

FIRE-SETTING AS NORMAL BEHAVIOUR

FREQUENCIES AND PATTERNS OF CHANGE IN THE BEHAVIOUR OF 7-16 YEAR OLD CHILDREN

RESEARCH REPORT P21-147/96

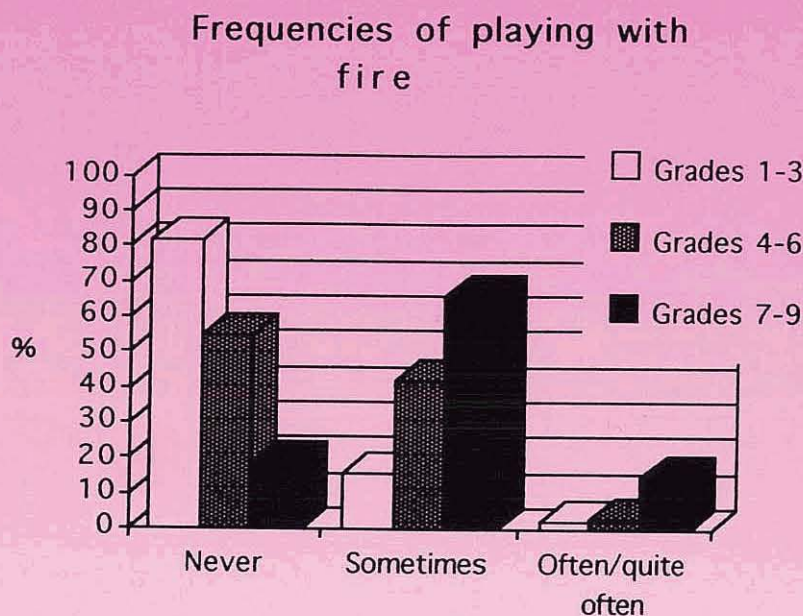


Fig. 1. Frequencies of playing with fire (percentage of the children).



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FIRESETTING AS NORMAL BEHAVIOUR
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The results and conclusions presented in this report
are those of the authors

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Fire-Settings as Normal Behaviour:

**Frequencies and Patterns of Change
in the behaviour of 7-16 Year Old Children**

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Summary

The study showed that children and young people who set fires for mischief do not do so simply for reasons of circumstance. Close connections were found between the frequency of self-reported playing with fire, the motives for this and the self-image. A group of 6-16 years old subjects (n=736) was studied. Those subjects who indicated in a questionnaire that they frequently set fire to things tended to also have a negative self-image as assessed by the self-evaluation scale "I think that I am". A feeling of incompetence seemed to be a common underlying cause of the most intense fire-setting. An interesting result obtained was that pupils in the final three years of their compulsory school education who set fires most and displayed a low general self-image, evaluated their relationship with peers as being normal. Those pupils who declared that they set fires because they liked to "see things burn" or because they were "bored" were those who lit fires most. Those who do not think that any of the reasons suggested in the questionnaire were applicable (want to see things burn; are bored; want to destroy things) and who gave "another reason" seemed to set things at fire out of pure curiosity, in order to study and understand the phenomenon of fire. The latter subjects used fire in more constructive situations, e.g. with their parents, and displayed a more positive self-image than other pupils. It appeared important that parents take responsibility for their children's obtaining experience with fire and provide opportunities for it, as suggested by the finding that the children with a negative self-image reported that they were allowed to light fires without their parents being present. Still another element in fire-setting was that pupils who claimed they would try to put out a fire themselves instead of calling for help were those who lit fires most and had the most negative self-image. The results pointed to fire-setting, particularly when intense, being an expression of a sense of incompetence and of being an outsider, and to the need that preventive measures involve the attempt to keep playing with fire from becoming a way of expressing these feelings.

INTRODUCTION

Fire-setting by children and adolescents is a serious and increasing problem in terms of costs for society (Home Office, 1988; Andersson, 1995). Research indicates that accidental fire-setting, in particular, is a common phenomenon not restricted to children known for delinquent or anti-social behaviour. Kolko (1985) found that 11% of those apprehended for fire-setting were below 10 years of age. In Sweden it has been estimated that 36% of the fire-setters are below the age of 15 (Andersson, 1995). Even small children may start fires, for example when playing with matches (Gaynor & Hatcher, 1987). In a retrospective interview study of 99 boys, 5 to 10 years of age, Kafry (1980) found that 18% of all the fire-setting reported had occurred before the age of 3. It appears that a contributing factor is small children's inability to control a fire once it has started, in combination with fear or with panic reactions.

Many studies have shown that fascination with fire is a universal phenomenon which develops very early. It becomes obvious at the age of 2 or 3, when most children find pleasure in watching a fire and in starting one when the opportunity arises, playing with matches being the typical example of this. Kafry (1980) found that 45% of her sample of boys played with fire, an activity which decreased at around the age of 7. However, there was no corresponding decrease in their interest in fire. This was an observation later replicated by Wooden and Berkey (1984). In line with such findings, Fineman (1989) argues that the typical child fire-setter is a 5-10 years old boy who comes from a stable family and starts fires out of curiosity. He maintains that inquisitiveness, an inclination to experiment, and the lack of parental guidance in these matters are the main causes of fire-setting in children at this age.

An important conclusion to be drawn from this research is that many or most children possess the psychological qualifications to become fire-setters. However, since only few children are involved in serious and repetitive fire-setting, factors contributing to it need to be identified. Factors of this sort may be elements in normal development, such as an investigative, experimental orientation or they may be expressions of psychosocial deviancy. The *absence* of protective factors, such as the possession of adequate knowledge concerning which materials are flammable or having the possibility of learning how to handle a fire, may also be important.

Deliberate, as opposed to accidental, fire-setting in children has been shown to be associated with psychological stress caused, for example by family difficulties or by school problems. With some exceptions (Gaynor & Hatcher, 1987), deliberate fire-setting is not clearly related to antisocial behaviour until about 11 years of age (Jacobson, 1985; Kosky & Silburn, 1984). An additional factor associated with fire-setting is an impoverished ability to experience and express emotions (alexithymia, Sifenos, 1973). Bumpass et al. (1983) found this to be a characteristic feature of 29 children who had been apprehended for multiple fire-setting. They concluded that

emotions, elevated to unbearable levels in these children, were released by the act of setting a fire (cf. Wiklund, 1983). Specific factors associated with fire-setting include deficient impulse control, hyperactivity, aggressiveness, limited ability to relate positively to age-mates, and various behavioural disorders (Forehand et al., 1991; Heath et al., 1983; Jacobson, 1985; Kolko & Kazdin, 1989, 1991). Hyperactive children have been found to run a greater risk than non-hyperactive of being involved in conflicts that result in fire-setting out of revenge (Andersson, 1995; Kolko, 1985). Kafry (1980) found, for example, in a study of small children, that those who played with matches, were more aggressive, mischievous, adventurous, impulsive, and accident-prone than those who did not. Hyperactive children also easily become bored, which is another motive for seeking excitement through fire-setting (Clarke, 1981). Fire-setting as an expression of neurotic conflict has been described as well (Wooden & Berkey, 1984).

To sum up, previous research suggests that rather diverse psychological features all increase the risk of fire-setting in children. Although the single fire-setter may not differ appreciably from a child who has no record of setting a fire, there appears to be a gradual increase in the risk of fire-setting as the strength of such features increases.

Risk- versus protective factors in relation to fire-setting

To a large extent, our knowledge of fire-setting by children has accumulated in studies of multiple fire-setters admitted to psychiatric care or repeatedly apprehended by the police (Kolko, 1985). However, the results thus obtained can not necessarily be generalised to non-clinical groups. Furthermore, in such an approach risk factors are focused upon and factors which have a protective influence on the individual are neglected. We would argue for a number of reasons, that a one-sided "pathogenic" approach to fire-setting should be complemented by a "salutogenic" approach. First, since there is an almost universal interest among children in playing with fire, most children acquire "healthy" attitudes towards fire whereas few children become future potential fire-setters. Secondly, protective factors can be expected to interact with risk factors in complex ways which must be untangled if the early identification of children at risk and the success of large-scale intervention programs aimed at preventing fire-setting in unselected groups of children are to be adequately facilitated. Thirdly, in view of the marked psychological changes which occur at various stages of development in perfectly normal children, those factors which promote and those which prevent fire-setting can be expected to change accordingly, from dominance to latency, at different stages of development. In order to unravel the processes involved, children of different ages should be studied regarding their attitudes and behaviour towards fire.

In view of the strong societal interest there has been in problems of fire-setting and the extensive research directed at it, our knowledge of what are normal and what are deviant attitudes and behaviour towards fire in children at different stages of their development is unsatisfactory indeed. What proportion of children play with fire and in what ways? What normal

developments occur in this respect? Do some children tend to deviate already at early stage from such a general course of development displaying signs that can be identified as predictors of more serious fire-setting? We were unable to find in the literature any systematic attempt to trace the aetiology of fire-setting in the population of normal children and adolescents. The overall aim of the present study was thus to chart the extent and the character of playing with fire and of fire-setting in children and adolescents who were not known to the police or to social services for any abnormalities in this respect. We focused accordingly on normal behaviour as seen in a developmental perspective. Due to the marked limits in the knowledge available, the study must be regarded as exploratory.

METHOD

Subjects

Some 736 pupils from 3 different schools in an average-sized city in central Sweden participated. They were recruited from 3 areas, one of these dominated by single family houses, one by apartment houses, and one being a mixed area. Thus, a variety of social backgrounds was represented. The children were between 7 and 16 years of age, there being 70-90 children from each of the first 9 school grades (these are the grades which compulsory education in Sweden comprises), there being 316 girls and 420 boys in all (Table 1).

Table 1. Distribution of participants in terms of school grade and gender. The children in grades 1 to 3 were 7-9 years of age, those in grades 4 to 6 were 10-12, and those in grades 7 to 9 were 13-16 years of age.

	Grades 1 to 3	Grades 4 to 6	Grades 7 to 9
Boys	142	141	137
Girls	92	118	106
Total	234	259	243

Instruments

An *Attitudes toward Fire Questionnaire (AFQ)* was constructed concerning the following areas: frequency of play with fire, including the lighting of matches and of candles; attitudes towards fire (e. g. of experiencing it as, exciting, scary or cosy); motives for playing with or starting fires (e. g. feeling bored, being angry, wanting to see it burn, wanting to destroy something, not knowing why); reactions after having started a fire; damage, if any, of fires the child started; knowledge of what materials are flammable. Three forms of the questionnaire were constructed, adapted to each of 3 different levels in school: grades 1-3 (7-9 years), grades 4-6 (10-12 years), and grades 7-9 (13-16 years). There were fixed response alternatives to all the questions and

also open response alternatives to some of them. Preliminary versions of the questionnaire were tested in several classes and were thereafter revised.

The "I Think I Am" *Self-Evaluation Questionnaire (SEQ)* (Birgerstam-Ouvinen, 1984, 1985) quantifies aspects of self-attitude in 7-16 year old children. It consists of statements the child is to accept or reject. Five different aspects of self-esteem have been identified on the basis of factor analysis: physical characteristics, skills and talents, psychological well-being, relation to parents, and relation to others. In addition, a total score is obtained. Previous studies have shown the SEQ to have adequate psychometric properties. The results obtained with the SEQ are to be presented elsewhere.

RESULTS

Playing with fire and fire-setting among children

Of the 736 children, 255 (35%) reported playing with fire fairly often and 50 children (7%, 20 girls and 30 boys) often or quite often (in grades 7-9, "every week" or "every day") (Figure 1).

The number of children who played with fire increased by a factor of 5 in the final 3 years of school as compared with the first 3 years, at the same time as the group who never played with fire decreased from 80% to 20%. Gender differences at the different stages are for the most part non-significant (figures 2, 3, 4). Only among the 10-12 year old children is there a significant gender difference, the girls playing notably less often with fire than the boys.

Ninety percent (210) of the children in grades 1 to 3 (7-9 years of age) reported being permitted to use fire in the presence of an adult, 11 children (5%) being allowed to use fire even if no grown-ups were nearby. Four of the children (2%) did not know when or whether they were permitted to use fire. Twenty-five of the children (11%) in this age group reported that they played with fire on their own regardless of whether they had permission or not.

What is set on fire?

Sixty-three of the children (56 boys and 7 girls) in grades 1-3 and 4-6 played with fireworks often or quite often and 97 of the children in those grades (60 boys and 37 girls) lighted candles often or quite often.

More than half of the total group of children (54%, n=397) reported that they had set fire to some object. There were distinct differences between the age groups. Among the youngest children (7-9 years old), 56 (24%) had actually set something on fire. Corresponding numbers for the children 10-12 and

Frequencies of playing with fire

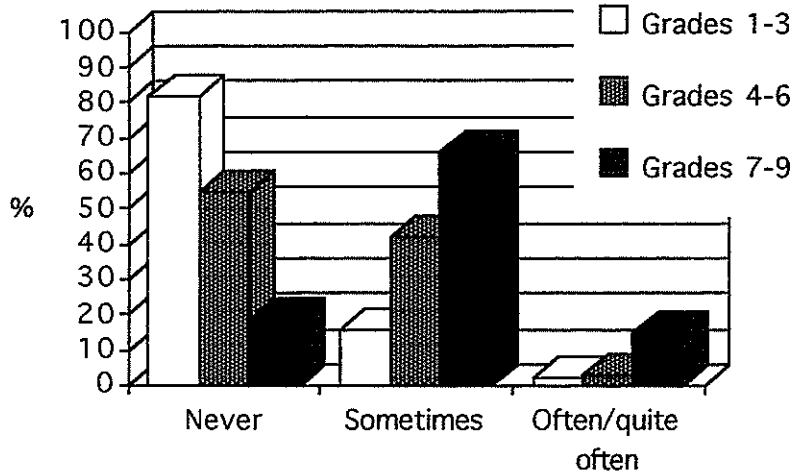


Fig. 1. Frequencies of playing with fire (percentage of the children).

Frequencies of playing with fire for the 7-9 year old boys and girls

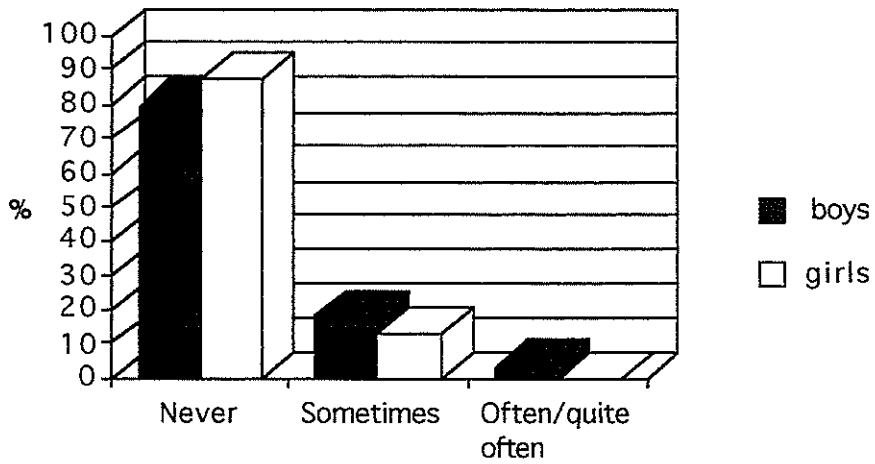


Fig. 2. Percentages of the girls (N=92) and the boys (N=142) 7-9 years of age (grades 1 to 3) who played with fire.

Frequencies of playing with fire for the 10-12 year old boys and girls

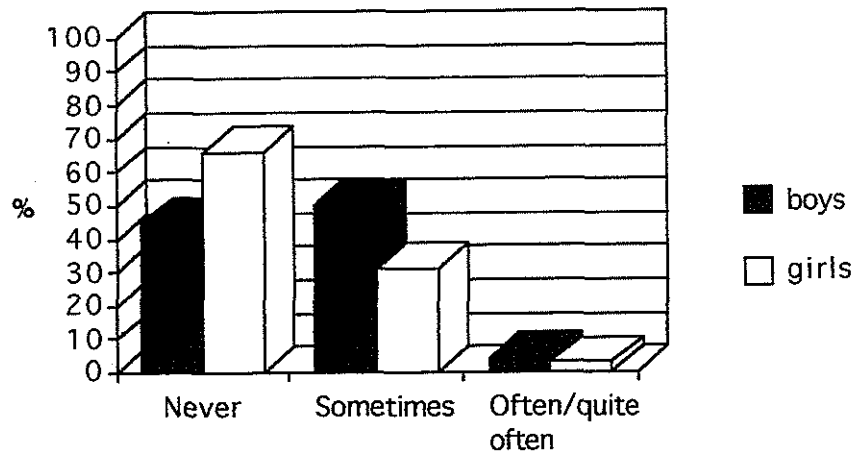


Fig. 3. Percentages of girls (N=118) and of boys (N=141) 10-12 years of age (grades 4 to 6) who played with fire.

Frequencies of playing with fire for the 13-16 year old boys and girls

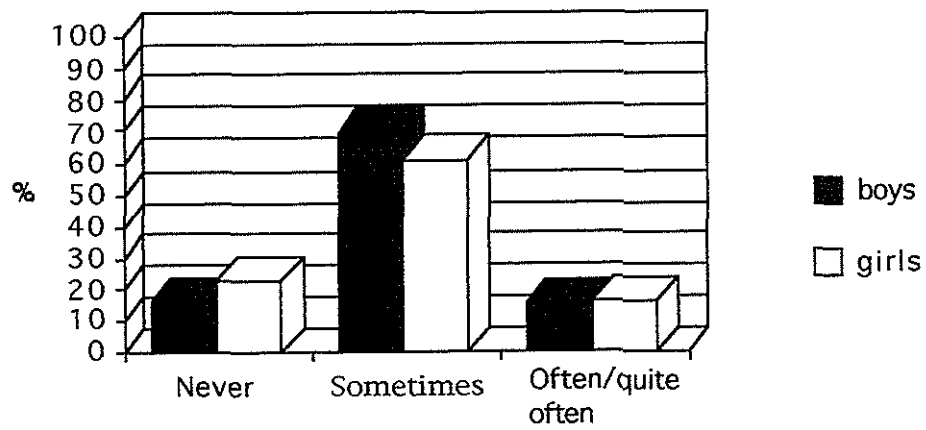


Fig. 4. Percentages of girls (N=106) and of boys (N=137) 13-16 years of age (grades 7 to 9) who played with fire.

13-16 years of age were 60% (156 children) and 76% (185 children), respectively. A total of 320 children (43%) indicated that they at one time or another had lit paper, leaves or grass. Thirty-nine of the children indicated having lit wastebaskets. Among the children of ages 10-16, 3 reported that they had set fire to buildings and 122 (24%) that they had set fire to things of their own. A total of 130 (18%) reported that they had lit "other objects" (Table 2).

A categorisation of the children's descriptions of the objects that were set on fire revealed sticks, firecrackers, playingcards, plastic building blocks, and newspapers to be the most popular objects at the ages of 10-12. At the age of 13, socks, plastic building blocks, gas and pencils were the most common objects or substances, whereas jeans, toys, things of plastic, gas and sprays dominated at the ages of 13-16.

Table 2. Reported frequencies of objects put on fire in grades 1 to 3 (ages 7-9), 4 to 6 (ages 10-12), and 7 to 9 (ages 13-16) .

Object	Grades 1 to 3		Grades 4 to 6		Grades 7 to 9	
	boys n (%)	girls n (%)	boys n (%)	girls n (%)	boys n (%)	girls n (%)
Paper or leaves	36 (64)	6 (46)	74 (50)	35 (62)	114 (47)	23 (33)
Waste-basket	0	0	12 (8)	2 (4)	20 (8)	5 (7)
Own objects	*-	*-	32 (21)	8 (14)	57 (24)	25 (36)
Building	*-	*-	1 (1)	0	1 (1)	1 (2)
Other objects	20 (36)	7 (54)	29 (20)	11 (20)	48 (20)	15 (22)
Sum	56 (100)	13 (100)	148 (100)	56 (100)	240 (100)	69 (100)

* - This category of answer was not included for grades 1 to 3.

Damage done

The question of the damages caused through playing with fire exposed clear differences between the age groups 10-12 versus 13-16. The younger children seemed primarily to light objects indoors whereas the older ones, and especially those 14-16 years old, mainly set fire outdoors and in nature.

Twenty-eight children 10-12 years of age reported that they had caused damage in playing with fire. In 6 instances damage was to furnishings such as carpets and tablecloths, and in another 10 instances to petty things such as toys, cartons, paper and plastic goods. Six children had also injured themselves, mainly by unintentionally setting fire to their hair or burning their fingers. Only 3 children in this age group reported damage to nature

(trees or heather). One child had damaged a car and 2 children reported causing damages but were unwilling to reveal the objects. In one of these instances the fire brigade had extinguished the fire.

Of the 56 youths (13-16 years) who had caused damages through fire, 34 reported damages to nature. In 21 instances grass and leaves were damaged, and in 13 instances woods, trees, and bushes were damaged. Only 6 children reported damage of petty things and 7 injuries to themselves. Six had damaged wastebaskets or boxes and in one instance a shed had burned down.

A total of 53 children (42 boys and 11 girls) had on at least one occasion lost control of the fire, being unable to extinguish it. The majority of these children were 7-9 or 13-16 years old. Seventeen children (13 boys and 4 girls) aged 7-9 years had got help in extinguishing the fire, 1 boy and 1 girl had got help from friends, 5 boys and 2 girls had been helped by grownups and 1 girl reported that the fire brigade arrived.

Ten children aged 10-12 had lost control of a fire they had lit. Six of them were boys and 4 were girls. All the boys had been helped by friends and all the girls by grownups.

Twenty-six youths aged 13-16 years (23 boys and 3 girls) had at least once needed help to extinguish a fire. Seventeen boys and 2 girls had got help from friends, 3 boys and 1 girl had got it from grownups and 3 boys reported that the fire brigade had extinguished the fire.

Motives

The motives for setting fire differed considerably for both the boys and the girls and for the different age groups (table 3). Each child was allowed to name several motives.

The majority of both the boys and the girls 10-12 years of age (grades 4 to 6) were unable to name their motives whereas as many as half the boys aged 13-16 (grades 7 to 9) reported as their major motive that they wanted to see it burn (figure 5, 6).

Table 3. Motives for fire-setting in grades 4 to 6 and 7 to 9. Reported frequencies.

Motive	Grades 4 to 6		Grades 7 to 9	
	boys	girls	boys	girls
Want to see it burn	28	3	70	17
Want to destroy	* -	* -	13	11
Am angry	4	5	10	10
Am bored	17	7	35	26
Another reason	* -	* -	21	8
Do not know	53	28	22	7

*- This category of answer was not included for grades 4 to 6.

Motives for fire-setting in grades 7 to 9

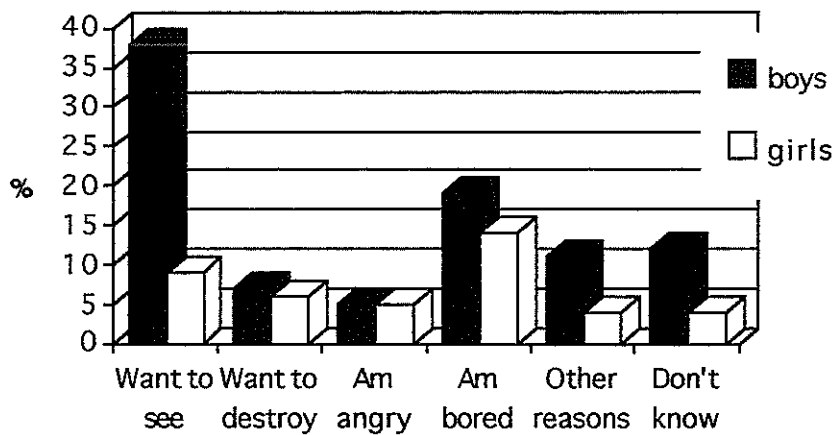


Fig. 5. Motives for setting fires in grades 7 to 9 (ages 13-16). Percentages of girls and boys who reported the motive in question.

Motives for playing with fire in grades 4 to 6

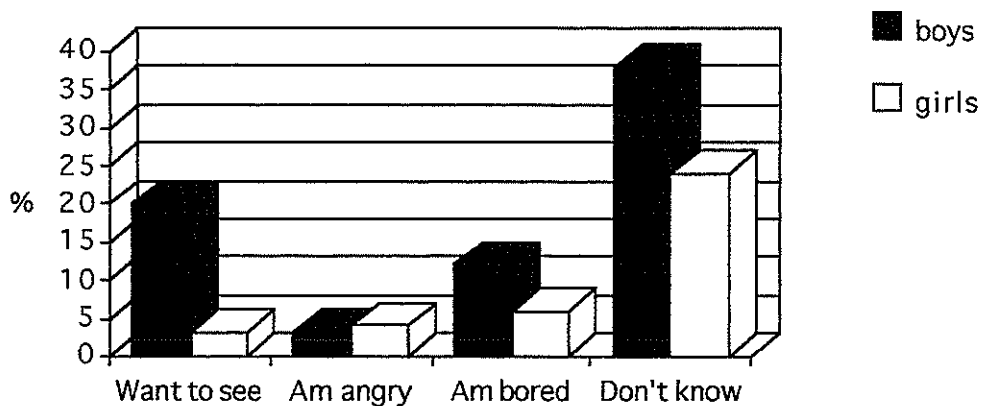


Fig. 6. Motives for setting fires in grades 4 to 6 (ages 10-12). Percentages of all the girls and boys, respectively.

Attitudes

Of the 736 children 263 (36%) reported experiencing fire as exciting, 188 (26%) experiencing it as frightening and 456 (60%) as being nice and cosy (table 4).

Table 4. Attitudes toward fire. Grades 1-3, 4-6, 7-9. Observed frequencies. Percentage of the total number of girls and boys, respectively, per age group.

Attitude	Grades 1 to 3		Grades 4 to 6		Grades 7 to 9	
	boys	girls	boys	girls	boys	girls
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Exciting	75(53)	17(18)	63(45)	29(25)	60(44)	19(18)
Frightening	24(17)	23(25)	37(26)	45(38)	19(14)	40(38)
Cosy, nice	107(75)	75(82)	116(82)	94(80)	58(42)	63(59)
Uninteresting	* -	* -	* -	* -	33(39)	21(20)

*- This category of answer was not included for grades 1 to 3 and 4 to 6.

The percentages exceed 100 per age group since the children can select more than one alternative.

Knowledge and competence

In grades 1 to 3 and 4 to 6, 303 children (61%) reported that their parents had taught them how to handle fire. In the first 3 grades 85 children (33%) reported that they had learned to handle fire at school.

Forty-seven children (18%) in grades 4 to 6 believed that rubber and/or chalk are materials that are easy to set fire to. Eleven children (4%) had no idea of what materials burn easily and were therefore unable to answer the question. Thus, 22% showed insufficient knowledge in this regard. Twenty children (8%) knew that jeans burn easily whereas 150 (58%) knew that bark is inflammable, 31 (12%) answered both bark and jeans.

The frequency distributions for the same questions in grades 7 to 9 (ages 13-16) are as follows: chalk or rubber 54 (22%), don't know 15 (6%), jeans 22 (9%), bark 98 (40%), both jeans and bark 54 (22%). Thus, the older children did not seem to have much better knowledge of the flammability of different materials than the younger children (aged 10-12) did.

Another question that was asked concerning their knowledge or their competence was what they would do first if they saw a tree burning. Sixty-six (27%) of the children in grades 7 to 9 answered that they would try to extinguish the fire themselves, 77 (32%) that they first would shout for help and 100 (41%) that they would call for the fire brigade. Corresponding

figures for the pupils in grades 4 to 6 were: 44 (17%), 89 (34%) and 126 (49%). Eighty-six (37%) of the youngest children (7-9 years of age) stated they would shout for help, 13 (5%) that they would try to extinguish the fire themselves and 135 (58%) that they would call for the fire brigade.

DISCUSSION

The study showed that 42% of the children in grades 1 to 9 played with fire. At the same time it appears that this figure does not provide a completely correct reflection of reality being somewhat low. Actually more than 50% of the children reported that they had put something on fire. A possible artefact is that those younger children, who knew the dangers of fire, may not have wanted to admit playing with it (Kafry, 1980). The fact that children less than 6-7 years of age are not included in the study should be noted since playing with fire is known to decrease at around the age of 7 (Block et al. 1976; Kafry, 1980).

Although the youths in grades 7 to 9 seemed to know why they set fire to things their reports differed from what is generally known to be the foremost motive among youths who set fire, namely an urge to destroy - a motive which may well dominate among youths who are caught for setting fires. In the present group of pupils in the upper grades the most recurrent motive given was that they wanted to see it burn. Destructiveness did not seem to be a basic motive. This may indicate that active children use fire as a means of becoming stimulated. It may also indicate that it is important to differentiate between the desire for stimulation or activity and its detrimental form of expression i.e. vandalism or an urge toward destruction.

The fact that the majority of the children aged 10-12 who set fires did not know why they did so, implies that impulsive behaviour, governed by external factors, direct their actions at this age. This may further indicate that certain fire-related habits are established during preadolescence, a period which thus seems to be important for efforts to influence how children relate to fire.

Activity as opposed to destructiveness is a factor which appear to play an important role. The damages caused by playing with fire seem, in most instances to have been insignificant, not indicating any strong urges to destroy. Also, the objects ignited appear mainly to have been petty things.

Playing with fire changed in character when the children reached the age of 13-14. The frequency of fireplay increased by a factor of 3 compared with the ages 10-12. Furthermore, fires tended then to be set outdoors instead of indoors which was the case for the younger group. One explanation of this could be the advent of puberty. Both areas of interest and habits gained through socialisation change radically during this period. The results

obtained confirm the importance of informing preadolescent children of matters related to fire.

Knowledge of fire and of the flammability of different materials was remarkably deficient. The fact that this knowledge did not improve appreciably between the ages of 10 and 16 is rather alarming in view of the qualitative as well as quantitative changes of playing with fire which occur during this period.

Even if knowledge and competence concerning fire does not increase much during this period, feelings of competence seem indeed to increase. This is suggested by the increase in the numbers of youths at ages 13-16 years as compared with ages 10-12 who declared that they would themselves try to extinguish a fire in a tree rather than call for help. This can also indicate a lack of comprehension of the dangers connected with fire as well as of how rapidly a fire can progress.

We conclude therefore that both children and youths need not only to be taught to extinguish fires but also to use fire in a competent and safe manner.

Seven percent (53) of the children had at least once lost control of a fire they had lit. This hints at the number of near-accidents there may be and at the risks involved.

The results of this study would apply to children and youths in other comparable surroundings, above all in middle-sized Swedish towns. It should be noted that the frequency of playing with fire is apparently greater in large cities and less in the countryside. The motives for playing with fire can be assumed to be similar, however, regardless of surroundings. Attitudes, on the other hand, could be expected to be more functional in the countryside than in the cities.

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