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Fire Research Note

No. 636

FIRE EDUCATION: THE APPARENT EFFECTIVENESS
OF A WALL CHART

by

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F.R. Note No. 636
September, 1966.

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SUMMARY

Children who had seen an educational poster about fire were questioned about its contents, and their answers compared with those of a group who had not seen it.

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MINISTRY OF TECHNOLOGY AND FIRE OFFICES' COMMITTEE
JOINT FIRE RESEARCH ORGANIZATION

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INTRODUCTION

Many posters concerned with the prevention and extinction of fires receive widespread display, in the hope that people who have seen them will, when the occasion arises, recall this information and act in a rational way.

A small-scale experiment was conducted to see whether a particular wall chart seemed to have any effect. After a copy had been displayed in a school classroom, a written questionnaire was given to a group of pupils who used that room. It was also given to a similar group who did not normally use the room. The answers given were compared.

Any differences between the sets of answers given by the two groups would give an idea of the difference between the actions that might be taken in practice, and thus indicate the effectiveness of the wall chart.

THE WALL CHART

This is produced by Illustrated Classroom Education Ltd., for the Fire Protection Association. It is colourful and large (157 cm x 118 cm) (40 in x 30 in).

The main title is "Fire and its Prevention". Included are sections on the "Fire Triangle", fuels, and "How some domestic fires may be put out". A criticism that has been made is that rather too much material is included. It should be pointed out, however, that the wall chart is primarily designed as a teaching aid, and a 16-page booklet ("What is Fire?") is available for use with it. This was not made use of at all in the experiment described.

Over 10,000 copies of the chart are understood to have been distributed, mainly to secondary schools in the United Kingdom, on the basis of one per school. What use is made of them is not known. There is no obligation on education authorities to provide any fire education, and it is thought that many do not do so.

DISPLAY OF WALL CHART

The chart was put up without comment on the wall of a room, used for about 2½ hours a week by the children concerned, in a position where similar posters on different subjects are displayed from time to time. After two weeks it was removed. The questionnaire was handed out one week after removal of the wall chart.

THE CHILDREN

The questionnaire was given to two parallel joint A- and B-stream groups in a mixed secondary modern school. Average age was about 12.4 yr, and IQ ranged from 100 to 130.

There were about 20 boys and 20 girls in each group, the exact numbers being shown in Table 1. The total number questioned was 77.

Most of the children were of British origin. The locality is urban, industrial and prosperous.

THE QUESTIONNAIRE

Considerable thought was given to wording, to avoid the air of an examination paper, although it is difficult to know how successful this was. Various points made by the wall chart were selected, especially those which were fairly definite or believed to be of the greatest practical importance. The questionnaire (Appendix I) was tried beforehand on a few adults to check that the questions were not ambiguous, the only obvious conclusion being that the idea of the "Fire Triangle" was little known, despite its adoption as a theme for fire prevention publicity.

The opportunity was also taken to include a question about the personal experience of fire of the children. The conclusions are discussed in a separate report (1).

MARKING SYSTEM

The answers given to all questions varied very widely, and considerable judgement was often called for in deciding whether an answer was acceptable. Since the object was a comparison between two groups, quantitative accuracy is not of primary importance. No attempt was made to estimate degrees of acceptability by awarding fractional marks.

Some of the more interesting points about the answers are discussed in Appendix II. A summary of the results is shown in Table 1.

Table 1. SUMMARY OF RESULTS

Numbers of Correct Answers

<u>Question and Answer</u>	<u>Children in Room without Poster</u>		<u>Children in Room with Poster</u>	
	<u>Girls</u>	<u>Boys</u>	<u>Girls</u>	<u>Boys</u>
A. 1. Close doors	5	2	5	8
2. Get everyone out	12	4	7	10
3. Dial 999	18	14	17	16
4. All three (inc. above)	3	0	4	3
B. Take plug out	6	6	12	7
C. Wrap in rug etc.	16	8	12	16
(D. See separate report)				
E. Put lid on	3	0	1	2
F. Explodes	0	0	1	1
G. Smother, use extinguisher etc.	8	9	4	4
H. 1. Heat	6	7	1	1
2. Oxygen	8	11	5	10
3. Fuel	4	1	1	5
4. All three (inc. above)	1	1	0	1
Total questioned	19	20	21	17

DISCUSSION OF RESULTS

If the answers given by the two groups are analysed question by question, no statistically significant difference shows up in the proportion of correct answers to any single question.

If the total numbers of correct answers to all questions added together are compared, again the difference between the two groups is not statistically significant.

Although it is thus difficult to measure the effectiveness of the poster, several points of interest emerge from looking at the figures (see Figs. 1-4).

The girls who had not seen the poster gave a higher proportion of correct answers to nearly all the questions than did those that had seen it. No reason is known for this unexpected result.

The anomalous responses of the girls cast some doubt on the validity of similar comparisons for the boys, and they must be treated with more reserve than if they had been looked at by themselves. For the more practical questions, it looks as if the wall chart had some slight educational value (but there would be no point in attempting to measure it).

It would seem that if the subject matter of the poster is to be got across more effectively, some use must be made of the teaching notes available.

CONCLUSION

An educational wall chart on the subject of fire, passively displayed in conditions which might be regarded as typical, did not have large measurable effects on the knowledge of the persons to whom it was directed. However, the chart was designed primarily as a teaching aid and it is possible that a poster intended for passive display might have been more effective.

ACKNOWLEDGEMENT

The work described in this paper forms part of the programme of the Joint Fire Research Organization of the Ministry of Technology and the Fire Offices' Committee; the paper is published by permission of the Director of Fire Research.

Thanks are due to the Headmaster, staff and pupils of Denbigh Road Secondary School, Luton, for their co-operation in this exercise.

REFERENCE

- 1) CHAMBERS, E. D. Fire: the personal experience of a sample of children. Ministry of Technology and Fire Offices' Committee Joint Fire Research Organization. Fire Research Note No. 630. Boreham Wood, Herts., 1966.

APPENDIX I

THE QUESTIONNAIRE

Read this before you start

This is not an examination, but our method of carrying out a survey to see how much people know about the subject of fire.

Do not spend more than about five minutes on any question. Do not worry if you cannot think of anything to write.

Your answers will be analysed at the Fire Research Station, Boreham Wood. The results will help us to get better posters designed, which may one day save somebody's life.

Write as much or as little as you like. If you have any questions, please ask.

Please fill in your name here:-

Name

Age last birthday

Now start

- (A) What do you think you would do if you were in your house, and you came across a really big fire in one of the rooms? (Try to think of all the things you might do).
- (B) What can you do to make absolutely sure that a fire will not start in electrical apparatus when it is not in use?
- (C) What do you think you would do if you were with somebody, and their clothes caught fire?

- (D) Answer this question only if you have ever had a fire in your house (apart from in the grate of course).

If you remember one, what actually caught fire?

Did anybody call the fire brigade?

- (E) If somebody was cooking something in a frying pan, and the fat caught fire, what do you think they ought to do?

- (F) If a solid material that will burn is in a very finely divided form - for example, a dust cloud - do you know anything special about the way it might burn?

- (G) If a liquid catches fire, what sort of method is usually best to put the fire out?

- (H) When there is a fire of any sort, there are three things that are always present. Can you name any of them?

Thank you for your co-operation.

APPENDIX II

ANSWERS TO QUESTIONS

Question A

What do you think you would do if you were in your house, and you came across a really big fire in one of the rooms? (Try to think of all the things you might do).

The correct procedure, according to the wall chart, is:-

1. Close doors
2. Get everyone out
3. Dial 999

On the whole the answers were quite sensible, although only 10 children noted all three points. As failure to carry out any of these items at the appropriate time could have serious consequences, it would seem to be worth trying to teach the routine as a standard drill.

The closing of doors (and windows) is not a natural reaction, and it is of some interest that as many as 19 children mentioned it. The idea can only have been absorbed from some form of instruction.

On the other hand 2 children would have opened the window, in one case 'to let the smoke out'.

The desirability of evacuating a house is something that depends very much on the circumstances, and the fact that it is not mentioned in an answer may mean that it is thought rather obvious, when considered dispassionately.

When panic occurs however, a person, perhaps asleep or deaf, may be forgotten, and fatal casualties occur because of this. In a house where part or the whole is let off in lodgings, the person discovering a fire has little idea who else is in; but the aim should still be to warn occupants so far as possible. It is important that this should be remembered.

The number of children mentioning it was 33.

The decision that faces any person discovering a fire is whether there is a strong chance that it can be controlled without calling the fire brigade. A "big fire" was mentioned in the question to suggest that the discoverer should call the fire brigade at once. Whether the point was always noticed is not known.

Whether it was or not, several children would, apparently, have attempted to control the fire before calling the fire brigade, in one case even fetching a hose. There seemed to be a tendency to regard the fire brigade as an organisation to be called if unaided efforts had been unsuccessful, rather than if they were thought likely to be. However, 65 answers were counted as correct.

It would be interesting to know if children wanting to call the fire brigade could use the 999 system efficiently, but not much evidence either way is revealed. (One child, not of British origin, would have asked for the police).

Question B

What can you do to make absolutely sure that a fire will not start in electrical apparatus when it is not in use?

The wall chart shows a plug being pulled out of a wall socket, and an answer that suggested this was regarded as correct. There were 31 such answers.

Other answers were not necessarily wrong, but arose from different interpretations of the question. Wiring should not be damp or frayed, nor overloaded, and it was occasionally suggested that the Electricity Board should be consulted. Little children might well be kept clear of electrical apparatus, and a "bling" plug in a wall socket would certainly do no harm.

Among the more unusual answers were that electrical apparatus should be kept in a cool place, and that no matches should be used.

Question C

What do you think you would do if you were with somebody, and their clothes caught fire?

The chart illustrates a woman wrapping something around a child with burning clothing. Any answer suggesting wrapping a coat, rug etc. around the person, or rolling them on the ground, was regarded as correct. There were 52 such answers, suggesting that this point is already well taught.

A bucket of water was mentioned several times. This might do no harm if it was readily available, but otherwise time would be wasted in filling the bucket. In any case, this was not suggested by the chart and would be likely to be less effective than the method given.

A few answers implied that the object of the coat, etc. was to blow the flames out, and so one must hit or fan the person. Several seemed too eager to try to remove the burning clothing.

One or two quite appropriate first aid measures came up, such as providing 'nice and strong and sweet' tea; as did calling an ambulance.

Question D

This has been analysed separately¹ .

Question E

If somebody was cooking something in a frying pan, and the fat caught fire, what do you think they ought to do?

The poster illustrates a lid being placed on a frying pan. In practice many frying pans do not have lids, although if the idea is grasped perhaps a tray or something similar may be used.

Most of the actions suggested by the answers given could have been quite disastrous. Although one is taught not to apply water to oil fires (apart from using it to cool oil stoves), it did not seem to be appreciated that melted fat is, in fact, oil. There was an alarming readiness to spray cold water on to the pan, also to take it outside, which would sometimes be a most dangerous operation involving the spilling of burning fat.

Children of the age questioned may not have much experience of frying, particularly the boys. Many girls may not receive cooking instruction, but those that do should receive instruction on this point. It is surely a matter for considerable concern that only 6 answers given indicated the procedure recommended by the chart.

Question F

If a solid material that will burn is in a very finely divided form - for example, a dust cloud - do you know anything special about the way it might burn?

The chart states that "Very finely divided (solid fuel), e.g. dust clouds, may explode."

Thus the correct answer is unusually definite. Only two were given.

However, an appreciable minority appreciated that burning would be rapid. Unfortunately, a similar number thought it would be slow.

This general ignorance may not be as important as that in some other fields, since dangerous dust clouds normally occur only in specialised industrial processes, where they are presumably the subject of appropriate educational attention.

Question G

If a liquid catches fire, what sort of method is usually best to put the fire out?

Any answer suggesting smothering, cutting off air, using a foam extinguisher, etc. was counted as correct, there being 25 in all. (Because using sand etc. is not suggested by the wall chart, it was not counted as "correct". If it had been, another 10 answers could have been accepted).

The really inappropriate answers nearly all mentioned water. Two peculiar ideas were using salt, and flapping a blanket over the fire.

Question H

When there is a fire of any sort, there are three things that are always present. Can you name any of them?

The "Fire Triangle" of oxygen, heat and fuel proved much too abstract an idea, and many of the answers were on the wrong lines entirely. Only 3 answers could be counted as correct, although an appreciable number managed to think of one of the three "things".

Some adults who were asked this question beforehand found it unintelligible, but it was difficult to re-phrase the question satisfactorily and keep it relevant. Perhaps the whole idea is best regarded as interesting but theoretical, and teaching attention concentrated on how to prevent and extinguish the most common types of fire.

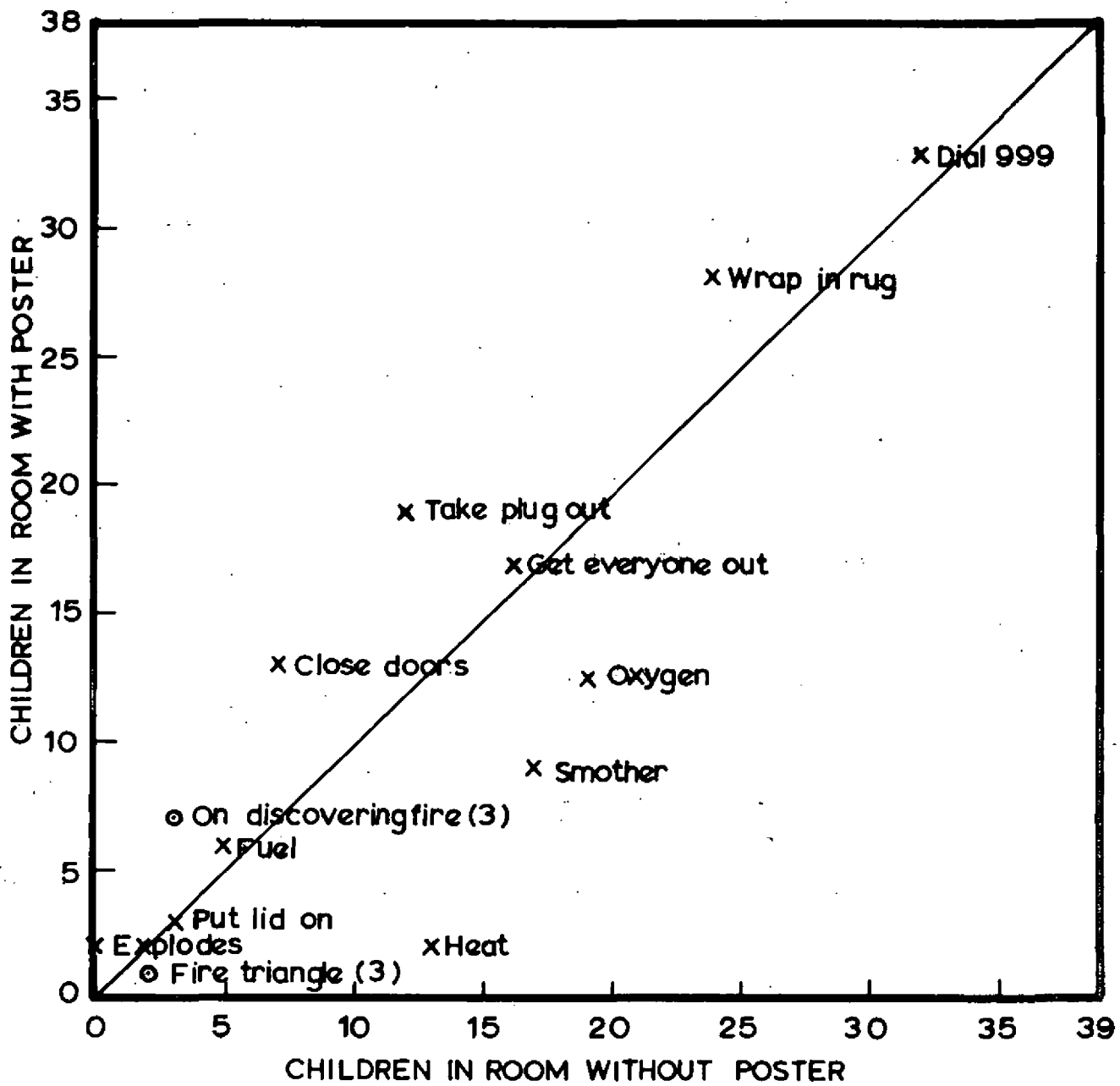


FIG.1. NUMBER OF CORRECT ANSWERS BY 39 CHILDREN IN ROOM WITHOUT POSTER VS NUMBER BY 38 CHILDREN IN ROOM WITH POSTER

FR. 636 1/7039

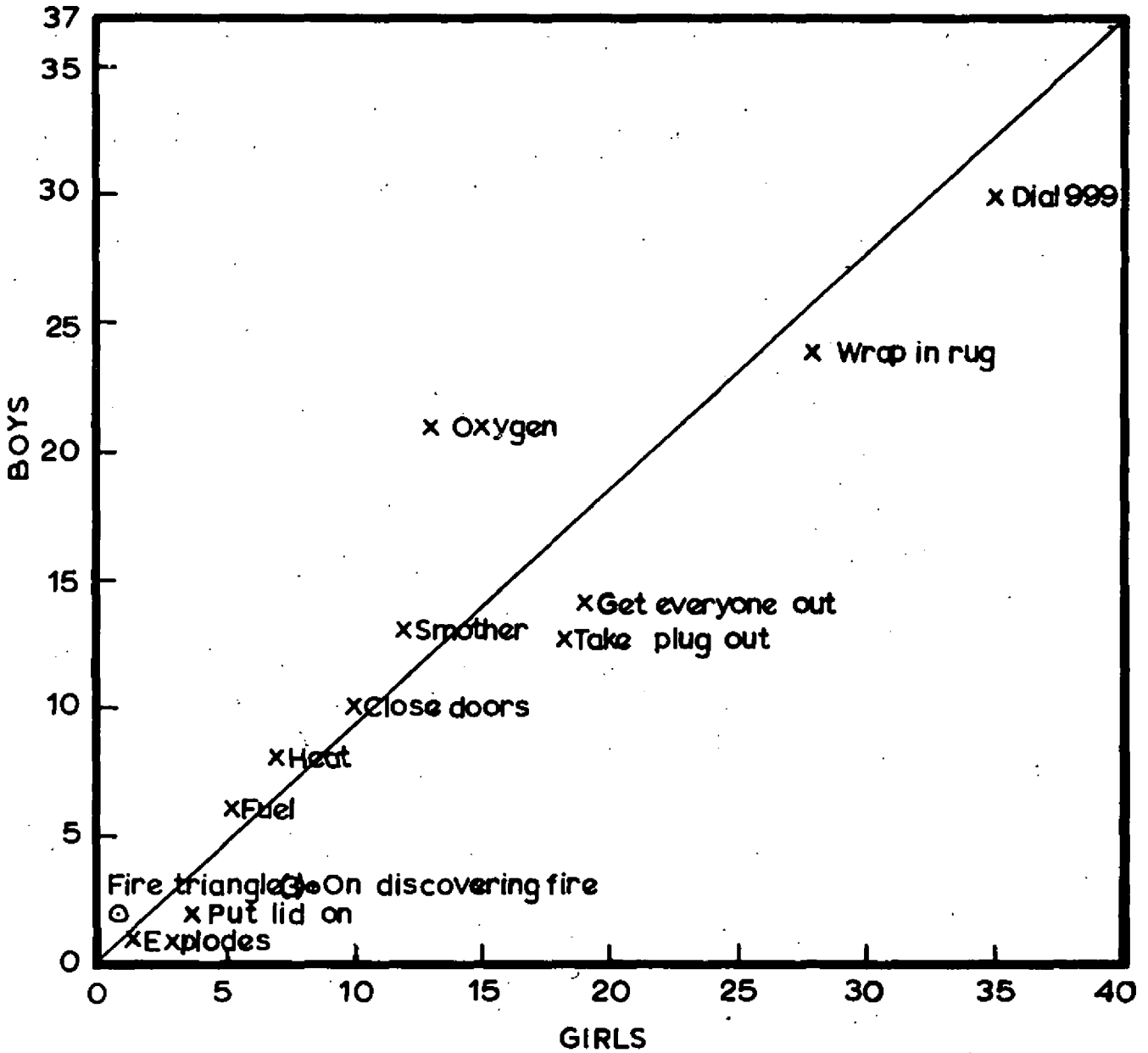


FIG.2. NUMBER OF CORRECT ANSWERS BY 40 GIRLS VS NUMBER BY 37 BOYS

FR 056 17040

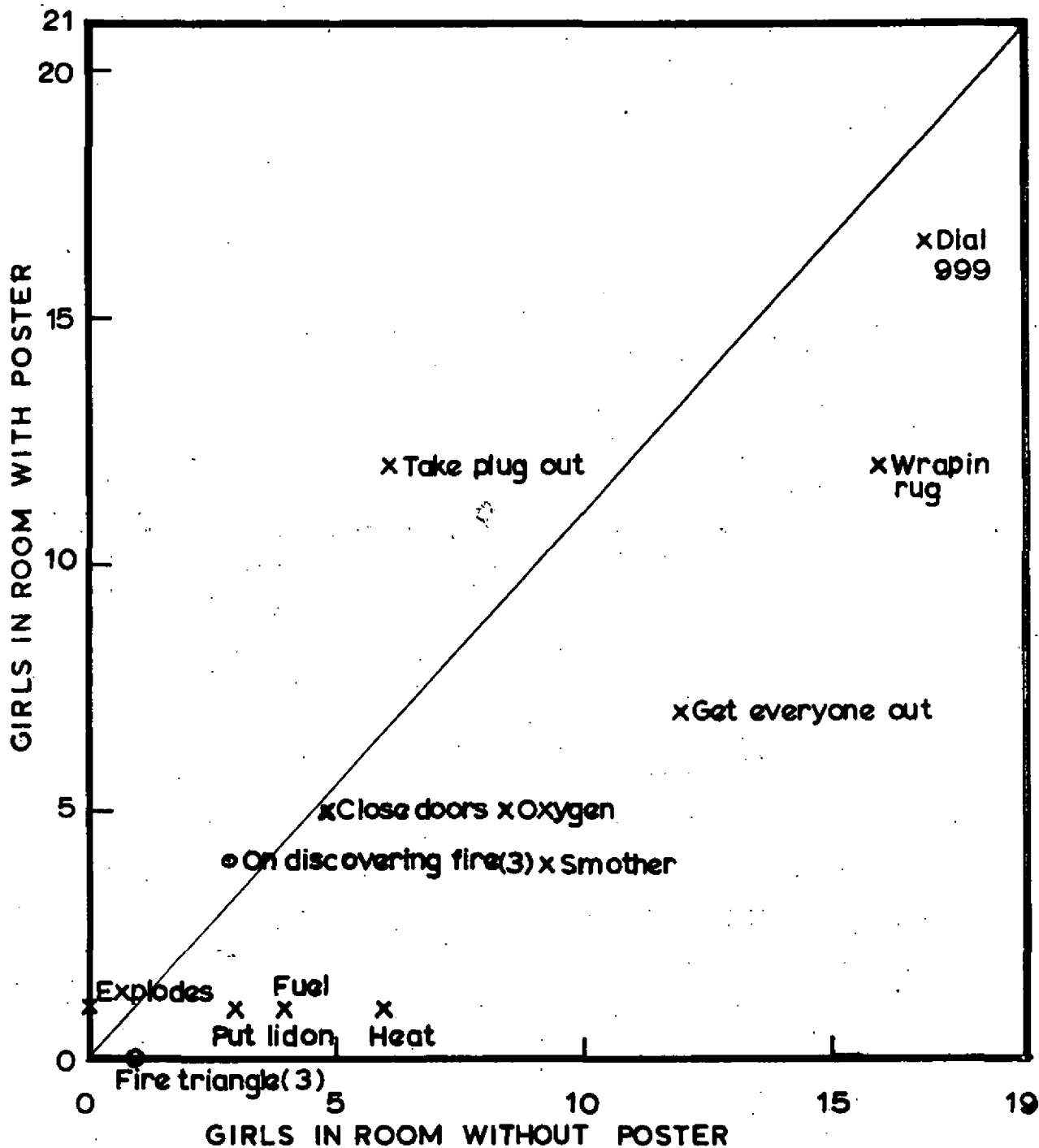


FIG.3. NUMBER OF CORRECT ANSWERS BY 19 GIRLS IN ROOM WITHOUT POSTER VS NUMBER BY 21 GIRLS IN ROOM WITH POSTER

FR. 636 (1704)

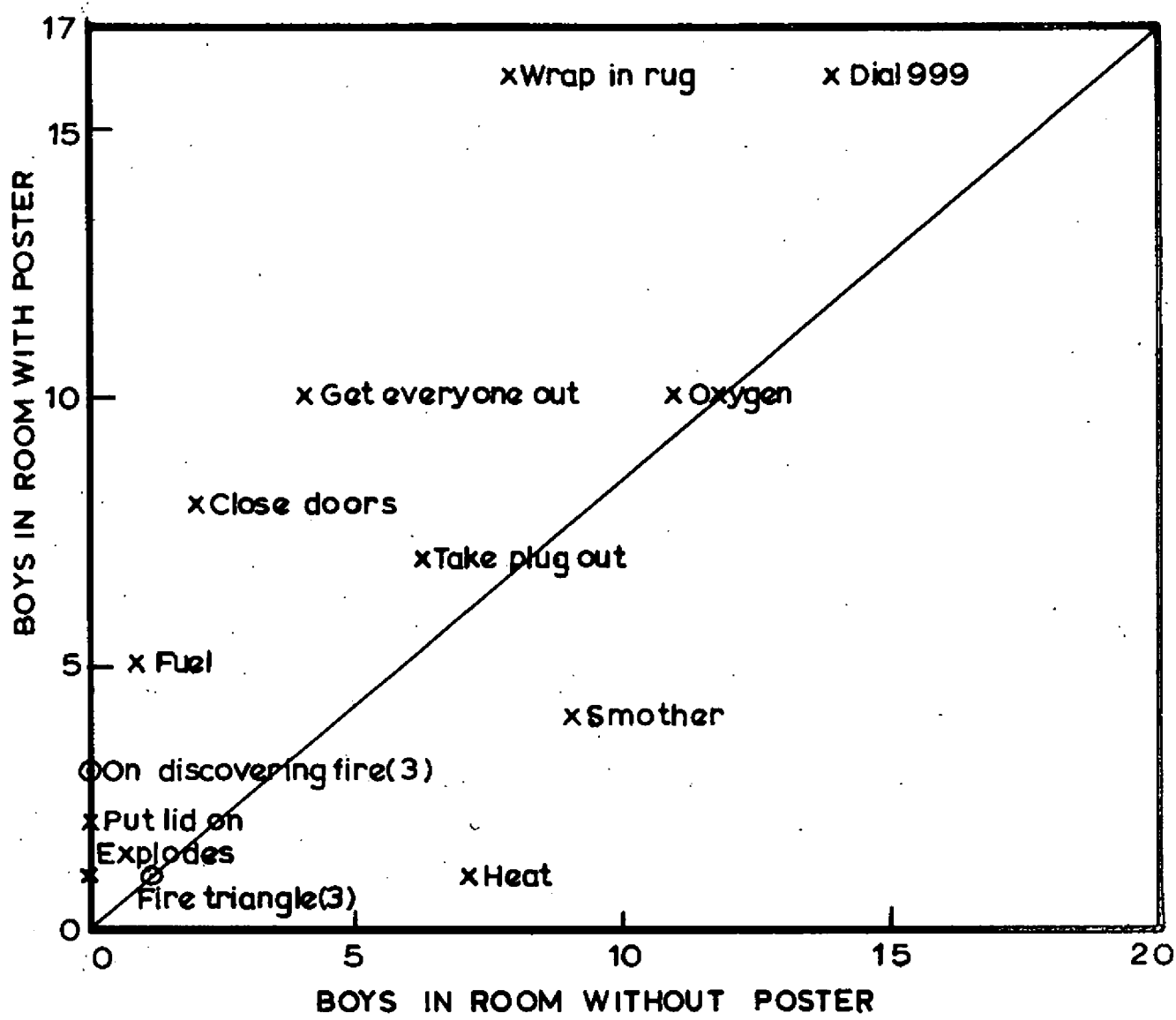


FIG.4. NUMBER OF CORRECT ANSWERS BY 20 BOYS IN ROOM WITHOUT POSTER VS NUMBER BY 17 BOYS IN ROOM WITH POSTER

FR 636 1/7042

