Differentiating arsonists: A model of firesetting actions and characteristics

David Canter* and Katarina Fritzon

Investigative Psychology Unit, Department of Psychology, Eleanor Rathbone Building, The University of Liverpool, Liverpool L69 7ZA, UK

It is hypothesized that there will be behavioural consistencies in the actions of arsonists when committing a crime that characterize them. The themes underlying these observable differences can be used to help us understand the nature of the offence. With arson, one such observable difference is hypothesized to relate to the target or focus of the attack. The study tested whether consistencies could be found that distinguish person-oriented from object-oriented arsons. A second proposed facet of arson actions relates to the motivational category underlying the act, being either instrumental or expressive. It was also hypothesized, therefore, that there would be a distinction in the arson actions between fires set for a clear instrumental purpose, and those which may be regarded as emotional acting-out. The hypothesis that these four themes would differentiate arsonists was tested by analysing 175 solved arson cases from across England. The case files were content analysed to produce 42 behavioural variables taken from both the crime reports and witness statements. In order to test the hypotheses of differentiation a smallest space analysis was carried out.

The results support this framework giving rise to four distinct themes to arson from which scales with reasonable alpha scores could be derived. Two relate to expressive acts, (a) those that are realized within the arsonist's own feelings, being analogous to suicide, and (b) those that are acted on objects, like the burning of symbolic buildings. The other two relate to instrumental acts, (c) those that are for personal indulgence, similar to personal revenge, and (d) those that have an object focus such as hiding evidence from a crime. A further test of the validity of these four themes was to examine the typical characteristics of the people who committed the different types of arson. Four scales of arsonists' characteristics were developed. These were found to have appropriate, statistically significant correlations with the four themes.

The implications of these findings for understanding the varieties of arson as revealed through the actions that occur are discussed, as well as the implications for arson investigations. It is speculated that this framework may provide a general model for considering a wide range of crimes.

There are a variety of explanations for arson which suggests that there are also many different forms of arson, each with its own aetiology and associated offender characteristics. Prins (1994) for example, discusses a number of different classifications of arson. He concludes that they tend to confuse the motivations and

*Requests for reprints.
the characteristics of arsonists or produce overlapping typologies that may be of some practical assistance but do not really help in understanding the distinct varieties of arson. But, as with other typologies (e.g. Faulk, 1988; Inciardi, 1970), no empirical studies have tested the validity of the potentially contradictory ways of distinguishing between different types of arson and arsonist.

The contradictions are apparent in the variety of emphases that are given to characterize arson. For example, as a crime it has been regarded both as a category of property offences (Hill, Langevin, Paitich, Handy, Russon & Wilkinson, 1982), because its most obvious feature is the destruction of property, and also as an offence against the person because the motive is often reprisal against a specific individual or group (Barnett, 1992; Lewis & Yarnell, 1951). Pettiway (1987) makes a different distinction, between arson which is retaliatory in motivation and that which is non-retaliatory (e.g. crime concealment). From this perspective the retaliation can be seen as a means of communication by people who lack verbal skills or strong physical capabilities for direct aggression. Geller (1992) goes further in describing arson as a form of emotional expression in pathological adults, where the behaviour is neither a primary symptom of a psychiatric disorder, nor attributable to pyromania,¹ but is used as a means of communicating a desire, wish or need. This is part of an approach that explores variations in the psycho-pathological characteristics of arsonists (Sakheim, Osborn & Abrams, 1991).

These considerations generally present the arsonist as an individual who is unable to have the impact s/he desires by constructive means, or by more direct forms of physical or verbal coercion, and therefore uses firesetting as a way of achieving goals. This is expressed from a functional–analytic perspective, using principles of reinforcement, by Jackson, Hope & Glass (1987). Their 'displaced aggression hypothesis' of arson, which argues that feelings of hostility are redirected away from people and onto property, is supported by the finding that arsonists rated themselves as significantly less assertive than either violent offenders or control groups. This suggests that arsonists experience considerable difficulty in resolving interpersonal conflict in an interpersonal manner—which may promote the redirection of hostility onto property. Secondly, arsonists were found to have less stable or less well-defined constructs of the seriousness of person versus property offences compared to the other groups. There was no significant bias towards rating person offences as being more serious than property offences, reflecting the possibility of the displacement of hostility provoked by an individual onto property.

All writers on arson seem to agree that arsonists have limited capabilities for acting when frustrated or to express other emotions. The differences in each perspective on arson is in the emphases placed on the ways in which the individual acts on the world around him/her in carrying out the acts of arson. A combination of these perspectives leads to the consideration of the whole process of arson as being, on the one hand, derived from a variety of sources and, on the other, having the possibility for different types of target.

¹Pyromania is defined as 'repeated deliberate and purposeful firesetting associated with tension or affective arousal before the act, followed by intense pleasure or relief when setting the fires or witnessing/participating in its aftermath' by the Diagnostic and Statistical Manual of Mental Disorders.
Differentiating arsonists

The approach to arson explored here attempts to model sources and targets within the same framework. This can be done by seeing arson as a process of destructive interactions with the world. As the literature on motivations has revealed, there are many potential sources of arson, but broadly speaking these can all be seen as belonging to one of two categories; whether the source was internal to the offender or external to him. This is a distinction that has many parallels in other areas of psychology, notably in the considerations of locus of control in attribution theory in which the situation is contrasted with the person as a cause. In relation to crime an interesting distinction has been made between acts which are expressive and those which are instrumental (e.g. Fesbach, 1964). The expressive crime is one in which the cause is seen as being within the person, arising from a need to express anger or other emotions, as opposed to activities which have a direct objective of achieving goals of a more instrumental nature.

The nature of the target of an arson can also be differentiated in terms of whether it is external to the arsonist, i.e. an object with which the arsonist does not have any personal identification; or internal in the sense of being part of the offender's personal or social identity, typically another person.

The combination of these two motivating sources and nature of arson targets gives rise to four hypothesized forms of arson as described below:

1. An arson which is instrumentally motivated and directed at an object is an attempt to change aspects of the object where the change will be of direct benefit to the firesetter. A burglar who sets fire to a residence to hide clues to his theft, or the car thief who burns a stolen car for similar reasons are both examples of this type of firesetting. The person who sets fire to a building for insurance purposes, referred to by Vreeland & Levin (1980) as 'arson for profit' can be seen as a more extreme version of this form of arson.

2. Arson which is expressive and directed at an object involves the demonstration of aspects of the arsonist on the external world. This accords with Geller's (1992) description of firesetting as a means of emotional acting out, but the desire to make an impact on the environment also draws attention to forms of arson in which the target has some symbolic, emotional significance to the firesetter.

3. Expressive arson directed at a person often involves emotional distress which is being turned inwards to lead to the disintegration of the firesetter him/herself. Suicide by arson will usually be dealt with in a therapeutic context as a form of depressive acting out, so this is also an aspect of arson that is usually not addressed as such in publications on arson.

4. The final form of arson can be seen as a reaction to frustration by another person which the firesetter wishes to hurt or remove. In this sense the offence has some direct instrumental objective but that objective is focused on changing the emotional state of the firesetter. It is thus a more directed form of revenge from that when the target has a symbolic significance. That act, for example against an institution, is thus more appropriately considered as expressive, whereas the retaliatory act against an individual has a more directly instrumental consequence.

The set of hypotheses outlined above can be seen as hypotheses about ways of classifying arson activities into exhaustive, mutually exclusive categories, known as
facets (Canter, 1995). The two facets proposed here can be summarized in the form of a mapping sentence (Shye et al., 1994) as follows:

Whether or not actions \( a \) relating to arson indicate a(n)

\[
\begin{array}{ll}
\text{Focus} & \text{Source} \\
[ \text{close association with} ] & [ \text{expressive} ] \\
[ \text{the arsonist} ] & [ \text{instrumental} ] \\
[ \text{target of the arson} ] &
\end{array}
\]

\[
\text{Locus of effect}
\]

which is directed at \( [\text{person} ] \) \[\text{do} \] \[\text{do not} \] exist

\[
[\text{object} ]
\]

Where \( a \) are actions drawn from a general population \( A \) of arsons.

**Crime scene-related actions**

The hypotheses of the four distinct styles of firesetting have a number of implications that are open to direct test with the relevant data. First they imply that there is some common set of actions that characterizes all the examples of the systems under consideration. In the case of arson the most obvious defining characteristic is that a person deliberately sets fire to a target which is assumed to be of some relevance to the arsonist, directly or indirectly.

It is also hypothesized that it will be possible to distinguish aspects of arson which indicate some association between the arsonist and his/her targets from other more specific aspects that relate to the nature of the target itself and the motivating factor. These more specific aspects are hypothesized to distinguish between different forms of fire setting. This could be tested by considering whether patterns of co-occurring actions demonstrate different modes of acting, as might be found within an action systems framework (Shye, 1985).

Given that the proposed framework incorporates a number of forms of arson that are not normally treated as psychologically pathological, the hypotheses would be difficult to test if carried out by studying an identified subset of arsonists. The present study therefore sought to draw directly on recorded suspicious, malicious fires in which there was a known firesetter, taking the sample from the records of the fires rather than from known subsets of patients. There is also an added practical value to working with official police records in that any results will have direct relevance to the stage in the criminal investigation at which the records are available but not necessarily a suspect.

**Method**

**Procedure**

The first stage in the procedure was to identify those crime scene-related actions which could meaningfully distinguish between the different offences. This was achieved by examining police
records of solved crimes, a methodology which does not appear to have been previously employed in arson research in the UK. Details of 175 arson cases were obtained from five police forces across England. The cases were all ones where the offender(s) was known and had been dealt with by the courts. Content analysis of the cases yielded 42 offence variables, some of which could be easily identified from the crime scenes alone, and others from witness reports. Because of practical constraints on the data collection, it was not possible to conduct inter-rater reliability tests, however, care was taken to define variables so as to allow a clear decision to be made as to their presence or absence in any particular case. This dichotomous approach to the content analysis was used to ensure maximum clarity and reliability in creating coding variables from what was recognized as being potentially unreliable data. In a previous study with material recorded by the police, Canter & Heritage (1990) demonstrated that an ‘all or nothing’ approach to assignment of cases to categories did produce reliable and interpretable results. A full list of these variables is provided in Appendix A.

The central task of the analysis was to identify themes relating to the two facets of the hypothesized structure, as summarized in the mapping sentence, within the co-occurrence of the actions. This involves, in effect, the comparison of every one of the 42 offence variables with every other, across the 175 cases. In order to carry out such an analysis a data matrix was produced by coding the offences in terms of the presence or absence of each of the variables.

In order to represent the relationship that every variable had to every other variable in a form that allows for examination of the two interrelated facets the data was subjected to smallest space analysis (SSA I), one of a series of non-metric multidimensional scaling procedures (Canter, 1985). The function of the SSA is to test the relationship each of the variables has to every other variable. This is achieved by producing an association matrix, in this case using a Jaccards coefficient of association which only takes account of positive co-occurrence. If two variables are both absent from the records this does not increase the association. This was deemed the appropriate measure of association for data drawn from police records because it can never be certain that absent information was just not recorded.

A geometric representation of the relationships in the association matrix is then generated as with other multidimensional scaling procedures. The algorithm attempts to find the best representation such that the higher the correlation between any two variables, the closer together the points representing them will be. SSA operates on the ranks of the distances between the points and the ranks of the association coefficients. It thus captures the relative sizes of associations and is therefore most appropriate for examining dominant themes in the present form of data.

**Results: SSA of offence behaviour**

A three-dimensional SSA solution was found to have the reasonable Guttman-Lingoes coefficient of alienation of .13 in 10 iterations. Figure 1 shows the projection of the first two vectors of the three-dimensional space. In this figure each point represents an aspect of the arson derived from the content analysis as listed in Appendix A. So the closer together any two variables are in Fig. 1 the more likely when one occurs in an offence that the other will also occur. By contrast, for illustration, it is very unlikely that when a public building is the target that a suicide note will be left. These two variables are on opposite sides of the space.

**Focal aspects of arson**

The focus facet hypothesized that there would be aspects of arsons that would indicate some association between the arsonist and the target and that these would be distinct from those actions that related to the nature of the target. Furthermore, the current framework proposes that the actions that do indicate some form of significance of the target to the offender will dominate.
In terms of the SSA plot the general aspects that are characteristic of a system of relationships in general will be placed at the centroid of the space. A number of specific hypotheses can therefore be proposed about the actions that will be found as central to the configuration. One is that they will indicate the proposed degree of significance of the offence to the offender. A second is that they will be the most frequent set of variables. If frequency is linked to associative significance in this way then gradations in frequency would be hypothesized to exist as well, with the most target specific variables being the least frequent.

This hypothesis of a focus facet that distinguishes between the central significance of the offence and its different forms of target is directly comparable to the focus facet reported by Canter & Heritage (1990) for rape. In that case it was the surprise, sexual attack in which the victim's reactions were ignored that was at the centroid of the configuration, occurring in more than 65 per cent of the cases.
The very low frequency variables were found at the edge of the plot and characterized the different styles of rape.

Figure 2 shows the frequencies of each of the variables superimposed on the same SSA configuration as Fig. 1. This reveals clear contours to distinguish variables that occur in more than 60 per cent of cases, in 40 to 59, 20 to 39 and in 2 to 19 per cent of cases. The pattern is very similar indeed to that reported by Canter & Heritage (1990) for rape.

Those actions which occurred in 60 per cent or more of the arsons in this sample, all in the central region, are:

- the offence occurred less than a mile from the offender’s home
- the offender did not alert anyone after setting the fire
- the fire was set as opposed to a missile being thrown
- the offender knew the owner of the fired property
- the offence occurred on a weekday
These arson-related actions do appear to indicate a significance and involvement of the arsonist and a determination to ensure the fire had some real destructive effect. They therefore do lend credence to the proposal that arson can be examined as an interaction between the offender and the target, in which there are gradations in the actions from those that are focused on achieving destructive objectives to those that are specific to the interactions with the targets in question.

This focus facet thus also indicates that the differences in the themes of arson will be revealed through the lower frequency variables that relate to the source of the actions and the locus of its desired effects.

**Themes of arson**

*Source of action.* The modulating facet of focus indicates that the distinction between expressive and instrumental actions will be clearest at the periphery of the plot. So actions that indicate the individual is revealing emotions and have little obvious subsequent material significance are hypothesized to be on the opposite side of the plot to those actions that have some direct obviously functional consequence. Figure 3, which is the same configuration as Fig. 1, shows that at the top are actions that have non-specific triggers, that are serial, involve drugs and attacks on the arsonists themselves, as well as suicide notes. Public buildings are also, interestingly in this region, as are hospitals and businesses, suggesting that in this sample these are targets selected because of their emotional significance rather than as a form of arson for profit. This accords with the anecdotal comments that arson for profit is often difficult to detect in relation to ‘professional’ business-related arson and so is unlikely to have featured in the present sample.

The bottom half of the plot contains a number of actions that indicate the instrumentality of the arson; cars set alight, the arson being part of a threatening activity, a partner suffering the effects of the arson, accelerants and materials brought to the scene, as well as the arson being part of a theft. These all accord with the proposal that the arsonist was trying, essentially, to create some change on people and the environment rather than his or her own emotional state. Interestingly, school buildings are part of this process, indicating a form of revenge that contrasts, for example with hospitals at the other side of the plot.

*Locus of effect.* The distinction between expressive and instrumental origin of the offence are hypothesized to be different from those that deal with the target of the offence. The partitioning of the SSA space that accorded with these distinctions would therefore be expected to be orthogonal to the partitioning between person and property offences. It is thus hypothesized that both the expressive and instrumental regions will have targets that are objects or persons.

Figure 3 shows how the original SSA presented in Fig. 1 can be partitioned to discriminate between whether the target is a property, external to the agent, or some form of person that may be part of the arsonist’s self-identity.

*Objects.* To the right of the plot the variables: business, public building, school, hospital/institution and miscellaneous/uninhabited property indicate that the
target of these offences was an object. As anticipated by the modulating facet, those variables that most distinctly indicate the target are at the periphery of the plot. The other variables associated with these types of arsons relate to the nature and benefits that the arsons provide for the offender. These are repetition, both on the same occasion and over time, illegal entry to and theft from the premises and more than one offender being involved. These variables all accord with what would normally be considered property crimes.

**Person.** In contrast, to the left side of the plot the variables: victim known, self and victim partner indicate that a person was the likely target of these arsons. Moreover, typically they were people who had some significance to the arsonist. These characterize those arsons that can be considered to be violent crimes ‘against the person’. The person fires tend to be more serious, involving multiple seats and accelerants. There was also evidence of planning and targeting in these cases, and lives were either endangered deliberately or by the location of the fire.
Modes of arson

Because the two primary facets of source and target were orthogonal to each other they do create four subsets, of the form previously suggested.

Expressive person. This form of arson behaviour may be an attempt to restore emotional equilibrium, or alleviate distress by seeking attention from family or the authorities. The desire to set fires emerges internally, and coupled with the need for attention, results in the actualization of the firesetting also being directed internally.

Within the person-oriented offences, there was a subgroup of cases where the individual either set fire to him/herself, or to objects placed around them, in what would appear to be an act of suicide. However, in the few cases classified as this type of arson, none of the individuals actually died. In one case, the arsonist attempted to set fire to himself in front of his partner and attending fire officers, and in others the time of day chosen was such that neighbours were alerted by smoke before any serious damage could be done. These cases, therefore are probably better viewed as parasuicides or cries for help.

Instrumental person. These arsons often occur as a direct result of some sort of dispute between the offender and another person, usually an ex-partner, or sometimes an ex-employer. This external event causes anger and a sense of injustice within the individual which he may attempt to redress by retaliative arson. Thus this form of arson is the instrumental aspect of the person-oriented region. The arson behaviour was directed externally, in other words at another individual. These fires often involved prior threats and violence towards the victim, and there was usually some specific discernible trigger which occurred immediately prior to the firesetting indicating the reactive nature of this type of behaviour. These arsons are classified as instrumental because they served a specific purpose, usually revenge.

Expressive object. These fires tended to be of a serial nature with the arsonist often targeting particular types of public buildings. The fact that these individuals commit serial offences suggests that there is some type of intrinsic fascination for fire which relates to the internal emergence of the behaviour. The targeting of particular buildings which, in their perception, cause a lot of attention to be focused on the individual may also reinforce the firesetting tendencies. These fires were often preceded by some kind of emotionally charged event as indicated by the variable 'non-specific trigger'. This reinforces the notion that the firesetting in these cases acted as a way of obtaining emotional relief. There is some suggestion in the psychiatric literature that some individuals use arson as a means of communication emotional states (e.g. Geller, 1992). This type of firesetting may be committed by such individuals.

These fires tended to involve repetition over time and prior arson by the offender. The target in these cases was often a public building or hospital, which may have held some meaning for the individual, for example, he may feel anger against authority figures or the symbol that a hospital represents. Another reason for targeting these types of buildings may be that they usually attract a number of fire engines and crowds thus creating vicarious attention for the arsonist. This
Differentiating arsonists

hypothesis is supported by the fact that the arsonists often remained or returned to
the scene of the fire in order to observe or participate in its aftermath.

*Instrumental object.* This type of arson can be seen as opportunistic in that the
decision to commit the crime may only be arrived at when the individual recognizes
the environmental possibilities. It suggests a form of criminal sophistication in
which arson is part of the repertoire for achieving criminal goals. This type of
firesetting activity is often committed by groups of youngsters where the choice of
target is opportunistic rather than selective. It is not so much personally meaningful
as just available. The variables illegal entry and theft from premises were found in
this region, also indicating instrumentally, where the firesetting can be seen as an
externally generated (perhaps by peer pressure) part of the overall activity of
breaking into properties.

*Scales of arson modes*

The four modes of arson were proposed to reflect discernible themes to any given
arson. This implies that the sets of actions identified as representing each of those
themes should form a scale in the sense that their combined existence is a
reasonable indication of some underlying dimension. One direct way of testing this
is to calculate Cronbach's α for each of the sets of actions that define a region. The
actions used and the α value for each theme are given in Table 1.

The α values in this table are reasonable, when it is remembered that the data are
derived from official reports in which there is considerable room for omission and
ambiguity. The instrumental person mode has the highest Cronbach's α, possibly
because this revenge-like arson is the most clearly represented in the present
sample. Curiously, the two themes in which objects are the target have lower
scale values, reflecting the smaller number of actions that were recorded here,
presumably because there is less information of psychological relevance available
when there is no obvious victim.

**Offender characteristics**

A second set of hypotheses for the current classification system of arson is that
individuals who set fires according to a particular mode of action will be distinct
from those operating in a different mode. These hypotheses are derived from the
assumption that the mode of action that typifies any arson is a reflection of the
characteristics of the arsonist. This is a specific example of the general thesis
underlying investigative psychology that the way in which a person commits crimes
is a reflection of their characteristics as people (Canter, 1995). In accordance with
the results of the previous section, four subsets of individuals are hypothesized,
each representing a dominant theme of the personal features that are typical for
that mode of action.

The *expressive person* mode, that reflects a strongly emotional reaction to personal
concerns, would be hypothesized as typical of people with known emotional
Table 1. Scales of actions

<table>
<thead>
<tr>
<th>Instrumental person</th>
<th>Instrumental object</th>
<th>Expressive person</th>
<th>Expressive object</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accelerant</td>
<td>Illegal entry</td>
<td>Lives endangered deliberately</td>
<td>Drug use</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Uninhabited property</td>
<td>Lives endangered by location</td>
<td>Hospital/institution</td>
</tr>
<tr>
<td>Argument</td>
<td>Multiple offenders</td>
<td>Multiple seats of fire</td>
<td>Prior arson</td>
</tr>
<tr>
<td>Car</td>
<td>Did not alert</td>
<td>Own home</td>
<td>Public building</td>
</tr>
<tr>
<td>Planned</td>
<td>Outside</td>
<td>Remained</td>
<td>Remained</td>
</tr>
<tr>
<td>Targeted</td>
<td>Public view</td>
<td>Residential</td>
<td>Serial</td>
</tr>
<tr>
<td>Threats</td>
<td>Spree</td>
<td>Self</td>
<td>Non-specific trigger</td>
</tr>
<tr>
<td>Threat of arson</td>
<td>Theft</td>
<td>Suicide note</td>
<td></td>
</tr>
<tr>
<td>Trigger specific to victim</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victim partner</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victim known</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Witness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>α=.83</td>
<td>α=.60</td>
<td>α=.75</td>
<td>α=.62</td>
</tr>
</tbody>
</table>

problems that may well have led to some form of treatment for mental illness. By contrast the instrumental object mode, in which the arsonist is using firesetting as part of a repertoire of tools to achieve criminal ends would be expected to have a range of criminal convictions. The instrumental person mode sits between the first two in being used to achieve instrumental objectives, but in this case objectives are of a more directly personal kind. Here then the person's relationships to others is the distinctive theme, especially the breakdown of these relationships. In opposition to this is the expressive object mode in which the personal emphasis has no direct instrumental quality, but is a means of demonstrating some general emotional reactions. Here the act of arson itself is a direct means of expressing those feelings and thus would be expected to be an important part of the person's way of dealing with the world, perhaps best shown in their acts of arson being repeated against essentially anonymous targets.

These hypotheses are open to direct empirical test by examining whether the characteristics of arsonists do indicate themes that relate to the four modes. There is also the subsidiary hypothesis as to whether any such themes identified have the appropriate relationships to each other. These hypotheses were tested by examining the intercorrelations between all the background variables available on the arsonists in the current sample.
Differentiating arsonists

Method

Procedure

The 175 police records which yielded the 42 behavioural variables used for the first analysis also contained information about the offenders responsible, such as their age at arrest, living circumstances, occupation and psychiatric history. A total of 23 such variables were obtained (listed in Appendix B).

A smallest space analysis was conducted on these variables in order to establish whether themes of reliably co-occurring background characteristics existed.

Results: SSA of offender characteristics

The three-dimensional solution has a Guttman–Lingoes coefficient of alienation = .17 in seven iterations, indicating a good fit. Figure 4 below shows the one-by-two-dimension projection. As might be expected, there are a set of characteristics that are typical of the majority of arsonists and thus help to define the nature of this sample. They are at the centre of the SSA configuration, demonstrating that these arsonists are usually unemployed, white males who have no criminal record (Fig. 5). Beyond these general characteristics the more personal aspects of the offenders, especially indications of their social relationships and skills, are found further from

![Figure 4. SSA of firesetter characteristics.](image-url)
Figure 5. SSA showing frequencies of characteristics.

the centre of the plot (Fig. 6). It is in these aspects that the distinct thematic qualities of the offenders can be found.

**Themes in firesetters’ characteristics**

**Young offender.** As hypothesized there is a set of offenders who have been cautioned previously for criminal activites and have come to the attention of the social services. These tended to be the younger offenders who as a consequence were living at home and were of school age (mean age = 16 years). The variables used to define this region are thus: caution only, living with parents, school pupil, social services. These items give a Cronbach’s α of .64. This is quite low for a unidimensional scale, but may be a consequence in part of the very low frequency of some of these items.

**Repeat arsonist.** The expressive object theme was proposed to reflect the person for whom arson was a significant aspect of their ways of dealing with others and as a consequence would be reflected in their specifically absenting themselves to set fires, as well as making fire alarm telephone calls. Thus it was found that the variables of the individual having a history of setting fires are close to that of making false alarm calls as well as having usually come to the attention of police and social services, often for arson-related matters. Although the SSA was run with
the gender variable ‘male’ rather than ‘female’ in fact most of the arsonists in this group were women (63 per cent). The mean age of the offenders in this group was 25 years which is also the mean for the sample as a whole. The youngest offender in this group was 12 and the oldest was 60 years.

The following characteristics form this region: AWOL, false alarm calls, personality disorder, prior arson, social services. These variables give a Cronbach’s $\alpha$ of .67.

**Psychiatric history.** This theme is seen as fundamentally disintegrative, in which arson emerges out of the person’s self-destructive emotions; suicide attempts and a history of mental illness are therefore strongly hypothesized to intercorrelate if this theme is to be identifiable. The region with all the variables together that relate to these aspects is therefore a strong indicator of the validity of this theme. Looking at the individuals who had some form of psychiatric history ($N = 51$) it was found that most (84 per cent) usually received a psychiatric diagnosis of either depression (51 per cent) or psychosis (33 per cent) and had made suicide threats (57 per cent) and attempts (43 per cent) prior to setting a fire. In order to have accumulated such a history it is usually necessary for such arsonists to be slightly older (mean age = 29).

The following variables make up this theme of arsonist characteristics: depression, psychosis, psychiatric treatment, suicide attempts, suicide threats.
Table 2. Scales of arsonists’ characteristics

<table>
<thead>
<tr>
<th>Failed relationship</th>
<th>Psychiatric history</th>
<th>Repeat arsonist</th>
<th>Young offender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcoholism</td>
<td>Depression</td>
<td>AWOL</td>
<td>Caution</td>
</tr>
<tr>
<td>Cohabiting</td>
<td>Psychosis</td>
<td>False alarms</td>
<td>Living with</td>
</tr>
<tr>
<td>Married</td>
<td>Psychiatric institution</td>
<td>Personality disorder</td>
<td>Parents</td>
</tr>
<tr>
<td>Qualifications</td>
<td>Suicide attempts</td>
<td>Prior arson</td>
<td>School pupil</td>
</tr>
<tr>
<td>Separated</td>
<td>Suicide threats</td>
<td>Social services</td>
<td>Social services</td>
</tr>
<tr>
<td>Unskilled</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\alpha = .38$</td>
<td>$\alpha = .73$</td>
<td>$\alpha = .67$</td>
<td>$\alpha = .64$</td>
</tr>
</tbody>
</table>

These items had a Cronbach’s $\alpha$ of .73 which is quite high given that the material is collected from police records with all their inherent unreliabilities and thus lends support to regarding these items as forming a scale.

Failed relationship. Here the arson is seen as a direct means of affecting a person significant to the arsonist and as a device the offender uses to achieve focused revenge. The variables in the region that relates to the personal characteristics typical of this mode of transaction are as follows: alcoholism, cohabiting, married, qualifications, separated/divorced, unskilled employment. These offenders were the oldest in the sample (mean = 31 years) which is not surprising given that most had been married or had had at least one long-term partner. The variables in this region do not form a reliable scale, having a Cronbach’s $\alpha$ of only .38. This is due to the negative correlations between ‘cohabiting’, ‘married’ and ‘separated/divorced’. Despite these negative correlations, however, the appropriateness of the label ‘failed relationship’ is derived from the fact that the variables all fall in the same region of the SSA space, giving empirical support to their conceptual similarity.

A summary of the four scales derived from their Cronbach’s $\alpha$ is given in Table 2.

Associations between actions and characteristics

As indicated, one important set of hypotheses in the present study is that there will be clear relationships between the modes of action typical of the arson and the appropriate characteristics of the arsonist. To test these hypotheses Spearman’s $\rho$ was calculated between scores derived from each of the two sets of four scales. The summary of all these correlations between each of the four action scales and each of the four characteristic scales are presented in Table 3.

All the action modes correlate significantly with all the appropriate characteristics’ themes at $p < .001$. The instrumental object actions correlation with the
Table 3. Correlations between scales of actions and characteristics

<table>
<thead>
<tr>
<th></th>
<th>Psychiatric history</th>
<th>Young offender</th>
<th>Failed relationship</th>
<th>Repeat arsonist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expressive person</td>
<td>.38</td>
<td>-.33</td>
<td>.21</td>
<td>.03</td>
</tr>
<tr>
<td>Instrumental object</td>
<td>-.28</td>
<td>.44</td>
<td>-.31</td>
<td>.04</td>
</tr>
<tr>
<td>Instrumental person</td>
<td>n.s.</td>
<td>p&lt;.001</td>
<td>p&lt;.001</td>
<td>n.s.</td>
</tr>
<tr>
<td>Expressive object</td>
<td>.42</td>
<td>-.05</td>
<td>-.09</td>
<td>p&lt;.001</td>
</tr>
</tbody>
</table>

young offender characteristics is .44. The correlation between the expressive person and psychiatric history is .38. The expressive object actions and characteristics of the repeat arsonist correlate at .56 and the instrumental person and failed relationship variables at .49. The relationships between actions and characteristics from orthogonal facets all have negative correlations, which are all significant at $p<.001$ except for the expressive object against the failed relationship variables.

Furthermore, the majority of the adjacent modes have no significant relationships with each other; expressive person actions and repeat arsonist characteristics; instrumental object actions and repeat arsonist characteristics; instrumental object actions and psychiatric history characteristics; expressive object actions and young offender characteristics. However, a bias in the relationships found in the current data set is revealed by the fact that the expressive object actions have a significant ($p<.001$) correlation with the psychiatric characteristics of .42, the expressive person actions have a slightly less significant ($p<.005$) correlation with the failed relationship characteristics of .21, and the instrumental person action scale has a strongly negative correlation with the young offender characteristics ($-56$, $p<.001$). These apparent anomalies, however, can be explained by considering the nature of each of the four groups of offenders. Firstly, the expressive object arsons, do also reflect some of the psychiatric history characteristics as well as the repeat arsonist characteristics. These two scales of characteristics both contain variables relating to affective dysfunctioning and would both therefore be expected to correlate with the expressive object mode of functioning which relates to emotional imbalances within the individual. Secondly, the expressive person actions represent an attempt to draw attention to emotional distress within the individual by directing the fire-setting behaviour internally. The cause of the distress is usually also internal, i.e. in the form of psychiatric problems, but can of course also come from an external source such as the breakup of a relationship. A correlation with the failed relationship variables, therefore, is not unexpected. Finally the negative correlation between the instrumental person actions and young offender characteristics is also to be expected given that these arsons are usually directed at ex-partners and
involve a degree of targeting and planning which might be considered beyond the functional capacity of most school pupils.

Overall, then, this system of correlations between actions and characteristics provides strong support for the hypothesis that the modes of functioning revealed in the acts of arson do tend to have the expected correlations with the appropriate characteristics of the arsonists.

Conclusions

The current work differs from previous attempts at classifying arsonists in a number of ways. Firstly, it is a direct empirical test of a classification scheme based on information derived from arson investigations. Thus it is based on behavioural indicators rather than inferred motives. Whilst there are clearly weaknesses and inherent unreliabilities in such data, it has nonetheless been possible, by using carefully constructed content analysis dictionaries, to demonstrate reliable structures.

Secondly, a general model has been used to derive a faceted framework for classifying arson by considering both the source of the arson and the locus of its impact. Thirdly, it has been possible to support hypotheses about the distinguishing characteristics of arsonists derived from this general model. These results have both theoretical implications in terms of enriching our understanding of arson and practical implications in terms of arson investigation and approaches to treatment.

The approach taken here brings together a number of different perspectives and helps to resolve some of the apparent contradictions in previous attempts at classifying arson. Some of these contradictions, for instance, dealing with arson as person oriented or property oriented were derived from its classification on the basis of some overt motive, but it is now clear that different motives may be post hoc interpretations of behavioural themes. For example, the instrumental object theme that is a dysfunctional adaptation, achieving instrumental objectives by manipulation of aspects of the environment could represent what others have called 'motives' of vandalism, insurance fraud, excitement, desire for acceptance by peer group and politically motivated arsons. The particular circumstances may lead to an interpretation of the arson as 'motivated' by a number of different reasons, but from the present perspective the crucial point is the source of the determination to set fires and the objective that is the target.

The model proposed here is consistent with the view that arson has a number of very different psychological origins. Some arsons may be the consequence of a deviant life-style, being used as a criminal tool, for people who have little other intellectual or physical resource. Other forms of arson may derive directly from the person's own self-destructive tendencies. For others it is a product of their inherently limited way of dealing with other people. A fourth group for whom setting fires is a dominant means of expressing anger and frustration can also be identified. Different treatment programmes would be appropriate for the different forms of arson, for example by dealing with the self-destructive urges, or by addressing directly the mode of anger expression.
Differentiating arsonists

The present study is rather different from earlier studies in that it has not involved interviewing arsonists. Such interviews may be unreliable for at least two reasons. One, that it is not always possible for individuals to explain their own actions, or they may try to rationalize what is essentially an irrational or unreasonable response to provocation. A second is that people who have committed acts of great destruction and shown a lack of concern for human life should perhaps not always be relied on to tell the truth about their behaviour. For these reasons it is important to complement studies based on interviews with the records of the event utilized in this study. Certainly the current results open up some interesting lines of questioning with arsonists, particularly in relation to their feelings about the fire setting and its target.

The identification of these four themes in arson behaviour has a number of other implications for further study. It would certainly be useful to attempt to replicate the results using arsons drawn from different sources, for example unsolved cases or insurance records. Because this sample was drawn only from solved police cases, there was probably an overrepresentation of certain types of offences, for example ones where the offender was known to the victim. Conversely, some kinds of arsons were not present at all, for example, insurance fraud or politically motivated fires. Although, as previously mentioned, some of these might be expected to fall under the category of instrumental object arsons, it is also likely that they would contain some of the features associated with the instrumental person fires such as planning, use of accelerants and material brought. Indeed, the model does allow for various hybrids derived from adjacent themes and a larger more varied data base would help to test whether such hybrid themes did exist.

The implications of this study extend to the actual investigation of fires. For example, the finding that object-oriented arsons are associated with repetition, coupled with the fact that the offenders tend not to travel far from home, suggests the importance of implementing surveillance in areas recently subjected to arson attacks. It is also likely that offenders responsible for arsons to public properties, including schools and hospitals, will be known to police for previous firesetting. Another implication is that where an arson is relatively serious, showing evidence of planning and the use of materials such as accelerants, it is likely that it represents a targeted attack and that the victim will know the perpetrator.

The model proposed here does provide a framework within which a diversity of perspectives in the literature can be shown to complement one another, rather than being in conflict. It also shows that hypotheses about the relationships between the details of the offence and the characteristics of the offender can be elaborated and tested. It is therefore plausible that the model will also be relevant to other forms of criminal activity.

References


Appendix A: Offence variables

(1) Residential: This refers to a property which at the time of the fire was being used for residential purposes. If the property was derelict or uninhabited (as opposed to simply unoccupied) at the time, then it would not be coded as residential. An exception to this would be an uninhabited flat contained within a block of flats some of which were inhabited. Also a property which was known to contain 'squatters' would be classified as residential.

N = 74; 42 per cent

(2) Business: Again, the property would have to currently be in use as business premises. A disused unit on an industrial estate would not be coded as business. Other exceptions include allotments and pigeon lofts which would be coded as uninhabited.

N = 19; 11 per cent

(3) School: A fire which occurs in any area of an educational establishment would be coded as school. For example, if fire is set to waste bins outside the school, this would be coded as both miscellaneous and school.

N = 8; 5 per cent

(4) Civic building: This includes any type of building to which the public have access, e.g. library, church, town hall, law courts, police station, etc.

N = 13; 7 per cent

(5) Hospital/institution: Again, if the fire is set on any part of the institution's grounds then it is coded as institution.

N = 11; 6 per cent

(6) Car/vehicle: Any type of vehicle which is used for transportation of goods or people, is coded as car/vehicle, including bicycles and boats.

N = 28; 16 per cent
Differentiating arsonists

(7) Misc./uninhabited/derelict property: Misc. applies to items fired which were not inside a property, for example a rubbish bin or park bench. However, anything which is fired inside a property will be coded as that property, e.g. a rubbish bin inside a school is coded as school. Uninhabited or derelict properties can be both commercial and residential properties which are currently not in use. 
\[ N = 45; \ 26 \text{ per cent} \]

(8) Self: If an individual starts a fire in their own home, and then makes no attempt to leave or alert anyone, then this is coded as self. 
\[ N = 12; \ 7 \text{ per cent} \]

(9) Own home: This is coded in addition to residential and/or self. 
\[ N = 43; \ 25 \text{ per cent} \]

(10) Targeted property: If there is any evidence to suggest that a specific property was fired for a particular reason, then this is coded as targeted. In other words it must be apparent, or readily inferred that the offender(s) would not have set fire to anything other than that object. 
\[ N = 96; \ 55 \text{ per cent} \]

(11) Planned: For example, if materials were brought to the scene, like petrol or matches, then this would suggest planning. Also if the individual made an effort to avoid detection, e.g. wearing gloves when handling petrol containers. 
\[ N = 93; \ 53 \text{ per cent} \]

(12) Victim known: This would generally go along with targeting and includes institutions or governing bodies that the offender has been involved with, e.g. a school he/she has attended or council-owned property if he/she is a council tenant. 
\[ N = 110; \ 63 \text{ per cent} \]

(13) Victim (ex-)partner: This variable would also be coded as present if the offender fires property belonging to someone close to his/her (ex-)partner, e.g. a family member or new partner. The rationale for this is that that person would not have been targeted were it not for their association with the (ex-)partner. 
\[ N = 34; \ 19 \text{ per cent} \]

(14) Prior violence/argument with victim: This refers to any dispute, preferably heated, occurring within a reasonable time frame (usually not more than a month) of the arson. 
\[ N = 60; \ 34 \text{ per cent} \]

(15) Prior threats towards victim: This includes verbal or physical threats of an overt or implicit nature. 
\[ N = 41; \ 23 \text{ per cent} \]

(16) Prior threat of arson: If the offender has made any threatening remarks with reference to fires, even in an abstract sense such as, 'I once knew someone whose house burned down', or 'be careful you don't leave matches lying around; someone might get hold of them', then these account as threats of arson. 
\[ N = 15; \ 9 \text{ per cent} \]

(17) Prior arson: This is coded if the offender has set any fires prior to the current offence. Although this variable is duplicated in the offender variable list, it is included here in order to identify which other actions are associated with prior arson. 
\[ N = 45; \ 26 \text{ per cent} \]

(18) Multiple items fired: This refers to the objects which have actually ended up on fire, rather than secondary objects used to start that fire. In other words, if multiple waste bins or skips are fired then this variable would be coded as present, but if multiple bits of newspaper are used to set fire to one waste bin, then this variable would not be coded. 
\[ N = 64; \ 37 \text{ per cent} \]

(19) Multiple seats of fire: This refers to initial ignition points of the item(s) fired. For example, if a house is fired by pouring petrol in one room and holding a match to a curtain in another room, then the fire would be coded as having multiple seats. The number of seats of a fire are usually stated in the investigating fire officer's report. 
\[ N = 29; \ 17 \text{ per cent} \]

(20) Set fire: If the offender has actually placed a burning object (e.g. match or lighted piece of paper) to the property he wants to fire, then this is a set fire. If the burning object has been thrown, e.g.
a petrol bomb, or burning pieces of paper have been dropped onto an object from above, then this is not coded as a set fire.

*N* = 147; 84 per cent

(21) Accelerant used: Again, there is usually mention of an accelerant in the fire investigator's report. *N* = 63; 36 per cent

(22) Material brought: Anything which the offender brought for the specific purpose of starting or accelerating the fire, would be coded as this. It's important that the material is something which he would not normally be carrying, e.g. matches or a cigarette lighter is ambiguous particularly if the individual is a smoker.

*N* = 96; 55 per cent

(23) Lives endangered deliberately: If the offender knew that the property was occupied at the time of the fire and made no attempt to alert the occupants, then this is coded.

*N* = 33; 19 per cent

(24) Lives endangered by location: A fire in any residential property, or building attached to a residence which is not completely detached, has the potential to endanger lives.

*N* = 92; 53 per cent

(25) Did not alert anyone: If the offender left the scene of the fire without subsequently alerting either the fire brigade or any other person, then this variable is coded.

*N* = 132; 75 per cent

(26) Remained at/returned to scene: This is where the offender either remains at the scene, or returns while the fire is still burning, or returns to the same property to set another fire.

*N* = 81; 46 per cent

(27) Suicide note: This is coded not only in the presence of an actual suicide note, but if the offender has alerted anyone prior to the fire of their intention or wish to commit suicide.

*N* = 4; 2 per cent

(28) Alcohol use: The offender may not state that he has consumed alcohol, but if a police officer or witness mentions that the offender appeared to be drunk or smelled of alcohol then this is coded.

*N* = 84; 48 per cent

(29) Drug use: This refers to any recreational, i.e. non-prescription drug, including solvents.

*N* = 22; 13 per cent

(30) Spree: If the offender sets more than one fire with a gap of no more than 24 hours then this is coded as spree firesetting.

*N* = 33; 19 per cent

(31) Serial: If the offender sets more than one fire with a gap of more than 24 hours then this is coded as serial firesetting. However, if the gap is a matter of years rather than weeks or months then this would not be serial, but the offender would be coded as having prior arson in his history.

*N* = 32; 18 per cent

(32) Weekday: A weekday is classified as being between 00:01 on a Monday and 16:59 on a Friday.

*N* = 97; 55 per cent

(33) Daytime: If the offence occurs during daylight hours, this is classified as daytime. Note that this will depend on the time of year; e.g. 21:00 in July would be daytime whereas in November it would not.

*N* = 50; 29 per cent

(34) Distance travelled less than 1 mile: This is coded if the offence occurs less than a mile from where the offender either lives or was based immediately before the firesetting. In other words, if the offender was at school all day, and then set a fire on the way from school to home, then the important measurement would be from the school to the offence rather than from the offence to the home.

*N* = 133; 76 per cent

(35) Forced/illegal entry: If the offender was required to make some effort to obtain entry to the fired property, then this would be coded as forced/illegal entry. Also, if the offender could be said to be trespassing, e.g.in a hay barn which has open access, this variable would be coded as present.

*N* = 44; 25 per cent
Differentiating arsonists

(36) Theft from premises: This variable would be coded if any property is taken either before or after the firesetting.

N = 16; 9 per cent

(37) More than one offender: The other individual need not be instrumental in the actual setting of the fire, e.g. they could be acting as a look-out. If another person is present during the firesetting and they do not actually try to stop the offender then they are counted as a co-offender.

N = 45; 26 per cent

(38) Outside: If the fired object is itself outside, or the individual sets fire to a house by throwing a fire bomb or inserting lighted material through the letter box then this is coded as being outside.

N = 85; 49 per cent

(39) Witness: If the firesetting takes place in front of another person who is not a willing participant, i.e. explicitly or implicitly does not condone the act, then he/she is coded as a witness.

N = 37; 21 per cent

(40) Public view: If the firesetting occurs in a place and time where the offender could potentially be seen by passers-by, then this is coded as being in public view. If the firesetting occurs at a time where there are unlikely to be other people around, but in a place which usually has CCTV, e.g. a car park, then this would also be coded as public view.

N = 103; 59 per cent

(41) Trigger specific to victim: If the firesetting occurs immediately following, or within a reasonable time period of an argument or other, usually emotional trigger, and is targeted at a specific person or property, then that is a victim-specific trigger.

N = 72; 41 per cent

(42) Non-specific trigger: If the firesetting occurs immediately following, or within a reasonable time period of an argument or other, usually emotional trigger, and there is no obvious targeting of a specific person or property, then that is a non-specific trigger.

N = 29; 17 per cent

Appendix B: Offender variables

(1) No CRO: The offender has no previous convictions of any kind.

N = 94; 54 per cent

(2) Previous arson: This is the same variable as in the Offence Variables list.

N = 45; 26 per cent

(3) False alarm calls: This may be known to the emergency services either because they have traced the offender’s number, or because he/she has confessed to making false alarm calls.

N = 14; 8 per cent

(4) Male.

N = 145; 83 per cent

(5) Married: This is coded even if the offender is separated from his/her spouse, but not if they are divorced.

N = 19; 11 per cent

(6) Co-habiting: Again, this variable is coded even if the offender has recently moved out of the shared property (for definition of ‘recently’ see below).

N = 12; 7 per cent

(7) Recently separated/divorced: Under ordinary circumstances, this variable would be coded if the separation has occurred not more than 6 months prior to the arson attack. If, however, circumstances make it clear that the offender still feels acrimony towards the partner or his/her new partner, then this variable would be coded.

N = 30; 17 per cent

(8) Living with parents: The offender is living in the care of his/her parents or legal guardians.

N = 67; 38 per cent

(9) School pupil: If the offender is still of school age (i.e. 16 or under) then this is coded even if he/she is not actually attending a school.

N = 38; 22 per cent
Unemployed: This is only coded if the offender is chronically unemployed. If the offender was employed until just before the arson, or has a history of employment interspersed with short periods of unemployment, then the nature of the main type of employment is coded. 

\( N = 95; 54 \text{ per cent} \)

Manual work: Either skilled or unskilled manual work, e.g. plumber, labourer, factory worker. 

\( N = 22; 13 \text{ per cent} \)

Qualifications: This is coded if the offender has obtained secondary or tertiary qualifications of any kind. 

\( N = 40; 23 \text{ per cent} \)

White. 

\( N = 162; 93 \text{ per cent} \)

Depression: This is coded if the offender has come to the attention of psychiatric services and been diagnosed as suffering from depression, or if he/she has attempted or threatened self-harm behaviour. This may also be coded if the offender states that he/she feels depressed or if any person known to the offender has remarked that they seem to be depressed. 

\( N = 26; 15 \text{ per cent} \)

Psychosis: Again this is coded if the offender has received a psychiatric diagnosis of psychosis. This is also coded if he/she acts in an extremely bizarre way before, during or after the firesetting offence. 

\( N = 17; 10 \text{ per cent} \)

Personality disorder: This is coded if the offender appears to be slightly 'abnormal' in any way, for example, has set a large number of fires previously. Juvenile firesetters who have a conduct disorder are also given the generic classification of personality disordered. 

\( N = 40; 23 \text{ per cent} \)

Psychiatric treatment: If the offender has ever been in the care of psychiatric services, either as a voluntary or day-care patient, then this is coded. 

\( N = 20; 11 \text{ per cent} \)

Alcoholism: This is coded if the offender appears to have a significant alcohol problem, for example if he/she has (had) relationship difficulties because of alcohol, or if he/she has a number of alcohol-related convictions. 

\( N = 34; 19 \text{ per cent} \)

Suicide threats: If the offender has ever threatened to self-harm to anyone, or mentions it during the police interview, then this is coded as suicide threats. 

\( N = 29; 17 \text{ per cent} \)

Suicide attempts: If the offender has ever self-harmed or has been classified by authorities such as school as 'suicidal' then this is coded as suicide attempts. 

\( N = 22; 13 \text{ per cent} \)

Caution only: If the offender has come to the attention of police, but not been formally charged with any offence, then this is coded as Caution only. 

\( N = 17; 10 \text{ per cent} \)

Social Services: If the offender, usually a juvenile, has come to attention of social services, e.g. if they have been taken away from their parents to a juvenile home. 

\( N = 39; 22 \text{ per cent} \)

AWOL: At the time of setting the fire, the offender was supposed to be somewhere else, e.g. at school or at work. 

\( N = 14; 8 \text{ per cent} \)