
			16. Do you think that book losses are a serious problem in your library?
L/C	637	(60.2)	a. Yes
L/C	56	(5.3)	b. No
L/C	359	(33.9)	c. Don't know
			17. What is the worst result of the loss of library materials which have not been properly checked out:
S/L/C	52	(4.9)	a. Loss in terms of money
S/L/C	826	(78.1)	b. Depriving other borrowers of the use of material
S/L/C	18	(1.7)	c. Other; please specify
S/L/C	143	(13.5)	d. More than 1 above
			18a. Do you think that removing a book from the library without having it properly checked out violates any moral code or standard?
S/C	430	(87.9)	a. Yes
S/C	51	(4.8)	b. No
S/C	66	(6.2)	c. Undecided
			18b. Would you define the act as illegal?
C	836	(79.0)	a. Yes
C	114	(10.8)	b. No
C	97	(9.2)	c. Undecided
			18c. Is it a form of larceny for which a person could be prosecuted? Larceny is defined as "the unlawful taking away of another's property without his consent and with the intention of depriving him of it"?
C	729	(68.9)	a. Yes
C	146	(13.8)	b. No
C	166	(15.7)	c. Undecided
			19. There may be many factors in the library which cause a person to take books without properly checking them out. Please check any of the following which are true:
L	540	(51.0)	a. Not enough copies in high demand
L	436	(41.2)	b. Circulation restrictions
L	154	(14.6)	c. No photocopy machines available
L	42	(4.0)	d. Not enough books in a really interesting area such as astrology
L	43	(4.1)	e. Library policies are formulated for librarians

FACTOR	N	(%)	
			not for students
L	99	(9.4)	f. The fine rates are too high
L	75	(7.1)	g. It takes too long to check out books
L	77	(7.3)	h. Don't know how to check out a book
L	194	(18.3)	i. Other
			20. Please estimate how many books are taken each year without being checked out properly:
L/C/T	424	(40.1)	a. 1 out of 100
L/C/T	539	(50.9)	b. 15 out of 100
L/C/T	33	(3.1)	c. Other
			21. There may be many social factors which cause a person to take books without properly checking them out. Check any of the following which are true:
S	475	(44.9)	a. Not enough money to buy desired books
S	77	(7.3)	b. Take books to be part of group or to gain status
S	194	(18.3)	c. It is OK to take books since they are public property and belong to everyone
S/I	235	(22.2)	d. It is a challenge
S	221	(20.9)	e. Other: please specify
			22. Please estimate about how much the average book costs:
L/C/T	100	(9.5)	a. $3.00
L/C/T	881	(83.3)	b. $15.00
L/C/T	40	(3.8)	c. Other
			23. There may be factors about the library which cause a person to take books without checking them out properly. Please check any of the following which are true:
A	765	(72.3)	a. Teachers give assignments which require everyone to use the same material
A	353	(33.4)	b. Pressure to get good grades
A/S	68	(6.4)	c. School is a drag and taking books is a form of rebellion
A/S	49	(4.6)	d. Rules are designed for school administration, not for students
	90	(8.5)	e. Other: please specify
			24. Please estimate about how much it costs the library to process a replacement copy of a book which has been taken:
L/C	215	(20.3)	a. $2.00
L/C	783	(74.0)	b. $12.00
L/C	22	(2.1)	c. Other

FACTOR	N	(%)	
			25. There may be factors in an individual's make-up which cause him/her to take books without properly charging them out. Check any of the following which are true:
I	317	(30.0)	a. Wants to own the book itself rather than the information in it
I	518	(49.0)	b. Wants to add books to personal collection
I	720	(68.1)	c. Wants to have books handy for future reference
S	134	(12.7)	d. Form of rebellion
S	42	(4.0)	e. Thinks it will help him/her to be part of the group
S	326	(30.8)	f. Does not think it is a wrong kind of behavior
S	113	(10.7)	g. Parents want good grades and taking the books helps to accomplish that
	71	(6.7)	h. Other; please specify
			26. Which of the following statements do you think your librarian would make about books which are taken without being properly checked out?
L/C	24	(2.3)	a. It is not a serious problem. People take the books, but always return them eventually
A	120	(11.3)	b. If students do take books it is the fault of their teachers who give everyone the same assignment and do not check to see if the library has enough books to go around
L/C	903	(85.3)	c. This is a very serious problem. It is dishonest to take books and deprives everyone of their use
L	422	(39.9)	d. I would like to buy more copies of popular books, but the library budget is not large enough
	16	(1.5)	e. Other
			27 Please check one of the following to indicate which is the most likely reason for students to take books without properly charging them out:
L	488	(46.1)	a. Library factors; for example, not enough books in high demand or circulation restrictions
S	57	(5.4)	b. Social factors; for example, a challenge or to gain status
A	326	(30.8)	c. School factors; for example, class assignments or academic pressure
I	444	(42.0)	d. Individual make-up; for example, wants to own books or have them for future reference
	41	(3.9)	e. Other please specify

FACTOR	N	(%)	
			28. Do any of your friends take books without properly checking them out?
D	194	(18.3)	a. Yes
D	287	(27.1)	b. No
D	558	(52.7)	c. Don't know
			29. If they do take books, what sort of books are taken?
D	109	(10.3)	a. Reference Book
D	69	(6.5)	b. Reserve Book
D	70	(6.6)	c. General Circulating Book
D	30	(2.8)	d. Recreational Reading
D	5	(0.5)	e. Other; please specify
			30. Are the books returned eventually?
D	85	(8.0)	a. Yes
D	27	(2.6)	b. No
D	72	(6.8)	c. Sometimes
D	10	(0.9)	d. Don't know
			31. Do you think students continue to take books without checking them out properly once they have started?
I/C	648	(61.2)	a. Yes
I/C	42	(4.0)	b. No
I/C	319	(30.2)	c. Don't know
			32. If you were in the library and observed a fellow student leaving with a book which you knew was not checked out, would you report that fact to the librarian?
C	296	(28.0)	a. Yes
C	366	(34.6)	b. No
C	371	(35.1)	c. Don't know
			33. Would you approach the person and remind him/her to check out the book?
I/C/S	297	(28.1)	a. Yes
I/C/S	423	(40.0)	b. No
I/C/S	318	(30.1)	c. Don't know
			34. If you were going to take a book without properly checking it out, which of the following would be the most likely cause?
L	444	(42.0)	a. Library factors: for example, not enough copies of books in high demand or circulation restrictions

FACTOR	N	(%)	
S	15	(1.4)	b. Social factors; for example, a challenge or to gain status
I	231	(21.8)	c. Individual make-up; for example, wants to own books or have them for future reference
A	333	(31.5)	d. School factors; for example, class assignments or academic pressure
	105	(9.9)	e. Other; please specify

35. Have you ever taken a book from a library without checking it out properly?

D	237	(22.4)	a. Yes
D	803	(75.9)	b. No

36. Did you eventually return it to the library?

D	190	(18.0)	a. Yes
D	34	(3.2)	b. No
D	6	(0.6)	c. Don't know

37. What sort of book(s) was it? (Check any which apply)

D	105	(9.9)	a. Reference Book
D	40	(3.8)	b. Reserve Book
D	94	(8.9)	c. General Circulating Book
D	32	(3.0)	d. Recreational Reading
D	22	(2.1)	e. Other: please specify

38. People in general may have certain attitudes about book loss which could be important in stopping the taking of books which have not been properly checked out. Please check any of the following which are true:

S/C	599	(56.6)	a. A student who takes books does not think that the behavior is abnormal
S/C	507	(47.9)	b. A student who takes books does not think that the behavior is illegal
S/C	143	(13.5)	c. The librarian does not speak of book loss in terms such as dishonesty or theft
S/C	486	(45.9)	d. The student's friends do not speak of book loss in terms such as dishonesty or theft
S/C	385	(36.4)	e. The student's friends do not think that the behavior is abnormal
S/C	342	(32.3)	f. A student who takes books does not feel there is anything particularly wrong since public officials in government and big business gain large sums through illegal means
	86	(8.1)	g. Other; please specify

FACTOR	N	(%)	
			39. Is it desirable to attempt to identify and stop a student who takes books from the library without checking them out properly:
C	768	(74.3)	a. Yes
C	100	(9.5)	b. No
C	120	(11.3)	c. Don't know
C	21	(2.0)	d. Other
			40. Should such students be punished in any way?
C	604	(57.1)	a. Yes
C	96	(9.1)	b. No
C	285	(26.9)	c. Undecided
C	51	(4.8)	d. Other; please specify
			41. Would there be less book loss if penalties were heavier?
C	427	(40.4)	a. Yes
C	327	(30.9)	b. No
C	283	(26.7)	c. Undecided
			41a. Would there be less book loss if students knew there was stricter surveillance over books leaving the library?
C	846	(80.0)	a. Yes
C	78	(7.4)	b. No
C	114	(10.8)	c. Don't know
			42. Please check one of the following methods which would be most effective in stopping a person from taking books which are not properly checked out from the library.
L	165	(15.6)	a. Publicity campaigns
L	284	(26.8)	b. Exit guards
L	58	(5.5)	c. Student body honor system
L	199	(18.8)	d. Charging desk at entrance to provide visual control
L	679	(64.2)	e. An electronic system that would give an alarm if anyone tried to leave without properly checking out a book
	58	(5.5)	f. Other; please specify
			43. How might the book loss problem be solved?
A	120	(11.3)	a. Change the school pressures
L	260	(24.6)	b. Change the library policies
C	347	(32.8)	c. Publicize the fact that it was wrong and illegal to take books
C	579	(54.7)	d. Identify and stop those people who do it
	107	(10.1)	e. Other: please specify

FACTOR	N	(%)	
			44. Librarians have proposed two ways they could handle the book problem. Please check which one you think would work best:
L	578	(54.6)	a. Concentrate on preventing books from being taken
L	342	(32.3)	b. Use loss as an indicator of areas in which the library needs to improve its service
L	78	(7.4)	c. Both
	7	(0.7)	d. Other
			45. Have you filled out this questionnaire before?
D	31	2.9)	a. Yes
D	468	(44.2)	b. No

APPENDIX B

Significant Questions on

Booktheft Questionnaire

when Crosstabulated between Samples

QUESTION	SAMPLE 1X2	SAMPLE 1X3	SAMPLE 2X4	SAMPLE 3X4	SAMPLES 1X2X3X4
001	0.0			0.0	0.0
2	.0206				.0474
4		0.0	.0000	.0022	0.0
7	.0051				
8E				.0320	.0281
8F				.0339	.0309
11	.0021			.0171	.0010
12		.0533*			
13A				.0256	
13B		.0553*			
14AA	.0017	.0000	.0012		.0000
14AB		.0149	.0519*		.0141
14AC	.0004	.0000	.0000	.0453	.0000
16		.0300	.0344	.0003	.0022
17		.0387			.0385
19C	.0027	.0007			.0008
19E		.0298			
19I	.0483				.0463
20		.0150		.0206	.0366
21E		.0272		---	.0010
22		.0001			.0010
23E				.0577*	
26C		.0530*		.0108	.0359
27C		.0[illegible]6			
29B					.0319
29C	.0259				
29D	.0068				.0020
32			.0238	.0015	.0096
33				.0002	.0027
34A		.0568	.0449		.0183
34E			.0481	.0002	.0008

TABLE 6 : MEANS AND STANDARD DEVIATIONS FOR THE 1970, 1965 and 1955 GRADE 7 SAMPLES (N_{1970} = 1031, N_{1965} = 1147, N_{1955} = 917)

Test	1970		1965		1955		Significance of Difference Between Means
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	
Intelligence Test	104.64	14.24	102.21	12.61	96.26	12.42	$p<.05$
Word Knowledge (10 min)	42.04	14.02	42.96	13.87	44.18	14.51	$p<.05$
Reading for Meaning (Comprehension)	37.80	13.93	35.49	11.33	34.84	10.35	$p<.05$
Addition	44.17	6.96	44.80	5.79	43.62	5.55	$p<.05$
Subtraction	48.03	10.12	49.98	9.87	47.96	8.72	$p<.05$
Multiplication	31.89	5.96	33.22	4.86	32.55	4.94	$p<.05$
Division	31.28	9.25	33.39	8.31	34.37	9.14	$p<.05$
Spelling (Words)	36.52	11.17	43.27	8.14	-	-	$p<.05$
Spelling (Sentences)	26.77	13.06	28.14	11.00	-	-	$p<.05$

Table 6, predictably corroborates the pattern of results evident from an inspection of the median scores. For reasons already discussed the 1960 means could not be tabled. A univariate analysis of variance established that on each test the difference between the largest and smallest year-group mean was statistically significant.

Apart from the mean differences, the relative size of standard deviations is of interest. In every instance the standard deviations of the 1970 sample, irrespective of the size of means, is larger than the standard deviations of the 1965 and 1955 samples. The standard deviation is a measure of dispersion of scores. This means that in the 1970 sample pupil test scores were more widely spread about the mean.

In order to provide a more complete comparison of performance across all four year groups frequency distributions were computed according to the manner adopted in the 1960 survey. The achievement test scores were transformed into Grade Point Averages for this purpose while the intelligence test results were transformed into standardized I.Q. test scores.

QUESTION	SAMPLE 1X2	SAMPLE 1X3	SAMPLE 2X4	SAMPLE 3X4	SAMPLE 1X2X3X4
38B	.0365	.0183		.0289	.0581*
38C				.0166	.0411
38E					.0513*
38G	.0354				.0205
41				.0182	
41A		.0258			
42A		.0004		.0384	.0040
42B		.0002	.0267		.0000
42D		.0030		.0034	.0001
42E	.0088	.0000	.0002	.0000	0.0
42F		.0091		.0576*	.0449
43A		.0054			.0100

DIVISION

Grade Norms	1955	1960	1965	1970
Less than 4.0	3.4	4.1	2.3	4.1
4.0 - 4.9	4.3	5.1	4.5	9.5
5.0 - 5.9	24.7	18.2	23.1	32.07
6.0 - 6.9	20.9	18.9	24.4	21.73
7.0 - 7.9	23.2	20.92	24.8	18.13
More than 7.9	23.4	32.7	20.9	14.52

MULTIPLICATION

Grade Norms	1955	1960	1965	1970
Less than 4.0	2.0	1.5	1.4	2.8
4.0 - 4.9	4.5	4.8	3.8	7.89
5.0 - 5.9	33.8	24.3	20.0	40.0
6.0 - 6.9	24.4	18.3	17.7	18.2
7.0 - 7.9	19.7	24.3	25.2	24.17
More than 7.9	15.6	26.7	32.0	15.7

ADDITION

Grade Norms	1955	1960	1965	1970
Less than 4.0	.9	.4	.6	1.0
4.0 - 4.9	7.7	5.3	4.3	6.1
5.0 - 5.9	20.3	12.7	12.5	19.61
6.0 - 6.9	24.5	17.9	19.3	22.3
7.0 - 7.9	22.2	13.5	24.8	18.6
More than 7.9	24.4	50.2	38.5	32.29

APPENDIX C

Significant Questions on Booktheft Questionnaire when Crosstabulated with Questions 28 and 35

QUESTION	Sample 1		Sample 2		Sample 3		Sample 4		ALL	
	Q.28	Q.35	Q.28	Q.35	Q.28	Q.35	Q.28	Q.35	Q.28	Q.35
2				.0004						
3				.0506*						
7		.0315								
8A	.0209		.0020							
8F			.0448							
8G						.0247				.0419
10						.0048		.0193		.0002
11				.0541*						
12							.0108			
13A	.0296		.0264						.0404	
13B										
14				.0286						
14AA			.0009				.0507*	.0582*	.0003	.0273
14AC	.0128						.0096			
15								.0401		
16	.0037				.0260	.0028			.0014	.0050
17	.0028								.0065	
18A	.0304	.0009				.0284	.0027	.0000	.0000	.0000
18B	.0535*	.0000		.0272		.0028			.0025	.0000
18C	.0093	.0141		.0254				.0063	.0023	.0000
19A	.0150				.0260				.0464	
19B	.0328	.0008				.0001		.0406		.0000
19C	.0500									.0071
19D		.0162								
19E								.0011		.0042
19F			.0071	.0358					.0009	.0516*
19G					.0002					.0229
20	.0008								.0032	
21D		.0582*								.0214
22				.0047	.0[illegible]					.0234
23A					.0260					
23D				.0001			.0448			
23E				.0546*			.0008			
24						.0166				.0051

which each original test score is multiplied, are called discriminant weights or coefficients and these (slightly modified) will be tabled below.

The equation,

$$Y_1 = a_1 X_1 + a_2 X_2 + a_3 X_3 \text{ ------ } a_n X_n$$

is called the discriminant function. Y_1 is a discriminant score, $a_1 \ldots a_n$ are the discriminant weights, and $X_1 \ldots X_n$ are the test scores (X_1 = I.Q., X_2 = Word Knowledge, etc.).

With three groups (such as the 1955, 1965 and 1970 year groups) two functions may usually be extracted. Thus one or two functions may succinctly describe the year group differences where seven tests results were initially used. This is one of the real values of multiple discriminant analysis. By examining the mean discriminant scores for each group (these are known as centroids) and by examining the relative weights assigned to the different variables a deeper understanding of the group differences may be gained.

In the analysis of the 1970, 1965 and 1955 year groups two statistically significant functions were extracted. The chi-square test of significance for discrimination by the first dimension yielded a value of 471.99, significant well beyond the .001 level, while the second dimension, with a chi square value of 74.08, was also significant beyond the .001 level. The first vector (or function) accounted for 87 per cent of the predictable variation between the three year groups, while the second function accounted for the remaining predictable variation.

Correlations between the generated discriminant scores and the original seven test scores are shown in Table 10.

It can be noted from this data that the I.Q., reading comprehension and division tests have the highest loadings on the first discriminant function and largely characterise the dimension measured by this function. The ability to successfully complete the I.Q. and reading comprehension tests, as distinct from the division test tend to determine a pupil's score on the first function.

QUESTION	Sample 1		Sample 2		Sample 3		Sample 4		ALL	
	Q.28	Q.35	Q.28	Q.35	Q.28	Q.35	Q.28	Q.35	Q.28	Q.35
25B										.0260
25C									.0126	
25D	.0203		.0577*		.0089					
25F						.0409				.0395
26A	.0143		.0049	.0548*						.0082
26D						.0489				
26 other	.0340								.0166	
27A									.0143	
27B	.0527*				.0481				.0053	
27D	.0433									
28	0.0	.0000	0.0	.0000	0.0	.0000	0.0	.0000	0.0	.0000
29A										.0029
30										0112
31			.0449			.0119		.0257	.0002	.0007
32	.0000	.0004	.0102	.0256			.0000	.0003	.0000	.0000
33	.0001	.0029					.0121	.0001	.0001	.0000
34A	.0181	.0046							.0315	
34E	.0109									
35	.0000	0.0	.0000	0.0	.0000	0.0	.0000	0.0	0.0	0.0
37A									.0268	
37B	.0153								.0223	
37C			.0398							
38A									.0503*	
38B					.0509*					
38E					.0008		.0499		.0001	
38G						.0499				
39		.0055		.0048	.0072				.0503*	.0007
40		.0294	.0327	.0149			.0205		.0004	.0001
41				.0397					.0030	.0022
41A				.0238					.0079	.0508*
42A	.0240								.0405	
42C				.0456						
42E	.0281									.0214
42				.0310						

Grade 5 and Grade 7 Comparisons

As identical reading comprehension, word knowledge and arithmetic tests were administered to both the Grade 5 and Grade 7, 1965 and 1970 samples, a further basis of comparison was available. The results are shown in Table

TABLE 12: COMPARISONS BETWEEN GRADE 5 AND GRADE 7 MEAN SCORES FOR 1965 AND 1970 YEAR GROUPS

		1965	1970
Word Knowledge:	Grade 5	25.97	25.86
	Grade 7	42.96	42.04
Reading Comprehension:	Grade 5	24.43	24.05
	Grade 7	35.49	37.80
Addition:	Grade 5	37.46	36.67
	Grade 7	44.80	44.17
Subtraction:	Grade 5	36.31	37.28
	Grade 7	49.98	48.03
Multiplication:	Grade 5	27.44	24.11
	Grade 7	33.22	31.89
Division:	Grade 5	24.26	21.42
	Grade 7	33.39	31.28

The statistics in Table 12, apart from allowing some direct comparison of Grade 7 and Grade 5 standards (as measured by the particular test administered), permit more accurate estimate of performance trends and interactions.

For example both the reading comprehension and word knowledge tests indicate substantial differences between Grade 5 and Grade 7 samples. This difference apart from confirming the fact that students acquire considerable skill and knowledge between the Grade 5 and Grade 7 level, may also indicate that for Grade 5 students the tests are too difficult. The mean Grade 5 word knowledge score was only one quarter of the total possible score.

A further use of the Table above is to determine whether the trends for 1965 and 1970 are consistent for Grade 5 and Grade 7. In technical terms this question may be framed by asking whether there is an interaction between grade and year of survey. Probably the most significant interaction trend concerns the reading comprehension results. The relative improvement in Grade 7 reading is not apparent at the Grade 5 level. There is no corresponding interaction of this type in the closely related word knowledge.

Explaining this result is a speculative matter. Of course there is the possibility that the relative gain is due to sampling error. Or, the effect may well be due to some factor (such as experience of Grade 7 teachers or a curriculum innovation) which has not been considered in the survey.

The 1960 Peak

The relatively outstanding performance of the 1960 sample deserves some discussion. Was that year the highwater mark of Grade 7 achievement in the basic skills tested? What alternative explanations exist? A first point of verification might be an examination of sampling procedures. Anomalies in the selection of pupils may have introduced bias.

The 1960 report does not elaborate the procedures adopted in drawing the sample. It simply states that "During the last week in October 1960, 1,000 children in Grade 5 and 1,000 children in Grade 7 classes throughout the State were given a battery of tests". (p.1) However official records indicate that based on location and class of school, a proportionate random sample was selected. In other words, sampling procedures were comparable to those adopted in the other surveys.

A second possible source of error could have been the marking and scaling procedures adopted for the 1960 survey. However, the arrangements adopted for the 1960 survey were comparable to those adopted for the other surveys. Lists with full instructions for administering and marking tests were sent to schools. The class teachers then administered the tests, marked them from keys provided, entered results on the scoring sheets provided and returned to Head Office all tests, both used and unused, instructions and marking keys. In the 1960 survey, for the first time automatic data processing procedures were utilised and basic analyses, following full specification, were contracted to I.B.M. Thus while complete standardisation of test administration procedures could not be totally ensured,

there appears no reason to suggest why any anomaly might have occurred in 1960 rather than in any other survey.

The relatively high average test scores of the 1960 subgroup must stand as reasonable estimates of that particular sample's performance. For several of the tests, notwithstanding that statistical tests are not possible, the differences between median scores for that year and the other survey years seem of sufficient magnitude to rule out the caprice of sampling error as an explanation of events.

The Intelligence Test Results

The mean intelligence test scores showed a consistent upward trend over all survey occasions at both the Grade 5 and Grade 7 level. On none of the skill tests was this pattern repeated. The simplistic conclusion that follows is that children are becoming progressively "brighter", though not necessarily more able to read and compute.

The 1965 report noted this trend and suggested that factors to be considered were the exclusion of "special schools" and the lapse of time since the norming of the Australian Council for Educational Research's Intermediate D Intelligence Test in 1949. While a renorming would have adjusted subsequent survey averages closer to the theoretical "average 100" this event would not help explain why in this particular intelligence test progressively over each five year period children have successfully completed more test items.

For some reason children appear to becoming more adept at responding to the items that compose the Australian Council for Educational Research Intelligence Test. Whether this facility is attributable to more than test wiseness (practice and exposure to comparable types of tests or test items) or, whether the schools have been progressively incorporating into their curricula components that might form the basis of an intelligence test, is open to question. An inquiry following the 1970 test administration indicated that many children had completed a form of the Australian Council for Educational Research Intelligence Test early in the year under the direction of Departmental Guidance Officers. However, both hypotheses seem plausible.

A perplexing aspect of this trend, assuming that it represents a real gain in ability to respond to intelligence tests, is that it has not been accompanied by similar patterns of performance on the skill tests. It has already been noted that most of the tests are at least moderately inter-correlated. For the Grade 7 sample the correlation coefficients ranged from 0.40 for addition to 0.72 for reading comprehension. This circumstance makes explanation more difficult. This phenomenon seems worthy of further investigation.

The Relationship Between School and Other Factors to School Achievement, Need for Caution

It has already been discussed in this Report that the survey is not an appropriate means of determining the influence (or causal relationship) between school organisational factors and school achievement. This view can be easily demonstrated in Table 13: Mean Grade 7 Achievement Test Differences According to Certain School and Other Factors. Results from the survey in 1965 and 1970 have consistently favoured class sizes of forty or more pupils. The 1960 survey found that the highest levels of achievement occurred in classes of *fifty* or more children! Does this mean that the Education Department should rush towards *increasing* class size? Obviously not. There is no substantial evidence that class size, of itself, contributes to higher or lower school achievement. It could well be that more skilled teachers are found in larger classes, a deliberate strategy effected by the school principal. This hypothesis, like many others that could be advanced is largely speculative. The survey at least cannot substantiate or dismiss these explanations. In a similar manner there is little to be gained in attributing causal influences to the relationships that occur, say between location of school and achievement. This is not to say that the results in Table 13 are necessarily of no use. As *description* of achievement according to the various categories they are a valid record. Yet even as description the usefulness must be qualified. For example what is served by knowing that pupils in metropolitan schools did "better" than children in country schools at multiplication though worse at division. It seems absurd to think that there is some underlying quality of country schooling which inhibits multiplication skills yet facilitates division skills. Presumably, differences of this type are largely due to sampling error.

TABLE 13: MEAN GRADE 7 ACHIEVEMENT TEST DIFFERENCES ACCORDING TO CERTAIN SCHOOL AND OTHER FACTORS[1]

Test	Sex of Pupil (+ favours boys)			Location of School (+ favours Metro.)			Class Size[2] (+ favours larger)		Class Grouping[3] (+ favours grouped)		Streaming (+ favours streaming)		Class of School (+ favours Class 1)		
	55	65	70	55	65	70	65	70	65	70	65	70	55	65	70
Intelligence Test	+0.26	-0.39	+0.51	+3.22	+3.21	+1.37	+2.79	+5.71	-1.42	-1.44	-0.12	-1.31	-1.95	-1.07	-2.44
Word Knowledge	+1.67	-1.45	-1.40	+3.15	+3.19	-0.51	+2.95	+6.80	-2.35	-1.75	+0.75	-1.04	-4.19	-1.71	-1.26
Reading for Meaning	-0.46	-1.75	-2.25	+2.97	+0.61	-0.85	+1.19	+7.34	-0.44	-2.59	-1.18	+1.90	-3.43	-1.91	+0.65
Addition	-1.38	-1.13	-1.25	-0.91	+2.78	+1.15	+0.44	+1.59	-0.56	-2.59	+1.69	+0.50	+0.50	+1.58	-0.88
Subtraction	-1.17	-0.34	+0.05	+0.51	+3.17	+1.38	+1.32	+0.73	-1.81	+0.12	+2.63	+0.88	-1.70	+1.51	-1.64
Multiplication	-0.27	-0.33	-0.30	+0.99	+1.94	+0.54	+0.90	+1.86	-1.04	-0.61	+1.68	+0.05	-1.12	+1.71	-1.41
Division	-1.12	-0.84	-1.13	+2.30	+2.97	-0.06	+2.18	+2.74	-1.44	-1.75	+2.40	-0.44	-3.38	+0.85	-1.81
Spelling (Words)	N.A.	-2.39	-3.43		+3.40	+2.13	+1.96	+3.71	-2.34	-1.67	+2.92	-1.53	N.A.	-1.23	-2.33
Spelling (Sentences)	N.A.	-2.47			+3.90	+2.88	+2.04	+5.01	-1.80	-1.93	+2.78	-2.12	N.A.	+0.35	-2.10

1 Differences are expressed in terms of raw score units.

2 The mean differences reported in this column are drawn from comparisons between class size categories "31-40" and "40 or more pupils", where sub-sample sizes were in 1965, 274 and 722 pupils respectively and in 1970, 526 and 439 pupils respectively. These two categories contained nearly 90 per cent of the total sample of pupils.

3 The mean differences reported in this column are drawn from comparisons between pupils instructed in either single grade classrooms or classrooms which contain pupils in two grades. Pupils in classrooms containing more than two grades contributed to less than five per cent of the total sample. In the 1965 sample 871 pupils were in single grade classrooms and 18 in rooms containing two grades. In the 1970 sample 716 pupils were in single grade classrooms and 201 pupils in rooms containing two grades.

Sex Differences

The superior performance of girls in certain tests of educational achievement is well noted in the literature. A relatively faster rate of cognitive and emotional development is said to be one factor accounting for this phenomenon. Table 13 shows on most tests marginal advantages in favour of girls. However, it should be noted that many of the differences in mean performance between the sexes are very slight and could be due to sampling error. The occasional superior performance of boys, for example in word knowledge in 1955 and subtraction in 1970, suggests the need for some qualification of clear cut statements of expectation of superior performance on the part of girls.

Location of School

In 1965 the pattern of survey results showed a consistent advantage favouring the metropolitan schools. In 1970 the situation was less clear with most differences, excepting the spelling test results, of a very small magnitude. The position is now such that, in terms of the test battery employed in the survey, it is not possible to make unqualified statements regarding superior metropolitan or country performance.

Class Size

In order to examine the relationship between class size and achievement five categories were arbitrarily decided: 0-10, 11-20, 21-30, 31-40 and more than 40. The large majority of the sample for 1965 and 1970 (comparable data from 1955 and 1960 were not available) were accommodated in categories of "31-40" and "more than 40". Consequently only these two categories were utilised in subsequent analyses. As Table 13 indicates, without exception differences between mean performances of children in these categories favoured children in the larger class size. In the 1970 sample these differences are of considerable magnitude, particularly in the tests containing a "verbal" component.

The 1960 report discussed a similar trend. It noted that "The best performance in both grades (Grade 5 and Grade 7) were obtained by children in classes of 50 or over. On the composite scores in both grades, this group had less retardation and more accelerated children than any other group". (p.13)

Class Grouping

A grouped class in this study refers to a multi-grade class; a class where a single teacher is responsible for the supervision of two groups (or more) of students each largely and cohesively pursuing separate objectives and curricula. The situation occurs in those situations where because of insufficient numbers to justify the formation of separate classes a single teacher is given instructional responsibility for more than one grade.

It should be noted that class grouping, along with other variables employed in this survey, is a rather coarsely grained variable. It does not necessarily provide any picture of what instructional strategies are adopted in the classroom, and a great many different procedures may operate under a guise of 'mixed grades' or whatever nomenclature is used.

Relatively few students are enrolled in Government schools in this State which operate with a mixture of more than two grades in one classroom. Hence, the statistics derived for classes of three and more grades, because of the paucity of numbers, tend to be unreliable. In both the 1965 and 1970 surveys the class containing four grades tended to do better than the more grade-homogeneous groupings. When it is borne in mind that the sub-sample size for the 1965 and 1970 was 41 and 11 respectively then the need for caution becomes apparent. Consequently Table 13 contains statistics which relate to classrooms with single grade or collectivities of two grades. Results favour by small margins ungrouped classes with the single exception of the subtraction test.

Streaming

The division of children into classes according to general ability (streaming) has been a contentious issue for many years. Various educational advantages are attributed to instruction in either streamed or unstreamed class grouping. The literature tends to be equivocal. Unfortunately, Table 13 does not yield any more conclusive a picture. In both the 1965 and 1970 surveys there were superior performances for both the streamed and unstreamed situations. To add to the inconclusiveness on some tests in 1970 the 1965 pattern of performance was reversed.

It does not seem possible to make generalised statements favouring streamed or unstreamed conditions. Furthermore to conclude that streaming favours the development of subtraction computation skills yet not multiplication skills seems a fatuous statement.

Class of School

For administrative purposes schools are divided by the Education Department into various categories. Class IA schools are the largest with enrolments of approximately 700 children. Class IV schools are the smallest and are usually remote, one teacher schools with enrolments of perhaps 20 children. Thus in some respects "class of school" is a proxy variable for "school size".

In Table 13 comparisons are shown in terms of differences between performances of pupils in Class IA and Class II schools. Thus the comparisons are between children attending the largest and the middle range of primary schools. To have utilised Class IV instead of Class II schools in the comparison would have in essence repeated the metropolitan-country comparisons.

The results are not clear cut though a clear majority of comparisons favour the children attending the smaller Class II schools.

CONCLUSIONS

The 1955 Survey

The 1955 survey concludes:

1. The main purpose of the survey was to enquire into the amount of retardation. This was seen to be very slight in reading, whereas there appears to be a definite retardation in arithmetic.

The conclusion continues:

> It seems possible that there might be some connection between the methods of instruction used and the amount of retardation. For some time reading has been approached from the point of individual differences. Children are heard read individually and generally are divided into three or more reading groups in primary schools, to the extent that this is standard practice. This is not so to the same extent for arithmetic. If individual differences can be cohered for arithmetic by some form of group instruction as is done by reading it should be possible to accomplish this within the present organisation with classes existing at present.

2. Because of the nature of the tests involving number combinations and tables, the fundamental processes, it would appear that these need constant repetition and revision up to Standard VI in arithmetic.

The report concludes on an optimistic note:

3. Care must be taken to see that the satisfactory standard of reading is maintained and that the small percentage of retarded readers is eliminated.

In terms of conclusion three, it could be argued that by 1970 the schools were meeting with some success. The number of children reading below their grade average had been reduced (though not eliminated) and the overall, standard appeared to have risen considerably.

The situation in arithmetic was more confused. Gains had been achieved in addition and subtraction while losses had occurred in multiplication and division.

The 1960 Survey

Performance of children in the 1960 survey was summarised as follows:

> The results seem to indicate that a large reduction of retardation in reading has occurred over the five years between 1955 and 1960, and an increase in those children who were considered accelerated has also become obvious. Arithmetic shows some improvement but not to the same marked degree as in reading (p.11).

The improvement in reading was explained in these terms:

> It seems possible that curriculum requirements and methods of instruction used might bear some relation to the amount of retardation. For some time teachers and research workers have paid a lot of attention to catering for individual differences in reading. Over the last five years individualized reading schemes, the recognition of the necessity to give children readers designed to cater for their individual abilities, reading readiness programmes and a greater effort on giving children instruction in specified reading skills have all helped to produce these results (p.12).

As in 1955 arithmetic results were categorised as "poor" even though some overall improvement had been noted.

> Although improvement in arithmetic has taken place, this has not been due to any organized effort to produce these results.
>
> In arithmetic, more material is needed to give children the opportunity to gain a knowledge of number by being able to understand it, rather than to develop it through rote drills and abstract experience. It has been said that the fundamental processes are of utmost importance in being able to manipulate numbers. If this is so, the poor results in arithmetic as measured by the tests used in the survey, will only be obviated by an effort to produce an approach to number based on understanding and a recognition that individuals should be able to progress at their own rate to the limit of their capacity. The Cuisenaire method of teaching number may be a solution to some of these problems (p.12).

The 1965 Survey

The report of the 1965 survey is confined largely to a description of results and contains little, if any judgmental observation regarding standards of reading or arithmetic.

The emphasis of the 1965 survey was primarily to determine the influence of selected factors such as location and size of school, school organisation, class size, bus travel and sex of pupil upon pupil achievement.

The report offered no recommendations for further action.

The 1970 Survey

1. Large scale longitudinal studies, such as the Survey of Primary School Achievement inherit particular problems of sampling and test reliability and validity. These are crucial aspects of any empirical investigation of this type for unless the sample is demonstrably representative of the population and the tests are of proven adequacy then any conclusions derived from the survey must be of doubtful value.

Of these two major considerations, sampling and instrumentation, the former is the more satisfactory in its present survey format. This is not to say that there could not afford to be modifications and refinements. For example, the precision of the sampling would be increased if, assuming that the present ceiling of approximately 1,000 pupils must remain, a larger number of schools were selected and some proportion randomly chosen from within each class or grade cohort.

Of more significance, is the nature of the instrumentation, that is, the test battery used to monitor standards.

The particular achievement tests appear to be pitched at an inappropriate difficulty level. They do not adequately discriminate. They test only a very narrow perspective of primary school achievement. It would appear that more appropriate tests could be adapted or constructed to either replace or supplement the existing test battery in order to give the survey the depth and meaning that are warranted by the last decade of curriculum innovation. Without this modification, a future survey does not seem warranted.

It cannot be emphasised too strongly that without a proper understanding of the nature of the tests used in the survey, statements about decline or improvement in "standards" are likely to be highly misleading. Many teachers in 1970 would dismiss the attributes being measured by several of the tests, particularly those relating to arithmetic computation, as boardering on the trivial in comparison to the total curriculum of the school.

2. At the Grade 7 level the overall trends in primary school achievement over the past fifteen years appears to have been that performance in most of the skills listed reached a peak in 1960 and deteriorated to some extent after that year. 1965 and 1970 comparisons revealed the 1965 year group to

be at an advantage (though in some subjects this advantage was nearly negligible) in all subjects except reading comprehension.

It is worth noting in an attempt to provide balance that the 1955 report concluded that the standard of reading was satisfactory and should be maintained. In fact in 1970 performance on the reading comprehension test had risen by a statistically significant amount. There is obviously no absolute standard of performance.

At the Grade 5 level, the discrepancies between the 1965 and 1970 year groups favoured the 1965 students.

In 1970 there was a greater dispersion of test scores than in any other survey year.

Interpreting these results is largely speculative owing to the inadequacies of the survey as a research method. It is unlikely that any single factor is responsible for the differences between the year groups. One tentative explanation put forward is that the particular skills measured by the survey test battery have received less emphasis in 1970 owing to substantial curriculum change. Teachers in 1970 may not have stressed these skills to the same extent as their 1960 counterparts.

3. In general, it is true of the 1970 year group that according to the test performances:

i. Girls out performed boys on a majority of tests.

ii. There did not exist a clear and consistent pattern of results favouring either metropolitan or country pupils.

iii. Pupils in the larger classes gained on average higher scores than pupils in smaller classes.

iv. Pupils in single graded classes out performed pupils in classes with mixed grades.

v. Pupils in classes streamed according to general ability did not consistently gain on average higher test scores than pupils in unstreamed classes.

vi. Pupils in Class II primary schools tended to gain higher average scores on most tests than children in Class IA primary schools.

4. Consideration must be given to the prospect of a 1975 survey. In view of the limitations regarding the current test battery an assessment must be made whether the likely outcomes of the survey warrant the investment of resources. To replace components of the test battery destroys the longitudinal component of the project. Hence a question must be posed regarding the value of continuing to administer the existing tests or whether a fresh start to monitoring standards is required.

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APPENDIX 1: CLASSIFICATION BY SCHOOL OF 1960, 1965 AND 1970 GRADE 7 SAMPLES

Classification	Total Population %			Sample %		
	1960	1965	1970	1960	1965	1970
Junior High School	12.0	10.1	-	12.0	-	-
Class 1A	-	22.3	25.9	-	25.33	38.84
Class I	64.0	44.2	64.0	64.0	49.26	40.02
Class II	8.0	11.8	8.0	8.0	12.36	8.67
Class III	10.0	9.7	10.0	10.0	11.84	10.03
Class IV	4.0	1.2	4.0	4.0	0.01	0.02
Mission		.04	.08	2.0	-	-
Correspondence	2.0	.02	.02	-	-	-
Total	100.0	100.0	100.0	100.0	100.0	100.0

APPENDIX 2: TESTS ADMINISTERED TO GRADE 7 SAMPLE IN 1955, 1960, 1965 AND 1970 SURVEYS

Test	Time Limit	No. of Items	Reliability†	1955	1960	1965	1970
Intelligence							
A.C.E.R. Intermediate D	30	80		✓	✓	✓	✓
Reading							
A.C.E.R. Reading for Meaning Form D	20	60		✓	✓	✓	✓
A.C.E.R Reading for Meaning Form D	20	60				✓	
A.C.E.R. Word Knowledge Form C	10*	100		✓	✓	✓	✓
A.C.E.R. Word Knowledge Form D	10	100				✓	
A.C.E.R. Silent Reading Form C		60		✓			
A.C.E.R. Silent Reading Form D		60				✓	
Spelling							
W.A. Grade 7 Spelling Test		49	?		✓	✓	✓
A.C.E.R. Spelling Test Form C		102	0.94		✓	✓	✓
Arithmetic							
A.C.E.R. Arithmetic Form C							
Part 1 Addition	70	50	0.85	✓	✓	✓	✓
Part 2 Subtraction	75	55	0.79	✓	✓	✓	✓
Part 3 Multiplication	55	35	0.73	✓	✓	✓	✓
Part 4 Division	60	40	0.93	✓	✓	✓	✓
Departmental Arithmetic							
Part 1			?		✓		
Part 2			?		✓		
Terms and Relations		60	0.75	✓			

* This test was administered with 10 minute and 15 minute time limits in 1965 and 1970. The standard time (reported in manuals) was 10 minutes.

† Data from test manuals.

APPENDIX 3: SAMPLE PRACTICE ITEMS

1. A.C.E.R. Intermediate Test D

1. FOOT is to MAN as HOOF is to (?)
   (1) dog (2) horse) (3) lion (4) cat (5) bird .. .. ( )

2. What is the next number in this series?
   5, 10, 15, 20, 25, ... ( )

2. A.C.E.R. Word Knowledge

1. quick	1. soft	2. quiet	3. fast	4. run	4. sharp (3)
2. small	1. man	2. baby	3. big	4. little	5. ant ( )

3. A.C.E.R. Reading for Meaning

The trees were losing their leaves of crimson, gold and brown. As they fell, Old Tom the gardener swept them on to burning heaps from which the blue smoke drifted lazily.

The best name for this story is

1. Spring
2. Painting
3. Autumn Leaves
4. Rubbish
5. New Brooms

4. A.C.E.R. Arithmetic Test

Addition: 7
310
88
57

Subtraction: 718
639

Multiplication: 386
78

Division: $9\overline{)600}$

5. A.C.E.R. Spelling (Sentences)

(Children write complete sentences as dictated by a Supervisor)
The completion of the task was greeted with shouts of approval.

6. Western Australian Education Department Spelling (Words)

SWOLLEN The boy's broken arm became swollen SWOLLEN.

APPENDIX 4: ESTIMATING THE INFLUENCE OF SPEEDEDNESS ON THE PERFORMANCE OF THE WORD KNOWLEDGE TEST

Rarely are pure speed or pure power tests ever used in practice. Most tests are partially speeded to some degree, depending on how much time is allocated to the test. Cronbach and Warrington (1951) have provided a means of estimating the effect of the speededness of a test, which may limit the amount of time pupils may spend on a test.

Results from the 1965 survey has been used for this purpose for in that year data were collected from pupils under speeded and non-speeded (or power) conditions.

Parallel forms of the word knowledge test (forms C and D) were administered to the sample. Each form was administered under speeded conditions (10 minutes) and relative power conditions (here 15 minutes was allowed, though more time may have been desirable).

The formula is:

$$T = 1 - \frac{r\,(Sc,Pd).\ r\,(Sd.Pc)}{r\,(Sc,Gd).\ r\,(Pc,Pd)}$$

where S = Speeded Conditions
P = Power Conditions
C & D = Test forms
r = Product Moment Correlation
T = True Score Variance Attributed to Speededness

The outcome of this investigation is that speededness appeared to play a relatively small part in determining the ordering of students on the word knowledge test, at least for 1965, though the estimates of T are on the conservative side. At the Grade 7 level only 4.32 per cent of the variation of the students' word knowledge test performance is attributable to the speededness factor while at the Grade 5 level only 0.1 per cent.

The example above does not provide any information regarding whether this effect operated differentially during the four surveys. It is interesting to note results in the Table below for the word knowledge test, which was administered under both speeded and unspeeded conditions.

SIGNIFICANCE OF DIFFERENCE BETWEEN 1965 AND 1970 MEANS OF WORD KNOWLEDGE TEST ADMINISTERED UNDER SPEEDED AND UNSPEEDED CONDITIONS

	Conditions	1965 $\bar{X}$	1970 $\bar{X}$	Difference P = .05 $\bar{X}$
Grade 7	Speeded (10 min.)	42.96	42.04	Non-Significant
	Unspeeded (15 min.)	54.74	52.36	Significant
Grade 5	Speeded (10 min.)	26.50	25.96	Non-Significant
	Unspeeded (15 min.)	32.16	32.30	Significant

While the differences in time limit did not appear to affect the relative standing of the two year groups at the Grade 5 level, it did at the Grade 7 level where, with the additional time, the 1965 year group significantly outscored the 1970 group. This result does to some extent substantiate the hypothesis advanced earlier that the ability to compute under speeded conditions was a much more important aim prior to 1970 and may therefore partly explain relatively poor performance of the 1970 year group on various tests.