Fire Research Report

Fire Safety as an Interactive Phenomenon

Victoria University of Wellington

February 2001

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The research is based on a two-step process where (1), residents were interviewed in their own homes about the fire safety features and risk factors there and (2), fire fighters conducted a fire-safety assessment of the resident's home. The research does not aim to directly assess the level of fire-safety in research participants' homes, or to consider whether residents and fire fighters were 'right' or 'wrong' in their views about particular households and safety practices. The focus is on how lay and expert knowledges intersect and interact within actual practices.

The research highlights the complexity of the interactions when fire fighters talk with residents about fire safety in their own homes. In the course of the research, fire fighters built rapport with residents, used humour, shared their experiences of house fires, talked about fire safety in their own homes, passed on specific information about fire prevention and detection methods, and paid attention to the risks associated with each particular household. Some aspects of the process opened up interaction between fire fighters and residents, while other aspects involved less engagement.

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Executive Summary

This research works from a sociological perspective which understands fire safety in terms of a 'translation model'. According to this model, fire safety knowledge is continually re-created, transformed and adapted in the social contexts where it is used. That is, conceptually, fire safety knowledge is something that must be *made* effective in the social worlds where fires take place.

This research focuses on the New Zealand Fire Service's attempts to increase domestic fire safety by making households better fire-prepared. It uses a qualitative inductive methodological stance where the objective is to gather data as close as possible to 'naturally occurring' human interaction. The aim of the data analysis is both to present fine detail and to identify overall patterns.

The research is based on a two-step process where (1), residents were interviewed in their own homes about the fire safety features and risk factors there and (2), fire fighters conducted a fire-safety assessment of the resident's home. (It was decided by NZFS employees that the key workers involved in the research would be operational staff (fire fighters), because domestic fire prevention is becoming an increasingly important aspect of fire fighters' roles.) The interviews and fire safety assessments were audiotaped and transcribed in full. The research does not aim to directly assess the level of fire-safety in research participants' homes, or to consider whether residents and fire fighters were 'right' or 'wrong' in their views about particular households and safety practices. Nor is the aim to offer criticism of employees of the NZFS. The focus is on how lay and expert knowledges intersect and interact within actual practices.

A diverse group of research participants were sought through a variety of community groups and through Student Job Search. Thirteen households participated in the research project and interviewees ranged in age from their early twenties to over sixty. Of the households, eight were owned and five were rented. Five of the households were identified as including people who may have difficulty detecting or escaping from a fire, due to physical constraints. The number of residents per household ranged from one to six, and cultural groups in each household were identified as Pakeha (nine households), Maori and Pakeha (two households), Malaysian Chinese (one household), and Indian (one household).

The research highlights the complexity of the interactions when fire fighters talk with residents about fire safety in their own homes. For some fire fighters, this task was seen as part of their usual role, whereas for others it was seen as unusual and experienced as uncomfortable. Fire fighters' work involves domestic fire prevention, but this research shows that how each fire fighter, and each crew, carried out this aspect of their work varied considerably. The analysis of transcripts points to elements that work well and to others that are not so effective in fire fighters' interactions with residents.

In the course of the research, fire fighters built rapport with residents, used humour, shared their experiences of house fires, talked about fire safety in their own homes, passed on specific information about fire prevention and detection methods, and paid attention to the risks associated with each particular household. Some aspects of the process opened up interaction between fire fighters and residents, while other aspects involved less engagement.

This research highlights the following aspects of interaction between residents and fire fighters as useful for increasing domestic fire-safe practices:

- Building rapport, by being sensitive about the number of uniformed people walking through the home, by using humour, and by carefully tailoring the message to the audience.
- Telling stories, by drawing on their experience as fire fighters, by enabling residents to envisage a fire in their home and think about how they could be better prepared for fire.
- Using visualisation and role play, by encouraging residents to step themselves and their families/flatmates through an escape drill.

The research identifies as potentially less useful, the following aspects of interaction between residents and fire fighters:

- Listing fire-safety points, thereby making the fire-safety message sound repetitive and uninteresting.
- Extending the focus of the assessment to offer safety-advice that was unrelated to fire safety.
- Using language that may alienate the resident, by referring to 'general housekeeping' as a safety/risk factor, or making culturally based assumptions about residents and their behaviour.

The findings of this research present the NZFS with opportunities to develop ways of translating fire safety knowledge to ensure residents are better fire-prepared. A clear opening for this is to extend the current practice of installing smoke alarms in homes to

include a fire-safety discussion tailored for the particular residents and their dwelling. Another opening for development is offered by the diversity and creativity of fire fighting crews. Examples of good practice in one geographical location can be passed on to crews in other locations. Furthermore, consideration could be given to developing a specialised aspect of fire fighters' role whereby some members of each crew are specifically trained and equipped to talk with residents about fire safety in their own homes.

There is no complete answer to the question of how to improve fire safety. Attempts to improve residents' fire-preparedness depend on complex relationships; fire fighters and their safety knowledge are only one component. This research focuses on how this component works in practice: in the interaction between fire fighters and residents there are factors that may better contribute to domestic fire safety. This research has been relatively small in scale, but has produced a detailed picture of the complexity of fire safety; further research is recommended to build upon and further investigate fire safety as an interactive phenomenon.

1. Background: Topic and Theoretical Framework

This research investigates fire safety from a sociological perspective. That is, we claim that central elements of fire safety - knowledge and practice - are social phenomena, and hence can be investigated from a sociological viewpoint. We use what has been called a 'translation' model of safety knowledge (Gherardi, Nicolini & Odella, 1998; Gherardi & Nicolini, 2000). Under this model, safety knowledge is treated not as a pre-existing entity that must be 'got across', rather it is formulated as something that must be continually re-created, transformed and adapted in the social contexts in which it is put into use. Specifically:

- knowledge is situated in a system (or organisation) of ongoing practices
- knowledge is formed in, by, and through, social relations
- knowledge is acquired by means of social participation
- knowledge is dynamic and provisional

Such a stance does not directly question the validity of expert knowledge on the causes of fires or on the preferred means of reducing fires, rather it asks how fire safety knowledge is made effective in the social worlds where fires take place. We follow Gherardi et al. in making the 'assumption that people in organisations do not learn 'safety'; rather, they learn safe working practices' (1998: 202).

The particular focus of this research is on household fires and the New Zealand Fire Service's attempts to reduce such fires by making households better fire-prepared. Given this focus, four important elements can be delineated: i) the New Zealand Fire Service as an organisation, which ii) employs operational staff whose job is both to fight fires and to promote safety in iii) households, where iv) residents live. Three of the elements are individuals or groupings of individuals, whilst the household is the material-physical space where fires may occur. We are interested in the causal aspect of fires in material-physical space insofar as it involves the actions and determinations of the individuals or groups.

Without offering an extensive literature review, we suggest that social scientific knowledge on risk and safety tends to fall into two dominant camps. The first has a psychological or individualistic focus, the second some version of a holistic focus on structures or organisations. The former tends to see knowledge and safety practices as an aspect of cognition, or some kind of property of individuals[1]. It is a view where particular types of

[1] An often cited exemplar here is the psychologistic 'theory of reasoned action' which has been well critiqued from within psychology (see Stainton Rogers, 1991). For alternative social models of rationality and cognition see: Lave & Wenger (1991); Engestrom & Middleton (1996).

people process knowledge and respond to risk in different ways, according to their psychological makeup, or their social makeup insofar as it also marks them as a particular type of person. On the other hand, the structural or organisational analysis approach tends to see knowledge and practices as an inherently holistic product or property of human organisations. Certain types of organisation or social groups will lend themselves to certain types of risk knowledge and safety practices[2]. This tends to treat individuals as inconsequential, shifting the focus to how broader institutional practices might be re-ordered to reduce risk and improve the dissemination of safety knowledge (see Gherardi, 1999; Law, 2000).

Of course, both these views have relevant things to say about risk in general and fire safety in specific. However, we believe that there are two main problems with these approaches. The first is that the individual and the structural/organisational elements are treated as independent from each other. They are seen as connected but nonetheless autonomous: it is common to picture such processes by drawing each element as a separate 'box', with a single or double-headed arrow indicating causal connections to or from other 'boxes'. Alternatively, if system is emphasised over individuals then individuals tend to disappear and there is effectively only one box: the whole system.

The second problem is that in the research process too many assumptions are made which over-simplify the social worlds within which fires occur. For example, many social scientists will employ a measure of 'socio-economic status' and then look for how differences in this status presumably influence fire-risk and fire-safety. The problem with this is that it tends to obscure complexities and to predetermine answers to research questions. It is well known that analysis of survey data is only as good as the variables that one begins with. Socio-economic status may well prove important, but we always

[2] This is most clearly expressed in Douglas' well known grid/group model. See Douglas and Wildavsky (1982), Douglas (1992); for a critical discussion of this approach see Bellaby (1990).

need to consider whether other important variables have been left out, and to push for further details on just how this variable works in practice. Does the socio-economic status variable simply reflect an inability to buy fire-safety devices, or is it failure to gain and act upon fire-safety knowledge associated with more general educational difficulties?

Ultimately the problems with these two approaches can only be minimised, not removed. In framing this research we would like to emphasise two aspects that help to minimise these problems. In contrast to the either/or model of individuals/structures, our framing of fire safety is one which emphasises complexity and partial connections[3]. By way of elaboration, consider the fact that when there is a household fire we ask what went wrong. The 'autonomous box' approach tries to locate specifics: a person made a mistake, a heater was faulty, and so on. The systems approach treats it as a combination of factors: the faulty actions of an individual are of interest in that the system's knowledge did not get through to them in an effective manner. Following Law (2000), note that each of these explanatory approaches implies a different version of space. In effect, each asks us to think about *where* what went wrong might be located. To 'box' is to think in local or regional terms. A larger area is divided into smaller regions separated by boundaries, and so each household is treated as distinct, as is each room and each person within the household. Hence, on this view the 'where' question is answered by pointing to some distinct place in a virtual map of places and people.

The same question is answered differently in the 'systems' approach. Here space is a type of network or web. Answers to 'what went wrong' are offered in terms of functions and relations: a task was not fulfilled, a connection not made, hence the fire. The important point here is that these two explanatory avenues crossover each other in complicated ways. As Law has put it in discussion of a major British train accident:

> Explanations posed in terms of relations erode the self-sufficiency of pigeon-holes. ('The driver is not really responsible, we need to understand his context'). But they also erode one another because there are many different system logics - or logics working within the system - and these locate things in different ways because they build different webs of relations. In

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[3] The more general source of our 'translation' model is a tradition in sociology known as Actor-Network-Theory. See Law (1992; 1994) for a general statement, and more specifically on safety and accidents see Dew and Lloyd (1997), Lloyd (2000), Law (2000).

> thinking about the causes of the accident this is seen as a difficulty, and there are terms - for instance 'fragmentation' - for talking about that difficulty. And since system thinking is more prominent than the regional alternative, in the wake of the disaster it tends to become urgent to repair the system, to put it back together again, to ensure that there is a single logic, a single functional answer to the question of location. The assumption is that things would stay in place if there were better train protection systems, better systems of management, better systems for training, better designed signal gantries, better track layouts, and all the rest. (2000: 13)

Clearly, such an argument is equally applicable to fire-safety. In answer to the 'what went wrong' question, an emphasis on individuals as 'boxes' will not sit easily with an emphasis on system logic, or indeed multiple system logics. Law's conclusion is not to take sides but to recognise complexity. While thinking either in terms of boxes/pigeonholes, or in terms of systems, has its uses, it is going to fail to adequately picture the messiness of the social world. Matters are too complex; things can never be fully located either in regional or relational terms.

The broader point to take here is that we need to see 'individual' and 'system' as operating at the same time, but without assuming that the connections between them can be completely mapped for now and all time. They *are* connected, but never in a single, fixed manner. Particular connections amongst people, place and system will be deemed to produce a fire-prepared household, or alternatively an at-risk household, but even when these connections produce 'good' (or stable) answers to fire safety questions, the task still remains to put such knowledge into practice for the very next household and its inhabitants. This is why we say that fire safety is an interactive phenomenon. Or, to put it another way, a safety culture is a 'community of practice' (Gherardi et al., 1998).

Consistent with this theoretical framework, it must be emphasised that the results of our attempt to picture the complexity of fire-safety must always be modestly presented. We do not have the full picture, nor the full answer. That said, there are more or less convincing pictures, and our aim is to produce as convincing a picture as possible. In

attempting to do this we are adopting an important methodological principle: wherever possible use 'naturally occurring data'.[4] In this research we are adopting a qualitative inductive methodological stance where the objective is not to predict which explanatory factors best explain fire safety behaviour, but to understand how such behaviours always occur in particular contexts as interactive phenomena. The objective is to gather data at a sufficiently detailed level, that is, as close to 'naturally occurring' human interaction as possible, to enable analysis of the complex interactions that constitute fire safety knowledge and action. This point is reflected in the research process undertaken, as described below.

2. The Research Process

The research is based on a two-step process where firstly residents were interviewed in their own homes about their experiences with fire and the safety features and risk factors in their home. The second stage, which followed directly, involved a fire-safety assessment of the resident's home by local fire fighters who presented their assessment to the resident in the presence of the interviewer (Katrina Roen, hereafter KR). The study was approved by the Human Ethics Committee of Victoria University of Wellington.

In the early stages of the research process, we conducted informal interviews and talks with NZFS regional office employees. Through this process, the research focus was framed in terms that relate to the local approach to domestic fire safety. It was decided by NZFS employees who were consulted at this stage that the key workers who would be involved in the research would be operational staff (fire fighters). This was decided on the grounds that domestic fire prevention is becoming an increasingly important aspect of fire fighters' roles.

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[4] No empirical data is unmediated by human activity, hence there is no possibility of capturing raw 'naturally occurring data' (see Silverman, 1993). Nevertheless, if one's interest is in how humans do things together (including fire safety) some forms of data offer more insights than others.

Characteristics of Participants and Method of Recruitment

It was proposed that up to 20 research participants would be interviewed in their homes in the course of this study. Prospective research participants were contacted through a variety of community groups and through advertisements placed at Student Job Search. All eventual research participants lived in the greater Wellington region. The aim in seeking research participants via various means was to access a diverse group of participants.

Upon expressing interest in taking part in the research, participants were sent the information sheet, consent form, and questionnaire (see Appendix 1,2,3). Through the questionnaire, research participants described their households in demographic terms that have been associated with risk of residential fire injury and death. These terms relate to the:

- Genders of residents
- Ethnic or cultural groups of residents
- Number and ages of residents
- Tenant/Homeowner status
- Household income level
- Physical or intellectual disability of residents
- Presence of smokers in the household

Prospective participants continued being contacted, and interviews continued being carried out, until key themes were identified and it was judged that doing further interviews would add little new material to the analysis. This point was reached after thirteen interviews. All interviews were audio-taped and transcribed in full. In addition, the interviewer (KR) took fieldnotes on relevant points throughout the research.

The interview process was in two stages, both of which were audio-taped. The first stage involved a brief (10-25 minute) interview between the researcher and one or two of the residents. Through the open-ended questioning style of this interview, residents were invited to talk about the way they saw their home in terms of fire safety and fire risk. The second stage, which followed directly, involved a fire safety assessment of the research participant's home by local fire fighters. Through this process, research participants were

invited to talk with fire fighters about issues of domestic fire safety. KR audio-taped the fire-safety professionals presenting and explaining the assessment of the household's fire-safety to the household resident, and also asked questions when relevant. This second stage was seen as a key feature of the research as this is where it was hoped that the data would most closely approximate 'naturally occurring interaction'. That is, we saw this step as providing a good indication of how lay and expert knowledge on fire safety come together and interact. As will be clear in the analysis section, this was not entirely borne out, nevertheless we believe it has provided very useful and important empirical data.

Profile of research participants

Thirteen households participated in this research project, and in each household, at least one resident was directly involved in the interview and fire safety assessment. Of those who were directly involved in the interview, there were four men and ten women. Interviewees ranged in age from the 20-25 year bracket to the over-sixty bracket. Of the thirteen households, eight were owned and five were rented. These thirteen households were the homes of fifty people (twenty-five boys/men and twenty-five women/girls). Only one household was described as including someone who smokes. Five of the households were identified as including people who may have difficulty detecting or escaping from a fire, due to physical constraints. In two of these cases, the constraint indicated was the limited mobility of a toddler or baby. The other three cases indicated visual impairment, hearing loss, and the inability (of an elderly person) to walk as potentially impairing a resident's ability to detect or escape from a house fire.

The number of residents per household ranged from one to six, and the number of children per household ranged from zero to three. Five of the households included children, a total of nine of whom were aged below five years, and three of whom were aged between five and nine. None of the households included ten to fourteen year olds, and only three fifteen to nineteen year olds lived in households that were involved in the study. Of the fifty residents, thirteen were in their twenties and sixteen were in their thirties. Only three were described as being in their forties and three were identified as being over sixty.

Of the thirteen households, nine were described as being solely occupied by Pakeha or European people. One Indian family and one Malaysian Chinese family took part in the study. Two of the households were identified as including both Maori and Pakeha residents.

The income estimates of the twelve interviewees who answered that part of the questionnaire suggest a wide range of household incomes, from two households under $15,000, to two households above $100,000. No calculation has been done to establish what these incomes might mean in terms of living conditions (i.e. how many people were being supported on the household income). Nevertheless, our observation of living circumstances and the stated income range suggest that this research is by no means concentrated within households that are specifically more or less well off.

3. Analysis

Introduction: Aims and technical details

Aims

It is not our aim to decide whether a particular household was fire-safe or not, or whether residents and fire officers were right or wrong in their views about particular households and safety practices. We would also like to emphasise that it is not our aim to offer criticism of employees of the NZFS. Where critical comments are offered they should not be taken as concerned with the competency of individuals. As outlined above our interest is a broader one concerned essentially with how lay and expert knowledges intersect and interact within actual practices. That said, there are activities that are well known, both by commonsense and expert knowledge, to be risky. Smoking in bed, or letting children play with matches, would be good examples. Other substantive examples occur throughout the empirical material discussed below, but while at a commonsense level we would accept that these practices are risky, again, we are not making an explicit judgement about why people might engage in these practices. To labour the point, our interest could be expressed as a fairly traditional sociological concern with the relationship between form and content. That is, fire safety involves substantive knowledge (content), but this is always given expression through a social form, there being many forms available. For example, in relation to fire safety, social forms include, recording expert knowledge in academic journals, running media campaigns about installing fire alarms, conversations between fire fighters, or as is the case in this research, the communication of a fire safety assessment by fire fighters to residents.

The following analysis works at three levels. First we aim to provide a general descriptive overview of the empirical material, second, to identify selected themes which have important implications for furthering household fire safety, and third, to focus on selected pieces of dialogue to exemplify the interactive nature of fire safety. These three aims are not chronologically delineated, but are met in various ways throughout the following analysis.

Technical Details

The audiotapes were transcribed by a professional transcriber. The intent in transcribing was simply to accurately represent the conversations recorded. Hesitations, pauses,

inaudible utterances and similar linguistic phenomena have not been included in the transcriptions. The following system of abbreviations has been employed:

- transcriptions of the householder interviews are labelled H1, H2 ... H13
- transcriptions of the fire fighter assessments are labelled A1, A2 ... A13

Within these transcriptions, FF stands for fire fighter, R for Resident, and I for Interviewer. All extracts from transcriptions have been italicised to distinguish them from the main text.

Talking about fire safety: comparative comments

Although it would be possible to conduct a detailed analysis comparing the two sets of recorded conversations - the householder interview; the fire fighter assessment - we would like to offer only minimal comparative comment. This is because a key point quickly became obvious from the data, and there seems to be greater value in a more focused consideration of this point. It is this: in general, the fire fighters seemed uneasy in their role of entering a person's house and offering a fire safety assessment.

Obviously, one must take into account differences in the interactional situations, but overall it is true to say that the householder conversations with the interviewer (KR) proceeded much more easily than the oral delivery of the fire fighters' assessment. Again, we would like to reiterate that in stating this no judgement is being made about the competency of fire fighters. This is simply an important analytical point that we wish to state, in order to then pursue why many fire fighters seemed uneasy in this situation. Note here that while the interviewer is experienced in the role of interviewing, it is still the case that having an academic researcher in one's house is an 'artificial' situation. Both the householder and the interviewer had to work at successfully accomplishing an interview, and, without exception, the interviews were indeed successfully accomplished: information about personal details was given over; questions and answers were exchanged in free-flowing discussion; and both parties appeared comfortable in their roles and positions.

In contrast, quite early on in the research process KR noted the difficulties fire fighters had with their positioning and role in delivering the safety assessments. As the fire safety assessments progressed it became apparent that some crews were very experienced and

comfortable in this role whereas others saw it as being outside their usual range of activities. Here, it is useful to consider a lengthy passage from KR's fieldnotes early on in the research process (i.e. after the fifth interview):

> *Fire fighters have asked me at a number of the interviews how long I would like them to take. Some of them check in with me as they do their assessment: "how are we going? Is this what you want?" I am apparently asking them to do something that they see as being foreign to their job. They seem to think that they are doing it for me – that they need to meet my requirements – rather than that they need to meet the requirements of their job as professionals concerned with communicating fire-safety information. They are uncertain about what is required of them. They clearly feel uncomfortable about looking through people's homes; they have reiterated a couple of times that they are not the "experts" on this matter – they are used to seeing homes as they burn; they deal with the uncomfortability by using humour. They deal with their uncertainty about what to say by discussing décor and general household safety. A number of them have made the point that their own homes lack the very safety features that they are recommending to research participants, and contain the risk factors that they are pointing out in research participants' homes. They seem very keen to take part in this process as empathic human beings ("we are not here to criticise") before they take part as fire service staff ("here is some useful information for you") – although they work hard to juggle both roles. In some ways, they try to make it clear to inhabitants that they (the fire fighters) don't have all the answers, yet it seems that (for the sake of the research) they try to give lots of answers – perhaps even too many answers – extending well beyond fire safety.*
>
> *The fire fighters are trying to balance their confusing and contradictory tasks: (1) to satisfy the needs of the research ("have I said enough yet? Am I doing the right things here?"); (2) to resolve their own sense of discomfort about looking through someone's home (making jokes; discussing heating bills and décor; talking about their own homes, their own heating bills, renovations etc.); (3) to fulfil their role as fire service staff (identifying fire hazards and making recommendations); (4) to reiterate at almost every interview their discomfort about, wariness of, or awkwardness in the "expert" role the research puts them in.* (From fieldnotes, 2/10/00)

Fire fighters acknowledge that their role involves domestic fire prevention. How each fire fighter, and each crew, carries out this aspect of their work appears to vary considerably. Although it was not the purpose of the current research to investigate the role of fire fighters, some fire fighters did talk with the interviewer about ways in which they raise the visibility of the fire service in their local community: the school visits, the pamphlet deliveries, and the process of going into homes to install smoke alarms. While some fire fighters, and some crews, seemed particularly versatile and experienced in walking around a dwelling talking with residents about fire safety, this was not the case with all crews. Some crews indicated that this was a regular part of their work while other crews indicated that the research process required them to do something quite unusual, about which some of them felt uncomfortable.

Because domestic fire safety requires the active and on-going participation of residents (installing smoke alarms, changing batteries, using heat sources with care, planning evacuation routes), it would seem ideal that domestic fire safety-promotion be interactive and engage residents in ways that compel them to take action. Domestic fire safety is not simply about 'transmitting knowledge' and then assuming that people will necessarily put that 'knowledge' into practice. The very challenge of domestic fire safety-promotion is to find ways of compelling residents to put into practice what they already know (installing and maintaining smoke alarms is the best example of this).

Aspects of fire fighters' talk opened up interaction with residents and recommended their on-going, active participation in fire safety practices. Fire fighters asked residents about their use of heat sources; they stepped residents through imaginary scenarios where it was necessary to extinguish, or escape from, a house fire; they gave practical advice on the installation and maintenance of smoke alarms; and they engaged in talk about the problems that can be experienced in relation to smoke alarms.

Other aspects of fire fighters' talk did not promote interaction, but suggested that there is a list of fire safety tips to be recited and remembered. This list varied from one crew to another, but included items such as: knowing where to find the main gas cut-off, having circuit-breakers on electrical multi-boxes, having gas heaters serviced and electric blankets checked regularly, being able to reach the main stove cut-off without reaching across the elements, not overloading power points, not leaving the house when the clothes dryer is going, cleaning the clothes dryer lint filter regularly, not leaving exits blocked, not having cords running across the floor to be tripped over or worn through, not leaving burning objects (such as candles) unattended.

The Safety Assessments

Because we believe that this aspect of the research will be most useful for the NZFS, the bulk of the analysis below is given over to presenting further detail on the safety assessments and how the fire fighters presented these to residents. This section of the report will identify several key aspects of fire fighters' interactions with residents, giving examples from transcripts and raising questions about the diversity in approach that has been observed across different fire crews. Diversity offers strength, particularly when the intended audience is diverse: different approaches will appeal to different sectors of the public; diversity among fire fighter crews could also be thought to help interaction with diverse types of residents. Attention will be paid to the ways in which fire fighters built rapport with research participants, the ways they talked about fire safety, the aspects of the fire safety message they tailored specifically to the given audience, and the components of their advice that went beyond fire safety.

Building Rapport

Fire fighters used various methods to quickly build rapport with the research participants who invited us into their homes. The diversity of approaches to rapport-building is consistent with personal differences that would be found among any group of workers whose job involves interacting with the public.

There were factors that may have impinged on rapport-building, and these were structural: the effect of up to four uniformed men arriving at one's home, in a big fire truck, is potentially imposing. When there were one or two fire fighters doing an assessment, there was more opportunity for all parties to participate in the interaction. When there were three or four fire fighters, one of them often took up a lead role in the interaction, and one or two may have been almost silent throughout the process. Having up to four uniformed men, one researcher with tape recorder, and at least one research participant, walking through a house and trying to squeeze into small rooms necessarily poses a challenge to those attempting to build rapport and create a comfortable interaction.

Nevertheless, fire fighters did successfully build rapport with research participants by talking about their own homes, telling stories about house fires they had seen, and using humour. Some fire fighters had a way of qualifying or softening what they were saying, when offering advice to research participants. This may be seen as part of rapport-building. It may also be interpreted as an indication that some fire fighters are not entirely comfortable in the role of giving advice to people about how to live in their own homes.

Softening the message may make the interaction more comfortable, both for the research participant and for the fire fighter.

In some instances, fire fighters qualified what they were suggesting in ways that softened the message but did not necessarily detract from its value.

> FF: *I mean these are really picky things.* (A6)
>
> FF: *I mean you could say we're being pedantic but these are things that happen.* (A11)
>
> FF: *I don't want to be Mr Doom or Gloom but just giving you some reality of things that could happen.* (A8)

In other cases, fire fighters may have risked detracting from their safety message, by prefacing it with words that suggest uncertainty.

> FF: *Exit drills, good one. Sounds a bit corny but there's nothing wrong with just running it through what you're going to do.* (A8)
>
> FF: *Oh yeah some cigarette butts out on the balcony there, I guess that's just a personal thing, got to make sure that if they smoke over there, the butts in the ashtray.* (A9)

It is not entirely clear whether the fire fighters, in these instances, are qualifying the safety message in order to appeal to the audience, or in order to deal with their own discomfort with taking on the role of 'expert'.

In many cases, fire fighters talked about the presence or absence of fire safety features in their own homes. This could be seen as an important rapport-building strategy which breaks down the barrier between a uniformed "fire expert" and a resident. Alternatively, it could be seen (in some cases) as jeopardising the impact of the fire safety message.

One research participant's house was being renovated at the time of the fire safety assessment and consequently there were building materials partially blocking exits and flammable liquids inside the house. In the course of this interview, one of the fire fighters said:

> FF: *In my own personal situation my place is under renovation and there's turps sitting in the corner and paint and I mean really it's a potential nightmare if anything was to happen but it's the sort of things that we do.* (A1)

In another house, the resident and the fire fighter were discussing the fire safety effect of sleeping with bedroom doors closed.

> R: *So do you reckon that you have the doors open or shut at night?*
> FF: *Shut. As long as the children can tolerate it. My children wouldn't tolerate it, they wouldn't have a bar of that and I'm going, well there's always compromise isn't there.* (A8)

In some cases, it is not clear that the fire fighter's personal disclosure is useful for both building rapport and communicating about fire safety.

> FF: *Look honestly I haven't got a fire extinguisher in my place. I've got a hose that's connected and it's nearby.* (A5)

> FF: *That's just a design feature of this house isn't it. You just can't make people put a door in when they don't want to, you could climb out those windows if you had to. I've got a similar problem in my own house.* (A12)

In many cases, fire fighters skillfully interwove rapport-building (through self-disclosure) with fire safety messages.

FF: *I sleep with my door open because we've got a wee child through the other room, but I've got a smoke detector outside the, right outside the bedroom and one in his room so we've got an early warning system.*
FF: *Another good thing which I've got over at my place is I've got the time switch on my electric blanket so failing to forget to turn the thing off, it actually turns off by itself.* (A1)

One of the ways in which fire fighters built rapport with residents, and made the fire safety assessment more comfortable for everyone, was through the use of humour. Only some fire fighters employed humour in this way, and when it was used it seemed to draw a very good response from research participants.

FF: *It usually occurs in the kitchen when men start cooking things.*
R: *So I should stay away from the kitchen.*
R: *There's no chance of that happening in this house I do assure you.*
FF: *Is that right. That's when men come into the worst part of it they start, you know, everything has to be done at once. Plug it all in.* (A3)

R: *What would you do with the curtain to avoid that problem.*
FF*: Well you could tie it back like that and it actually creates more light too doesn't it. Or if you're over at X where we're stationed is you can put a big knot in it.* (A5)

FF*: You've got a* [pet] *rat, if you see the rat lying on the ground with its legs up that means the smoke has got to it, carbon monoxide has taken over.* (A9)

Telling the Fire Safety Story

Throughout the research, fire fighters shared with residents individually-tailored information about domestic fires. This meant engaging in an interactive process and framing safety messages in such a way that they are likely to be acted upon.

In many cases, fire fighters talked about fire safety in ways that engaged the resident and made clear, specific, and feasible recommendations. Fire fighters often told stories or created imaginary scenarios in order to illustrate the fire safety message, demonstrate their practical knowledge of house fires, and invite the resident to take action in preventing such a scenario in their own home. Aspects of fire fighters' approach to telling the fire safety story will be discussed in this section with particular reference to language and framing, hypothetical scenarios, and visualisation and role play.

Language and Framing

The specific language fire fighters use in talking about fire safety is very important for the translation of their message. The framing of the fire safety message may lead a resident to act on that message or not. Here, we outline a number of fire fighters' approaches and indicate which approaches may be more or less useful in talking about fire safety.

Sometimes, fire fighters communicated with residents using language that appears to have come, unmodified, from some form of 'expert' source, whether oral or written. The use of words such as "implement" and "egress" may not be ideal when more common words are available.

> FF: *Juvenile intervention do you think that could be an option?*
> R: *Yeah I do. I do.*
> FF: *Do you want me to implement?*
> R: *Whichever, whichever's easiest for you?*
> FF: *Well make it easier for you really. To make sure that it does happen would be the way to go wouldn't it.* (A8)

Describing a Malaysian-Chinese New Zealand family as "Asians" may not be the most sensitive way to ask about their cooking methods.

> FF: *Being Asians do you use a wok and those sort of things?*
> R: *No*
> FF: *Does your Mum or anyone else?*

FF: *I was just thinking if there is, there's no fire extinguisher or even small, the small dry powder or something like that. Yeah it would be a suggestion.*
FF: *Okay so if we're doing stove top cooking that involves oil and stuff it's good to have that around.* (A12)

Even fire safety messages that have been carefully tailored to appeal to the ear can be more or less informative depending upon how they are framed.

FF: *Okay. The heater metre rule. And it's that, I know it says eight inches, but that's actually quite close to the heater and also having this on the top of the heater coming up, it might singe that.* (A12)

Two frequently recurring fire safety messages related to the "metre heater rule" and "general housekeeping". The latter of these messages may need some modification before being presented to residents. What "housekeeping" means in one household may not be the same as what it means in another household. There were times when fire fighters appeared (understandably) uncomfortable about delivering this particular message.

FF: *There's just general housekeeping. … That's one of the main things, general – and when I say housekeeping I don't mean dust the ledges, it's things like power points, leads, if you're using and extension lead don't put a rug over it and walk over it.* (A3)

FF: *So just a bit of housekeeping possibly down there, to get things organised.* (A6)

Here, one fire fighter is careful to explain that by 'housekeeping' he does not mean how tidy the house is, whereas the other fire fighter neglects to add this extra element of explanation. Either way, to talk of 'housekeeping' as a factor in fire safety seems to raise more problems than it solves.

In walking through research participants' homes, pointing out fire safety issues, fire fighters appeared to some extent to be working through a mental list of things to mention. This effect was possibly exaggerated by the research process that required fire fighters to talk with research participants while being audio-taped. For the sake of transcribing, all were asked to avoid talking while walking, and to be in the vicinity of the tape recorder while talking. As a result, what came out sometimes sounded more like a list being recited than a series of informative, engaging comments on fire safety.

FF: *Right, shall we start in the kitchen, let's see the kitchen, Paul*

FF: *... [you have] rubbish on top of the LPG cylinder which is not good. So if you had to in a rush, you know turn it off, which is the best ideal with gas you've got rubbish there and you've got food stuck on top of that. That's not the best. So we've got a house with toaster underneath and have the cord underneath …*

FF: *Yeah, other than that not really a great deal. That entrance way you've got some building materials in front I think.* (A1)

Obviously, lists can be useful, and in fact are commonly used with other safety practices (e.g. getting your car ready to go on holiday), but there is a sense in many of the safety assessments that when the interaction is too rigidly organised in a list-like fashion, the residents may lose interest and engagement with the fire fighters. The other side of this is to suggest that if fire fighters are indeed working off some kind of list, from memory, why not formalise such a list and make it available to residents, and indeed to other fire fighters? Such a list, if used flexibly, could be useful both as a formal record, and to free up fire fighters to more directly engage in interaction with residents.

An additional feature of the 'listing' tendency was that as each point was listed, evaluative comments were often made, indicating the degree of fire risk that may be present. Sometimes, evaluative comments were framed in terms of "we don't like that" or "I'm not happy about that", or by explicitly ranking a household relative to others.

FF: *Another thing which I'm probably not too happy about is your cut off switch for your range.* (A5)

FF: *Okay. Your bedroom at the front, I notice you've got the cord along – now the reason we don't like that sort of thing because if you rub it, it can wear through.* (A7)

FF: *Right, this room here, I believe it's a bit of a worry actually this room here. … It's only got this door to get out and that other door over there is all blocked up with bits and pieces. … you've got a little sliding door … with no smoke alarm in there, with extra electrical appliances beneath the bed, it's a bit of a recipe really.* (A9)

While talking in terms of 'we' or 'I' is an everyday means of engaging with others, it is also the case that in professional discourse there is a tendency to use general reference terms that do not feature personal pronouns. This can sometimes shade over into the production of jargonistic language that can be criticised for being too 'impersonal' (e.g. medical doctors have been criticised for their use of jargon). However, from the examples above, and from the fire fighters' assessments in general, it can be suggested that expressing advice in terms of what 'research has shown' or what 'the Fire Service recommends' may be more effective.

One of the ways that fire fighters engaged residents in thinking about fire safety was through creating vivid visual images with words. Fire was depicted as roaring and racing, a stairwell was described as a chimney, gases were personified as "looking for a source of ignition", and an old wooden house was likened to a fire cracker.

FF: *So your only exit is down this end of the house, should anything happen in your hallway, an it's roaring out through there because you haven't closed the doors, there's no way you're going to get access … If [the door] is closed. If it's open [the fire] will race right through.* (A1)

FF: *For instance, your laundry area, if you had a fire down there and you were I don't know whatever, upstairs here, that would act as a chimney. You know your smoke fills this up and would come straight up here.* (A4)

FF: *be very careful because you've got a build up of explosive gases in the house, looking for a source of ignition to go bang.* (A8)

FF: *looking throughout your house, it's not gib boarded throughout the house and it's all scrim or pinex … So the thing is if anything does catch fire in this house it will go like match stick, go like a fire cracker.* (A9)

One of the potentially more risky strategies used was to paint a picture of something that the fire fighter was warning the resident *not* to do.

FF: *But don't wrap yourself in a duvet and throw yourself out the window, it's a long way to the bottom.* (A11)

Perhaps the most audience-appropriate use of a visual image occurred when one fire fighter talked to a pre-schooler about exiting a smoke-filled house.

FF: *And do you know where the safest place in your house on fire is, the best place for you is down on the floor here like this because this is a good area, down here, right.*
FF: *You don't stand up do you. Get down on the hands and knees crawling, right.*
FF: *Like a snake, yeah.* (A5)

Hypothetical Scenarios

Often, the fire safety story was told to residents through the construction of hypothetical scenarios. Fire fighters described numerous scenarios to encourage residents to envisage how they might prevent a fire and how they might get out of their house in the event of fire. At one end of the spectrum, fire fighters were able to refer to scenarios that actually had occurred, and base fire safety advice on these scenarios.

FF: *I've been to many fires started by clothes dryers, people turn them on, leave the house, go down to the shops. Go to work. It all heats up and up it goes.* (A5)

FF: *I think we'll kick off with the smoke alarms. I've seem them and they work so effective – they really do work. People have been standing outside and their place is burning like anything and it's actually saved their lives. I've done a few calls [where] … a family in there were in bed at 10 o'clock at night, about half past eleven*

the smoke alarms went off, they were outside, the fire service turns up five minutes later and their place was pretty well gutted and there's no doubt in my mind that they would have been in serious trouble if they hadn't been woken up by the smoke alarms. (A8)

Most commonly, hypothetical scenarios were built around features of the dwelling being assessed at the time, without reference to actual fires in the past. These hypothetical scenarios helped residents to see their own living space in terms of fire safety.

FF: *That entrance way you've got some building materials in front I think.*
FF: *In the event of an emergency if you had to get out that door it might obstruct you.*
R: *It would certainly as it is now, it would be just that little longer to squeeze through.*
FF: *Yeah and certainly if it was dark or at night that might get in your way.* (A1)

FF: *That's usually the one, somebody will grab the pot of fat and go move outside and as soon as they start moving, the flame comes back and it's too hot for them and bang they drop it and the situation's compounding. If you can leave, turn off the power and just let it cool down.* (A8)

FF: *Is that a paper lampshade that's put on, I don't think it's really meant to fit there so wherever it touches light bulbs, it would get very hot and would ignite that paper.* (A9)

FF: *Well it's repetitious in [this] room. We've got wires on the floor. Again we've got a small heater with the vent blocked off. The TV's on. Tripping hazards again and I guess the first thing for me is the gas heater. It looks to me like that gas heater would probably be dangerous in there.*
FF: *Plus also things like this on a wall, I know they look nice and decorative but this really adds to fire spread. Because I mean if that wasn't there it would take it a long time to spread up a wall, but I mean you've got them all over the place. They can spread very quickly.* (A11)

At the other end of the spectrum, were hypothetical scenarios that indicated an even more hypothetical, or relatively minor degree of fire risk.

FF: *Okay the fuel outside, I mean anybody could come and do anything. I mean they could, some kid or yeah set fire to it. It probably should be locked away downstairs.* (A1)

FF: *In the lounge this has got a wetback on the fire system, particularly for young kiddies getting round behind there, those pipes do get extremely hot when the fire's going so it's pretty well lagged, but it can be a hazard of course with papers and everything else too close to the fire you know, particularly plastics.* (A10)

In each of these cases there is evidence of a great degree of uncertainty. It should also be noted that residents also ventured similar hypothetical scenarios, and taken together this suggests that they are a useful interactive strategy for talking about fire safety. But, of course, there is also the issue of how hypothetical scenarios are translated into action. Given the importance of this issue we devote further discussion to this in the section below on 'repetition and extendability'.

Visualisation and Role Play

While some hypothetical scenarios engaged residents, and others pointed broadly to fire risk, the use of visualisation and role play offered a more audience-specific and interactive approach to telling the fire safety story. Not all fire fighters used visualisation and role play and each of those who did offered unique and potentially very useful ideas. By engaging residents in thinking about fire safety, fire fighters were able to step them through a potentially life-saving process. Here, some lengthier extracts illustrate the successful engagements with residents.

FF: *And how long have you been in the house?*
R: *Two years.*
FF: *Oh well in that case, if you woke up in the middle of the night and you couldn't see a thing in front of your eyes, do you think you would be able to get out?*
R: *If I was in the bedroom, couldn't see.*
R: *Yeah we'd know where the window is.*
R: *I'd know where the window is. It would be a tough thing just to open quickly.*
FF: *… It's quite amazing, you know one afternoon when you're not doing anything … Just go into the bedroom and then close your eyes, turn round and just see whether you can walk say give yourself a point, front door or back door and just walk*

very carefully to there. But just see how hard it is even in your own home because we're not used to walking round where you can't see. You do become disorientated very quickly. And if you're doing it

R: *You're supposed to crawl*

FF: *Oh yes. Hands and knees. Put your lips sucking on the floor and that's where the air is right down there.*

FF: *But you see in that situation then you add panic. No you do. If you wake up in the middle of the night and you smell smoke or you can see smoke immediately the panic takes over the normal calm sedate, I know where the front door is, the back door and you get outside and you want to go back in and get your handbag.* (A3)

FF: *Well that brings me to the point where this [fire extinguisher] in here … How long do you reckon the fire extinguisher will last for?*

R: *Probably 30 seconds.*

R: *No idea.*

…

FF: *Ten seconds, seven seconds, five seconds.*

FF: *Yeah five seconds. The big ones, the big CO_2 that you see all round buildings, ten seconds. This here, say you've got a little fire which is most fires I've been to, pots of fat. I won't put a tray on top of a pot, or a lid on top of it, I use the fire extinguisher. So you get the fire extinguisher, you'll be a bit panicky, you've pulled the safety back you go over and how would you use it?*

R: *I was thinking before I'd have to read the instructions before I could use it.*

FF: *So the underlying thing we've got flames coming out, if it happened under your extractor, expelaire, and it's you know*

FF: *Right pull it out and that's the pot that's going. Now this is the way, you've got to bear in mind that this comes out, it doesn't come out in nice covering cloud it comes out in a jet. So if something goes up high like that it will fly back in your face. Because just as quickly as it goes in, it can come out and go whoof, flare up.* (A5)

FF: *One thing from my point of view, when your flatmates are here one night, is do an evacuation drill and what you do is you blindfold your flatmates and tell them to find their way out crawling on the floor. If there's a fire the smoke always comes round and the clearest air's down there, so if you're going to get out of the building when it's on fire, go on your hands and knees, blindfold, see if you find the door, that's a good thing.*

FF: *And most of the time even when there is, like if an area is heavily smoke logged, there'll be an area about that high that is clear. Until it's disturbed so we can go into a house that's burning and you can actually get down with your face mask right on the ground, if you're lucky you can do a scan and you can actually pick up if there's a body there. So if you're in a situation like that, you get right down low you'll be able to see. Just about that much though, and you'll be able to see until you start moving and then you start scuffing it all up. And you don't know where you are.* (A11)

By encouraging residents to visualise a house fire and imagine what they would do, fire fighters were able to offer specific information, challenge dangerous assumptions, and suggest useful courses of action. These three extracts clearly show how effective fire safety interactions are brought about by visualisation of concrete scenarios. There does not even have to be much talk from residents (see A11 extract) - it is plain that in the relatively prolonged development of a fire fighter's story an effective fire safety message is being translated.

Tailoring fire safety messages to the audience

Throughout the research, fire fighters frequently tailored fire safety messages to the audience concerned. Residents' age, physical ability, financial situation, living circumstances, and level of fire safety awareness were carefully taken into account in the course of the interactions, and every effort was made to respond usefully and appropriately in each instance. Where the household included children, attention was paid to child-proofing heat sources; where a number of people were cohabiting, attention was paid to evacuation plans; where the residents had difficulty installing their smoke alarm, the fire crew installed it for them; where there appeared to be physical and financial constraints, fire fighters offered to install free batteries in smoke alarms; where fires had already occurred and young children were present, a juvenile intervention programme was put in place. When fire fighters tailored their response to the audience in these ways, it was very well received.

FF: *You should change the battery annually, and I think that we're going to have a promotion soon. The fire service one to change your battery at the beginning of daylight saving.*

…

FF: *We're quite prepared to come and do it.*

FF: *We give you a free battery too.*

R: *Oh alright, I'm into that.* (A2)

FF: *what we can do, if you've got the time we can – it will only take ten minutes – but we can grab the ladder and reposition that smoke alarm for you if you wish, would you like us to do that?*

R: *Yeah, might as well.* (A9)

In some cases, fire fighters' message was audience-specific in that it responded to specific questions posed by residents.

R: *It's actually worth, I mean you'll probably say it is, but it's actually worth buying a big sort of commercial scale one?*

FF: *Look honestly I haven't got a fire extinguisher in my place. I've got a hose that's connected and it's nearby, but not a fire extinguisher. To get to a fire at the real early time, yeah they're okay. But once they get a bit big you don't even know about it, they won't even make a dent in it. The most effective thing is just covering it up, covering the fire and get out. Close the doors and get out.* (A5)

In a number of instances, fire fighters clearly tailored what they were saying to allow for residents' financial circumstances.

FF: *I'd get an electrician to put in a power point, that is the best option.*

FF: *That's extra cost.*

FF: *Yeah but it's expensive, but I mean if you're, if you can pin the cord up around the wall or something would be a safe option if it's not on the floor, but it doesn't look very nice.* (A7)

FF: *Smoke alarms, the fire service recommend that there should be a smoke alarm in every bedroom. The way the economic climate is, well not many people can afford that. So usually what we're aiming at is separating the living areas from the sleeping areas. So if you're going to put one in, you probably put it in the centre of the hallway or something, so the lounge, you're off to bed, the smoke starts travelling there from the kitchen to the lounge, you're woken up.* (A8)

R: *Yeah well we're thinking about buying a fire extinguisher, just with my record at the moment.*
FF: *Right. Certainly if not have a good bowl of flour around and you know the pot one, got a lid handy by the stove.* (A8)

In other cases, the message was obviously tailored for specific living circumstances.

FF: *Since you live with other flatmates, I see you haven't got a smoke alarm in your bedroom. That's one of the first things I'd do. I'd protect your own safety and I'd get a smoke alarm in your bedroom.* (A9)

FF: *For the sake of $10-$15 it could be worthwhile and to actually test them, to know how to test them and every now and then and change the batteries once a year when you change your clock, you change your batteries. When you do your vacuuming, whoever does that, give it a vacuum and also you know it does sound pedantic but really in commercial premises you are required to practice evacuation drills. You know the alarm goes, everybody's got to evacuate the building and go to a set place.* (A9)

Repetition and Extendability

In the course of their fire safety assessments, some fire fighters tailored their comments to the audience but did not necessarily confine their advice to fire safety issues. Across a number of interviews, fire fighters gave residents tips on interior decorating and saving power, made suggestions about general child safety, and talked about the risk of electrocution. Some of these comments could be construed as general conversation and rapport-building, while others indicate an understanding that fire fighters' role extends beyond fire prevention to general health and safety concerns.

FF: *Well nice place, nice situation. Absolutely beautiful.* (A8)

FF: *Bathroom very nice, nothing much to be said in here really, it's all very nice, it looks very new.*
FF: *Nice mirror.* (A3)

FF: *And good storage of your solvents and cleaning products there.*
R: *That's good.*
FF: *Yeah and tucked out of the way of children or whatever. The dog, wouldn't want to do any harm to your dog but I mean we've been in places where you know they're under the sink.* (A3)

FF: *I would not have that mirror there, if that door gets closed and the kids are [nearby] they'll get shredded.* (A5)

FF: *I notice the three pin sockets, it's probably not fire safety, like I said before – with some of the three pin sockets you've got those plastic plugs, they're excellent. All my three pin sockets have those. My girl loves pulling the plug out, I watched her and she'll stand there and she's got her fingers in and she'll try to put it back in, straight in you know. I got those little plastic ones.* (A5)

FF: *Talking about the electrical switchbox here. Actually it's behind the board that's the worry. Because it's immediately above the doorway, usually there's a covered up of a board, you know a cover over there. People can get their hands up through there and if you're anything like me, you can go up, touch all sorts of things, you don't know what's live.* (A9)

Fire fighters acknowledged that the list of fire safety tips became repetitive and some fire fighters saw it as an idealistic list.[5] In some cases, they acknowledged that features of the dwelling made it impossible to act on certain fire safety tips, for example: not all rooms

[5] After one of the interviews, a fire fighter commented to me that the suggestions they were making were really "pie-in-the-sky". There was no way this fire fighter thought the resident would follow up their suggestions.

have two viable exits; some kitchens are designed so that the only place the stove fits is in front of its cut-off switch; old houses usually do not have enough power points in each room to accommodate modern appliances and avoid overloading. Furthermore, variations across different fire fighters' versions of the domestic fire safety list suggest that none of the fire safety tips is actually a certainty; e.g. the recommendation that bedroom doors be closed at night. Most fire fighters recommended that doors be closed at night and accompanied this recommendation with the explanation that domestic fires most often cause injury or death when residents are asleep, and that a closed door significantly slows the movement of fire through a dwelling. Despite the simplicity of this fire safety tip ("close the doors before you go to bed"), and despite the plausible and statistically verifiable explanation that goes with the tip, closer investigation reveals variations in the story:

> FF: *Do you sleep with the doors open at night?*
>
> R: *Yeah open. Is that wrong?*
>
> FF: *That's definitely wrong. They should be closed.* (A3)

> FF: *I don't know if the children like sleeping with doors shut but that's one recommendation at night.* (A8)

> I: *Do you have a recommendation about closing – leaving doors opened or closed when you're sleeping, like is there a better way?*
>
> FF: *It always used to be sleep with them closed. But that's changed. I'm not sure if the fire service has an official policy at the moment. Personally I think if you've only got one or two smoke alarms I'd sleep with your doors open. But if you have a fire starting in your room, you're sleeping down quite low the chances are the smoke will set off the alarm before it suffocates you. If you've got them in your room, then if you've got them both sides of the door then you can sleep how you choose. But if you only have them outside your bedroom, sleep with your doors open.* (A13)

Variations arise in the story, as different fire fighters have different understandings, and as they each respond to a specific household's circumstances (the presence or absence of children, the level of financial flexibility, the layout of sleeping and living quarters).

Educational processes necessarily have an element of repetition of key 'facts', nevertheless, the variability and uncertainty inherent in fire safety lends fire safety-promotion to interactive learning. Each resident has particular knowledge of their dwelling and of their habits, and this knowledge can be drawn out and employed productively through an educational process. The implication is that even the hardest 'facts' are flexibly employed in the interactions between fire fighters and residents. This is not a fault, simply a point that makers of expert knowledge need to bear in mind.

Extendability

Sometimes the areas broached in 'going beyond fire safety' seem very hypothetical and attenuated. However, as our theoretical framework and the above point about 'facts' would suggest, these attenuations cannot easily be regarded as frivolous or unnecessary. This is simply because it is true that hazards and risk factors can be found anywhere, if one looks hard enough. Thus, fire fighters face what we call a 'problem of extendability'. As displayed above, there are key points that fire fighters hammer home, and these have become almost mnemonic, with the 'metre-heater' rule and 'install smoke alarms' being the best examples. But if being a fire fighter simply amounted to repeating such mnemonics it would not be a professional occupation informed by expert knowledge. It is clear that knowledge on fire safety is rapidly accumulating (as this project and other NZFS contestable research grants exemplify), therefore, as more and more external knowledge builds up about potential 'risk factors' there are more and more things that can be commented upon in a fire safety assessment of particular households. Because the people that live in these households use practical situated knowledge, fire fighters' assessments can easily be 'extended' too far, and simply look contrived. However, at other times householders clearly appreciate the fine detail and appear to gain both additional knowledge, and confidence about putting new and old knowledge into use. One of the best examples of this concerns how to use a fire extinguisher, which most people probably do not give a second thought:

FF: *Great, is there anything else?*

R: *Fire extinguisher. How do you actually use it?*

FF: *I suddenly thought of that when you mentioned it. Yes, it will be dry powder, the whole thing. You take it off the wall, just pull that pin out and aim it, when you come in, you aim at the fire but a fair distance away, just pull the trigger and aim it at the base of the fire. Don't go for the flames, if it's leaping up here, on a pot of fat and the flames are all up here, don't hit that first, hit the base of the fire first. And it's just, all it is, it's sodium bicarbonate. Like talcum powder, makes a hell of a mess. You just look like a snowman until you take a shower.*

R: *Okay then.*

FF: *Alright yeah, and every once in a while just make sure the little yellow arrow is in the green, because if it isn't it means that it's either got a small leak in it or someone's tampered with it.*

R: *Is it okay at the moment?*

FF: *Yeah, yeah that's green. That's on the high side of the green so that's okay. This is on the low side.*

R: *So when you say stand at a distance I mean what sort of distance?*

FF: *Well if you got too close to it you actually fan the fire, it actually blows the fire all round the place. About that much of it, it's going to come out not as a solid jet, it's going to come out with quite a bit of force and just flutters all round the place. So you want the cloud of dust to smother the fire, not the jet. You're not forcing the fire, you're smothering it, that's like a dusting of talcum powder. Imagine what would happen if you actually aimed it into a pot of fat, it would go all up the wall, so yeah. The other thing that people don't often realise is that fire extinguishers are actually quite noisy when they go off. But these ones here are reasonably quiet. The old CO_2s are really noisy and you get a hell of a fright, but these things here are quite gentle.*

R: *Okay* (A11)

Perhaps the area where the most space was created for interaction between fire fighters and residents was in discussion concerning smoke alarms. The action, on the part of fire fighters, that was most often taken in the course of the research was to test, install or re-position smoke alarms. Research participants often asked questions about smoke alarms (Does it work? How do I install it? Where should we install it?). They also raised concerns about false alarms and other annoying sounds that came from the smoke alarm. Fire fighters frequently responded to research participants' talk about their smoke alarms by sharing stories and suggesting solutions in ways that signalled empathy and concern.

Interestingly, the NZFS approach to smoke alarms in domestic dwellings minimises the need for an interactive approach from fire fighters, potentially enabling them to give a minimal response of "don't worry about it, we'll fit it for you and change the batteries yearly". This approach works in direct contrast to understandings about the importance of employing safety-promotion techniques that maximise resident engagement. Some fire fighters did point out that it was because of residents' requests for help with smoke alarm installation that they (fire fighters) were called to enter homes where they could then offer further suggestions regarding fire safety. So, on the one hand, the NZFS approach of fitting smoke alarms for residents appears to minimise resident participation in their own fire safety but, on the other hand, the process of fitting a smoke alarm enables fire fighters to enter people's homes and introduce a more interactive aspect of fire safety promotion, thereby engaging the resident in the process and encouraging them to take further action.

A clear point to be taken here is that there are no hard and fast rules about how best to promote fire safety. Fire fighters simply cannot be forewarned about what will work, when and for whom. Practically, though, the NZFS wants to know how to improve its services, hence, working out when a particular strategy works well becomes the key issue. Our answer may appear somewhat evasive: it is experience that tells this. That is, it is primarily by giving fire fighters greater experience in actually interacting with residents in their household that will improve their skills in treading the fine line between attenuated pinpointing of hazards and risks, and useful detail about fire safety procedures and how to put them into practice.

There is one final example that exemplifies the above argument. This comes from a household of a married couple and three young children, where the mother is obviously concerned about her fire-preparedness:

I: *What about fire prevention? Have you thought about that side of it? You were just saying that you've talked with your children about an escape plan, and I was saying what have you thought about in terms of prevention, fire prevention, is there anything in this house that you've put in place?*

R: *No. I'm pretty poor in this house I must admit. Every time I hear a fire start with the fire alarm I think, "oh God change the radio station", because what will happen?*

I: *So your main prevention things would be just being careful then?*

R: *Yeah. Well we set the house on fire three times last week - I've got "pregnancy brain!" - the whole house was full of smoke last week and it took me about three or four days to get rid of the smoke.*

I: *And is there anyone else, just you and the children, you and three children?*

R: *Three children and my husband.*

I: *Okay, and does he think or talk about fire prevention at all?*

R: *No we don't. I probably do all that sort of stuff with the kids.* (H8)

Clearly, this is a situation where a mother is very busy looking after three children, there have been a number of small fires, and consequently she is very interested in learning more about fire safety, but yet still seems to have to do this by herself. When the fire fighters did the assessment of this household the interactions with the resident very quickly came to centre around how to incorporate the children into fire safety. A fire fighter offered to enrol the children in a programme on juvenile fire prevention. This was well received and shortly thereafter the fire fighter was able to pass over some instructional material:

FF: *What I've done here also is I've brought a whole lot of material – colouring for the children, which can help them to focus a bit. Not knowing fully what was going on I emptied out the promotions cupboard of one of everything we had.*

R: *Is there one of each?*

FF: *Here's escape drills in the home there which is a sort of worksheet, it will only take ten minutes to go through it. Houses,* 'Safe As Houses'. *Apartments, you won't need that. That would be another one that would be of benefit to you. If I remember rightly there's a little crossword puzzle or a little, inside the actual – one on fireworks drills,* 'We Know What's Going Up'*.*

R: *Mm, my husband's a maniac.*

FF: *One for you and your husband to go through just to check how safe your house is, sort of like a self assessment. I'll leave all the rest of it here anyway.*

R: *Okay that will be great.* (A8)

In this extract we can see that the resident was very pleased to be offered the material, and in the remainder of the fire fighters' assessment it is clear that the resident was approaching the assessment very positively and was serious about acting upon the information offered. It was also clear that the fire fighter was happy to have useful material to offer: there is a clear sense of satisfaction at a 'job well done'.

But there is a more general point that needs to be noted here. It is this: there did not appear to be any system in place for standardising the distribution of such undoubtedly useful fire safety material. In the words of the firefighter, "not knowing fully what was going on I emptied out the promotions cupboard of one of everything we had". In this case the opportunistic action worked, but to make use of the terms in our theoretical framing, here 'system' and the various located 'boxes' are out of synchronisation. The broader system has material tailored for particular individual circumstances, but in terms of the crucial linkage between these, that is, the firefighters, there is no sub-system for standardising the distribution of this material. If such a sub-system was designed, it still needs to bear in mind that the success of instructional material is dependent upon 'enactment', that is, it must build in flexibility, because outside of the to-and-fro of fire fighters and residents' interactions, instructional material is lifeless. Materials need individuals and households for their sense; individuals and households need something

stable and standardised for them to have a sense that they really are putting a fire-safety programme in place, and that in the event of a fire, their actions will be changed for the better.

4. Conclusion

The qualitative approach taken in this research has generated a great deal of data, only some of which is presented and discussed above. By reproducing many extracts from the interviews and safety assessments, we hope to have shown both the variety and fine detail of fire safety interactions. As outlined in our theoretical framework, we do not wish to reduce the complexity of the social world to the operation of one, or even a few, factors. Nevertheless, the discussion above has pinpointed key patterns that have emerged from our consideration of the data. Moreover, our discussion has centred around a key observation: for fire fighters, entering people's households and offering a fire safety assessment is a difficult exercise. This is not because of any deficiency in their fire safety knowledge. Rather, it is because, in the situations we have described, such knowledge becomes practice, and hence is subject to the complex contingencies of human interaction. Often, fire fighters are not comfortable taking on the role of 'expert' where this means they are offering what seems like direct criticism of residents, who are there in front of them to field and react to the criticism. We have discussed in detail the various ways in which this discomfort displays itself.

However, we would also like to emphasise that despite this discomfort there is good evidence to suggest that talking with residents in their own homes is a very useful part of the NZFS' overall strategic plan to reduce fires and improve fire safety. Whereas the process used in this research is 'artificial' in that the assessments were set up and facilitated by a researcher, the fire safety assessments described in this report are a useful model for the NZFS to consider. Below, we offer some more specific implications that can be taken from this research:

- There is considerable variance amongst fire stations' crews in the practice of talking with residents in their own homes about fire safety. Some fire fighters were familiar with what they were asked to do in this research, whereas others were not. If the general tenor of our arguments is accepted, then the NZFS could look at systematising its procedures regarding the approach of fire fighters talking with residents about fire safety in households. This should not be done to the extent that it removes the flexibility and

useful diversity that exists across geographic locations, but should aim to ensure that all crews are well prepared to talk with residents about domestic fire safety.

- The success of talking with residents about fire safety is closely related to the interactional situations produced through that practice. For example, one clear observation is that a team of three or four uniformed men going through a house does not provide the best interactional dynamics for translating safety messages to residents. One or two trained fire fighters for a household assessment seems adequate. We suggest that the NZFS consider developing a semi-specialised role within its current staffing profiles where training for such a role could be instituted. As we have been emphasising throughout our discussion, the skills needed to translate fire safety to residents are largely learnt through practice and experience, but this does not mean that a training programme could not be developed for a useful purpose. What it does mean, when added to our observation that fire fighters' ability to speak personally of their experiences with fires is very useful, is that if a more specialised domestic fire safety role is developed, people placed in this role should not be removed from the usual fire fighting duties.
- Following from the above point, we believe that the NZFS needs to build upon its current willingness to offer installation of smoke alarms. It is clear that residents appreciate such offers, and do indeed take them up, but as our data also show, fire fighters themselves know that just having a smoke alarm in a house is a very small part of being fire prepared. It is recommended that a process of talking with residents about fire safety in their own home be systematically integrated with the current readiness to install smoke alarms. As noted above, this may require a more developed role within the staffing profile of the NZFS.
- More specifically on the procedures of talking with residents in households about fire safety, it is clear that some strategies work better than others. Not all of the useful strategies identified in this research directly concern the translation of 'expert' knowledge. For example, humour provides a good footing for interactions between fire fighters and residents, but this is not something that can easily be taught. Drawing more tightly on fire fighters' specialised knowledge are visualisation and experience-

rich stories. Graphic picturing of fires, or risky situations, combined with telling stories of fire fighters' experiences with fires, are very effective strategies for connecting with residents, who then indicate their willingness to make changes in their household. These strategies cannot simply be turned into a standard formula to be shifted from house to house, nevertheless, it is important to emphasise that they do work and to encourage fire fighters to keep using them.

- Strategies that are more questionable in their success include, the use of jargon, references to 'housekeeping', and 'listing' fire safety factors. There is not much jargon in evidence in the interactions described in the analysis, consequently, when it does occur it tends to look 'out of place'. More careful attention to the use of jargon in talking with residents may enable fire fighters to better identify situations where jargon is appropriately used. Specifically, talking in terms of 'general housekeeping' as a risk/safety factor needs careful consideration. The term overlaps too closely with suggestions of untidiness, and risks sounding like a judgement. Finding another way to identify the fire safety concerns currently expressed in terms of 'housekeeping' is a small but useful measure to help promote domestic fire safety. In a more ambivalent position is the use of a 'listing' type approach to safety assessments. Using a checklist may work well for firefighters, but this could be at the cost of losing the residents' attention and engagement. If the NZFS does wish fire fighters to talk with residents about fire safety in households, some attention could be given to developing a 'hard copy' version of the fire fighters' checklist, and ensuring that such a list is employed interactively, not just as a 'handout'.

Individuals, materials/physical spaces, organisations and their systems are the elements that make up fire safety. Most importantly, fire safety is a result of how exactly these elements are connected; how each 'translates' the actions of other elements. Any attempt to reduce fires through making residents better fire prepared, faces the difficult task of tracing the connections amongst these elements, and working out where practical measures are best directed. This research has been relatively small in scale, but has produced a detailed picture of the complexity of fire safety; further research is

recommended to build upon and further investigate the observations made here. For example, an important corollary of our above focus on interaction is detailed study of those who reluctantly, or will not, interact with those promoting fire safety knowledge. Such people tend to be labelled ‘vulnerable’ or ‘at-risk’; it is important to know more about the variation in their supposed vulnerability and just what constitutes their reluctance to translate and act upon fire safety knowledge.

It is important to emphasise that there is no complete answer to the question of how to improve fire safety. Individuals are important, but there is little use in focusing solely on the skills or competency of individuals. The translation of fire safety knowledge, to improve household fire-preparedness, depends on complex relationships. This research has focused on the interaction between fire fighters and residents, attempting to preserve the complexity of this interaction as fully as possible. The diversity of the empirical material described above points to the importance of maintaining flexibility: what will work in one situation will not necessarily work in another. Nevertheless, we have suggested some practical strategies that may be applied to improve fire safety across a variety of situations.

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Appendix 1:

Information Sheet

The New Zealand Fire Service works to increase public awareness of fire safety in an attempt to prevent, and minimise the damage caused by domestic fires. A research team, comprising Dr Michael Lloyd (coordinator), Dr Katrina Roen (researcher), and Dr Kevin Dew (consultant), has undertaken to do research, in collaboration with the Fire Service, focusing on fire safety awareness in Wellington. The research team is based at The Sociology and Social Policy Department of Victoria University. You are invited to participate in this research.

The Fire Safety Awareness Research Project aims to find out about residents' awareness of the safety features and risk factors present in their own homes. Confidential interviews will be carried out with research participants in their own homes, and with representatives from the Fire Service.

If you volunteer to participate in this research, you will be asked to take part in an interview with the researcher, Katrina Roen, about the safety features and risk factors, that you are aware of, in your home. After this interview, a fire safety expert will be invited into your home to talk with you and the researcher about the safety features and risk factors they see there. Your interview and the talk with the fire safety expert will be recorded on audio-tape and will later be transcribed.

Your participation in this research will be confidential: you will not be identified in the transcripts or in any report or publication that result from the research. The researcher, the transcriber, and the fire safety expert invited into your home will be bound by a confidentiality agreement to ensure that you will remain anonymous in the context of the research. Only the transcriber and the research team will have access to the audio-tapes and the transcripts.

You will be offered feedback on the research when it is completed, and you are welcome to ask for further information, before or after your interview, by contacting the researcher. Should you feel the need to withdraw from the project at any time, you may do so without question.

It is envisaged that the interviews for this research will take place between September and November, 2000.

Before the Interview …

The interview is an opportunity for you to talk about the safety features and risk factors that you are aware of in your home. There is no need to seek extra information about fire safety in preparation for the interview. What you already know is useful. However, it would help if you prepare a little by thinking about these questions:

- What fire-safety features can you think of that are present in your home?

- Are there any aspects of the building you live in that may be risk factors?

- Is there anything that people who live in your home **do** that may increase or decrease the fire- risk?

- Is there anything else about the building, and the people who live there, that you see as either a risk factor or a safety feature?

The fire safety officer who comes into your home to talk with you and the researcher will be available to answer any questions you have at the time. To help them give an accurate assessment of the risk factors and safety features in your home, it is important that they see your home **as it usually is**. Please do not make extra efforts to tidy things away or move them from their usual place in preparation for the visit from the researcher and the fire safety officer.

- *Participation in this research is entirely voluntary.*

- *No participants' names will appear in the final report, nor will any information be used that could identify you.*

- *For more information please contact the researcher, Katrina Roen, by calling 4635233 ext. 8876, or by writing to the Sociology and Social Policy Department, Victoria University.*

- *Ethical approval for this research will be attained through the Victoria University Human Ethics Committee before any interviews take place.*

Appendix 2:

Interview Schedule

The semi-structured interviews are intended to provide a forum where participants can talk freely about their own perceptions and knowledge relating to fire safety in their own homes. The questions below are presented as a guideline only.

Sometimes people install fire-safety features into their homes, and some homes have built-in fire-safety features. Can you tell me about the fire-safety features in your home? (e.g. do you have a smoke detector?)

Different buildings present different kinds of risks, in terms of how easily fire may spread in the building and how accessible fire exits are. What do you see as risk factors in this building? (e.g. are fire exit-routes accessible from every room?)

In some households, there are fire-risk factors associated with electrical wiring or appliances, particularly heating and cooking appliances. What risk factors can you think of inside your home? (e.g. Do you use electric blankets that have not been tested recently?)

Sometimes people's actions increase or decrease the risk of domestic fire. Can you think of anything that the people living here *do* that may present a risk factor or a safety feature? (e.g. maybe boiling pots and jugs are sometimes left unattended and forgotten about; maybe you have planned and practised a strategy for evacuation in the case of fire.)

We have talked about risk factors to do with the building and appliances, and to do with people's actions. Now, I would like you to think about any other risk factors that may arise, through these particular people living in this particular building. (e.g. Is there anyone who may need help to leave the building, if a fire did occur?)

Appendix 3:

Household Questionnaire

Thank you for offering to take part in the Fire Safety Awareness Research Project. I look forward to meeting you and hope that this turns out to be a useful and informative process for us both.

This envelope contains information that I would like you to read before we meet. Please fill out the consent form and respond to the brief questionnaire. Do let me know if you have any questions, or if there is any problem with the meeting time we have made.

<u>As part of this research project, we are gathering descriptive information about those who participate. It would be helpful if you could answer as many of the following questions as possible.</u>

- Do you own or rent your home?

- Please write the number people who live here, and their gender (e.g.: 1 woman and 2 girls; or 2 males).

- How many of the residents of this household fall into each of the following age-groups?

0-5 years	_____	15-19 years	_____	40-49 years	_____
5-9 years	_____	20-29 years	_____	50-59 years	_____
10-14 years	_____	30-39 years	_____	60 yrs or over	_____

- Please describe the residents of this household in terms of cultural groups (e.g. Maori, Samoan, Pakeha …)

- Please estimate the income bracket for this household. (Underline the income bracket you choose.)

Under $15,000

$15,000-$19,999

$20,000-$24,999

$25,000-$29,999

$30,000-$39,999

$40,000-$49,999

$50,000-$59,999

$60,000-$69,999

$70,000-$79,999

$80,000-$89,999

$90,000-$99,999

$100,000 and over

- Of the people living in your household, is there anyone with a physical disability which may limit their ability to detect a fire risk (i.e.: see, hear, smell)?

If “YES”, please describe:

_____

_____

_____

- Of the people living in your household, is there anyone with a physical disability which may limit their ability to respond to a fire in the dwelling (i.e.: use a telephone, move oneself out of the building)?

If “YES”, please describe:

_____

Is there anyone who smokes living in the dwelling?

9) Is there anyone in your household who has experience of house fires? (Either through fire training or through being in a fire.)