

## The Application of an Action System Model To Destructive Behaviour: The Examples of Arson and Terrorism

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**This article argues that criminal and deviant behaviour can be productively viewed through an action system framework. The idea is developed by considering two forms of destructive behaviour: arson and barricade-hostage terrorist incidents. Two studies are presented. The first study tests the hypothesis that different forms of arson will reflect the four dominant states that an action system can take; integrative, expressive, conservative, and adaptive. A smallest space analysis was performed on 46 variables describing 230 cases of arson and the results identified the four themes of action system functioning. An examination of the personal characteristics of the arsonists also produced four variable groupings and a combined analysis of the four action scales and four characteristics scales also supported the structural hypothesis of the action system model. The second study applied the action system model to the study acts of terrorist barricade-hostage incidents. A smallest space analysis of 44 variables coded from 41 incidents again revealed four distinct forms of activity, which were psychologically similar to the four modes of arson identified in study one. Overall, these two studies provide support for the appropriateness of the action system framework as a way of classifying different forms of deviant behaviour. Copyright © 2001 John Wiley & Sons, Ltd.**

### INTRODUCTION

It has been argued that the foundation of a theory of crime is the construction of an appropriate classification system to account for variations in both different ways of committing the offence and types of offender (Blackburn, 1993). A number of such

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classification systems have been proposed to describe various forms of criminal activity, particularly in relation to sexual offences (see, e.g., Canter & Heritage, 1990; Groth, 1979; Knight & Prentky, 1987) but also for 'less serious' offences such as burglary (Merry & Harsent, 2000; Rengert & Wasilchik, 1985) and arson (Canter & Fritzon, 1998; Harris & Rice, 1996). However, as yet there has been no attempt to describe a unitary framework with a scope broad enough to encompass a wide range of criminal or indeed non-criminal behaviour. The implications of such a system of classification are wide; given that few criminals commit crimes of only one type, such a framework could be used to link various offences to a single individual. It also goes one step further towards understanding criminal behaviour and the various underlying processes that give rise to it. This understanding could be used in various therapeutic and preventative contexts, as well as being helpful to law enforcement officials.

The aim of this paper is to suggest a possibility for a unitary framework using two very different crime types as illustrations; arson and terrorist barricade–hostage incidents. These have been chosen because they encompass various aspects of criminal behaviour and a wide range of motivations. Although arson is usually regarded as a property crime, it can also be seen as an offence against the person because the motive is often revenge (Barnett, 1992; Lewis & Yarnell, 1951). Acts of terrorism are perpetrated for various reasons including psychological and/or political motives. It is therefore argued that a general model found to be applicable in these two cases could also be broadly applicable to other crime types.

In the social sciences generally, attempts to establish scientific lawfulness regarding human behaviour have often failed to establish either a conceptual framework to guide empirical observations or a method of analysis which corresponds with that framework (Shye, 1985). The action system framework coupled with multivariate data analysis represents one possibility. Based on a general system approach (von Bertalanffy, 1968) and developed by Talcot Parsons (1953), the action system model as applied to human behaviour has a number of key components, outlined by Shye (1985). He defines a system as a collection of members that maintain interrelationships among themselves. To the extent that such a system is *active, open, organized, and stable*, it can be regarded as an action system (Shye, 1985).

Although there have been some interesting proposals about human action systems, no studies have been published that consider their implications for destructive forms of behaviour and ways of understanding this behaviour at the level of individual criminals. In general, Shye's work has been concerned with effective system functioning, or 'well designed' action systems. The destructive behaviour of criminals can be seen as modes of dysfunctioning, in other words 'badly designed' or deviant action systems. However, parallel processes between functional and dysfunctional action systems can be hypothesized. All forms of criminal activity are 'active' and 'open' to the extent that they involve a transaction with either another individual or physical surroundings. They are 'organized' in the sense that there are different aspects to the criminal activity that interact with each other to produce an end result, and they are 'stable' in so far as the behaviour evolves out of existing and continuing processes within the individual and his/her surroundings.

Shye (1985) points out that in order to model all action systems which are open it is necessary to consider (a) the sources of the action and (b) the effect or desired

Table 1. Summary of Action System Modes of Functioning

|          |          |              |
|----------|----------|--------------|
| External | External | Adaptive     |
| Internal | External | Expressive   |
| Internal | Internal | Integrative  |
| External | Internal | Conservative |

target of the action. Both these aspects of the action system can be located internally or externally. Thus the source can be within or outside the acting agent, in this case the criminal. The impact or target can be within the environment or the individual. In the case of arsonists, for example, this leads to the proposal that the dominant goal is either to change the state of feeling and experience of the firesetter him/herself or to modify some external state of the world.

Shye (1985) has illustrated in a number of studies that the combination of (a) the internal and external sources of action with (b) agent or environment as the targets of the action gives rise to four basic modes of functioning of action systems that Shye labels *adaptive*, *expressive*, *integrative*, and *conservative*. The four modes of acting, derived from their two primary facets, can be summarized as in Table 1.

These can be seen as providing hypotheses for distinguishable forms of criminal activity.

*Adaptive mode.* Functioning in this mode, the action system responds to external events in the environment by making adjustments to that environment. This involves adaptation and exploitation, and so there is some overt purpose or instrumental gain sought in the action that is, in effect, a reaction to an aspect of the context the individual is in. In the case of arson, then, crimes committed within this mode of action are expected to be opportunistic with the selection of actual target being less important than the desire to modify it. For example, a burglar who sets fire to cover up evidence of his theft could be seen as an adaptive arsonist. Because of the nature of terrorism, the adaptive mode is hypothesized to be the most successful mode of functioning in this context. This will be discussed further in Study 2.

*Expressive mode.* The dominant style of operation here is the demonstration of internal psychological aspects of the agent on the external world. According to Shye (1985) this is the way in which the system “exercises its power and influence on its surroundings [by trying to create] a reality which reflects in one way or another the system’s own characteristics” (p. 102). In the context of criminal behaviour, this mode of functioning would be expected to describe the behaviour of, for example, certain sorts of sadistic sexual killer in which elaborate pre-offence fantasies are regarded as playing a dominant role in the way that victims are killed (Ressler, Burgess, Douglas, Hartman, & D’Agostino, 1986). In the context of arson this may be reflected in the selection of targets with some symbolic, emotional significance.

*Integrative mode.* This is the mode that describes adjustments that take place within the system itself. In the context of human action systems, a trivial example might involve individuals trying to ‘cheer themselves up’ by engaging in an activity that they enjoy. This is distinct from the expressive mode in that the impact of the action is primarily internal, rather than necessarily having an observable external effect. It is possible to see how this type of psychological

integrativity might become more pathological in individuals with some level of emotional disturbance. Such individuals might, for example, engage in attention-seeking activities that could endanger both their own lives and the lives of others.

*Conservative mode.* Shye describes this as ‘events [that] constitute a fundamental aspect of [the system’s] identity’ and gives as examples the adoption of a constitution by an American state, or perpetuation of religious beliefs. Broadly, these involve events that originate externally and are internally assimilated by the system. In the context of criminal behaviour, however, it may be more appropriate to adopt a slightly broader definition of acts that involve the conservative mode of functioning. For example, criminal acts such as arson perpetrated out of a desire for personal revenge may be seen as the individual responding to an external source of frustration that s/he wishes to hurt or remove. This would be seen as conservative, particularly where the retaliation was directed at someone with whom there was a close personal relationship, so that the act would be directed at redressing the individual’s own state of emotional well-being.

These modes, then, provide a hypothesis of the major variations that will distinguish between different action systems. Any system under study, in our case arsonists and terrorists, will thus be expected to operate in a way that indicates a dominant theme to their activities that accords with one of the hypothesized modes.

### **Relationships Among Modes of Functioning**

In considering the four modes of acting Shye (1985) argues that they have logical similarities and differences from each other. Thus adaptivity with its emphasis on adjustments outside of the system is most distinct from integrativity with its focus on internal adjustments. Conservativity is distinct from expressivity in terms of the direction of actions, the former being an internalization of external factors and the latter being an acting out of internal processes. These considerations of the logical relationships between the modes of action can be represented geometrically as shown in Figure 1.

In summary, Figure 1 proposes that because the conservativity and expressivity modes constitute two polar ends in the functioning of an action system, they are expected to be at opposite ends of the diagrammatic representation. Adaptivity is derivable from these two extremities and therefore maintains an affinity with both of them, and the same is true of integrativity. Although these are also distinct from each other (the former concerning external adjustments and the latter internal adjustments) they are not as distant from each other as are the poles of conservativity and expressivity.

The action system framework therefore provides a number of specific hypotheses for the consideration of criminal behaviour. One set of hypotheses is that the four modes of acting will be distinguishable in an analysis of criminal activities. A second hypothesis is that the relative similarities and differences between these modes will take the form illustrated in Figure 1. These are the fundamental criteria that must be fulfilled if the argument that criminal activity can be described by this framework is to be supported. An additional hypothesis, however, is that individuals who operate

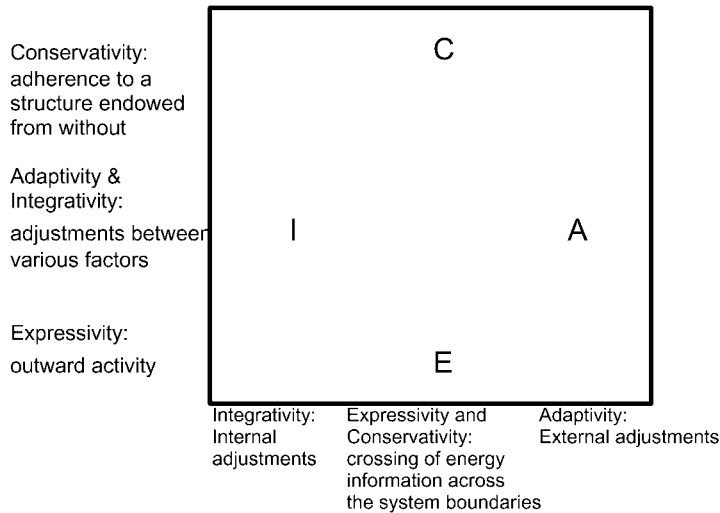


Figure 1. The conceptual interrelationships among the functioning modes of an action system, represented by means of geometric-spatial proximities.

in the different modes will have appropriately distinct personal characteristics. This hypothesis is only testable if one has access to the characteristics of offenders. In the present case this access was only available in the data on arson. This is therefore the first study that will be described.

## STUDY 1: ARSON

The hypothesis of four modes of arson is supported by previous literature on classifications of arsonists. For example, Harris and Rice (1996) also identified four categories, described as 'psychotics', 'unassertives', 'multi-firesetters', and 'criminals'. Parallels can be seen between these four groups and the modes of action system functioning as described above. For example, the 'psychotics' may be seen as integrative in the action systems sense since these are both focused on internal processes and emotional disturbances. The 'unassertives' can be likened to the conservative mode of functioning, in that these individuals react to external frustrations by lighting fires, rather than dealing with them more directly. The 'multi-firesetters' may be seen as an extreme form of the expressive mode in that emotional relief is obtained from setting fires. Finally, the 'criminals' are essentially adaptive in that their firesetting is used as a way of covering up other crimes that have been committed. However, unlike the four modes of functioning, the categories identified by Harris and Rice did not contain any clear description of the underlying process of arson that they refer to. Unfortunately, the study failed to find corresponding sub-groups for the characteristics of the fires themselves. The attempt to find patterns in the features of the fires may have been thwarted by a lack of theoretical framework to guide this process. Similarly, the sub-groups were derived in an *ad hoc* fashion without clear empirical definitions of what each category represented. The labels themselves reflected concepts from a number of different

domains, for example, psychiatry and personality psychology. It was not clear why 'psychotics', for example, could not also be 'multi-firesetters', since one refers to a mental state and the other to a behaviour. In the current study the adoption of the action system approach to guide hypotheses about the way that firesetting actions and characteristics will differentiate is expected to strengthen the associations found.

More recently, work by Canter and Fritzon (1998) developed a model of firesetting that has some very direct parallels with the action system framework. This model classified arson according to its target and the motivational category underlying the act. The targets were differentiated in terms of whether they were objects (e.g., business premises, schools, institutions) or specific people who were significant to the arsonist. The motivational distinction was in terms of whether an obvious instrumental outcome was desired (e.g., revenge or crime concealment) or whether the act was expressive in terms of drawing attention to some underlying emotional distress.

This model, therefore, takes into account both the source (instrumental or expressive) and focus (person or object) of firesetting in the same way that the action system framework does and therefore provides an appropriate methodological model for the current study.

What the action system framework adds to these, and other, existing classifications of arsonists is a way in which the behaviour *and* characteristics of arsonists can be understood within one unified model as reflecting an individual's characteristic way of functioning in the world. In the same way that the model of Canter and Fritzon (1998) showed that prior, seemingly contradictory, classifications could be understood as referring to different *forms* of arson, the present study argues that the action system framework describes different forms of behaviour, of which arson is just one example.

The hypotheses of differentiating modes of a schematic action system have a number of implications that are open to direct test with the relevant data. If all the actions that can and do occur in malicious fire setting are considered it is hypothesized that the different emphases highlighted by the action system modes will be apparent in the co-occurrence of some actions and not others. The hypotheses can be tested by considering whether the variety of actions that co-occur demonstrate the action system modes.

## Procedure

The first stage in the procedure was to identify which crime scene related actions could be used to differentiate the offences. As with the study by Canter and Fritzon (1998), this was achieved by examining police records of solved crimes; a methodology that is still relatively rare in England. Details of 230 arson cases were obtained from a number of police forces across England. The cases were all ones where the offender(s) was known and had been dealt with by the courts. In addition to the 42 variables used by Canter and Fritzon (1998) a further four variables were added to reflect different aspects of the four modes of action system. These were 'other crime', 'finance', 'crusade', and 'outburst'. The first two of these relate to the adaptive mode of functioning where the firesetting behaviour arises from environmental opportunities and may be used as a way of covering up other illegal activity,

or obtaining some direct financial gain from the fire. The variable 'crusade' relates to the expressive mode where the drive to set fires comes from within the individual and may be used as a way of achieving recognition. Finally, 'outburst' describes an excessive/explosive reaction to some external frustration, which would be indicative of the conservative mode of functioning. A full list and explanation of the 46 variables is provided in Appendix A.

The central task of the analysis was to identify themes relating to the hypothesized action system structure within the co-occurrence of the actions across all the cases. This involves examining the relationships existing between all 46 offence variables across the 230 cases. A data matrix was produced by coding the offences in terms of the presence (1) or absence (0) of each of the variables. The data was then subjected to a multivariate analysis in the form of a multi-dimensional scaling procedure, smallest space analysis (SSA I), which tests the relationship each variable has to every other variable. This is achieved by producing an association matrix, in this case using a Jaccard coefficient of association that 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 and other secondary data sources 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 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. This methodology is now widely used in studies of personality and emotions as reflected in the book by Plutchik and Conte (1997). Technical accounts can be found in the work Lingoes (1973) or, more recently, Shye, Elizur, and Hoffman (1994).

## RESULTS

### *SSA of Offence Behaviour*

A three-dimensional SSA solution had a Guttman-Lingoes coefficient of alienation of 0.18 in 10 iterations. This coefficient is a measure of how well the analysis has managed to 'fit' the spatial representation of all the inter-relationships among variables into the three-dimensional space. A perfect fit would be denoted by zero, but in practice a figure of less than .20 is regarded as acceptable (Donald, 1995). Figure 2 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. The closer together any two variables are in Figure 2 the more likely when one occurs in an offence that the other will also occur. Therefore, for example, the proximity of the variables 'multiple offender' and 'miscellaneous' on the SSA shows that an arson that is committed by multiple offenders is often targeted at miscellaneous properties. By contrast, however, in these cases it is unlikely that a suicide note will be left at the scene.



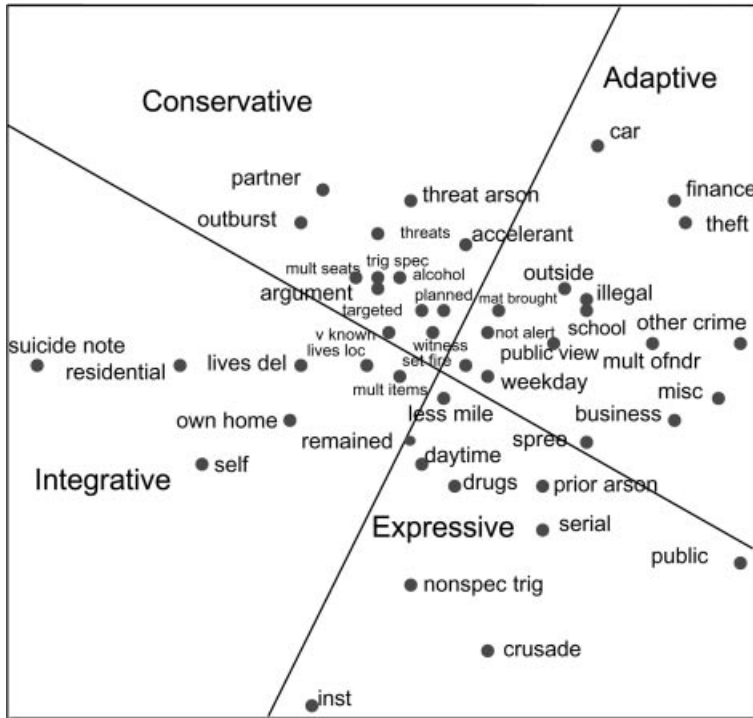


Figure 3. SSA showing action system themes in arson actions.

where the actual target is less important than the desire to modify it. This can result in arsons that are essentially forms of vandalism, or in attempts to cover up another crime such as car theft or burglary. The variables that make up this form of arson are found on the right-hand side of Figure 3: business, car, finance, illegal entry, material brought, miscellaneous property, multiple offenders, not alert, other crime, outside, public view, school, spree, and theft. Together, these variables suggest that the act of firesetting arose from opportunities presenting themselves during other illegal activities. For example, the variable 'school' is close to 'illegal entry' and 'multiple offenders', suggesting that a fire was set as part of the activity of breaking into schools and vandalizing them. Similarly, 'car' is relatively close to 'finance' and 'theft', suggesting that the reason for setting fire to cars is to cover up evidence of their theft. These are both adaptive in the sense of having both external sources and targets for the action. The fact that these crimes also take place outside and in public view suggests that the arsonists are not concerned about taking steps to avoid detection; this again reinforces the spontaneous, unplanned, and opportunistic nature of these offences.

The items in the adaptive region form a reliable scale, having a Cronbach  $\alpha$  of .62.

*Expressive Mode.* According to the action system framework, expressive behaviour involves an external manifestation of internal processes and drives. This accords

with Geller's (1992) emphasis on arson that is a means of emotional acting out. The internal source of the firesetting, coupled with an external target, suggests that this form of arson is likely to involve properties which the individual is able to derive vicarious attention from burning, such as hospitals and other large public buildings. They are chosen to provide the most effective means of achieving the arsonist's objective. This can often result in serial firesetting as the consequences of the fire provide the individual with reinforcement for his behaviour in the form of vicarious attention. The internal source of the firesetting can be either a pathological fascination for fire, or some other psychological state, which may have resulted from an emotion-evoking trigger. At its most extreme it could probably be seen to encompass pyromania (Geller, 1992).

The expressive variables are found at the bottom of Figure 3: crusade, drug use, institution, non-specific trigger, prior arson, public building, remained, and serial. These items have a Cronbach's  $\alpha$  of .62.

*Integrative Mode.* Within the arson offences, there was a sub-group of cases where the individual either set fire to him/herself, or to objects placed around, in what would appear to be an act of suicide. These cases are found on the left-hand side of Figure 3 and are represented by the variables self, suicide note, own home, residential, multiple items, remained, lives endangered by location, and lives endangered deliberately. The reliability of this scale is higher than the previous two, having a Cronbach  $\alpha$  of .72.

This set of variables can be seen as reflecting the integrative mode of functioning in that internal distress results in an act of firesetting which is also directed internally, at the arsonist themselves. Therefore, as hypothesized, this mode of functioning, when applied to destructive criminal behaviour, is arguably the most serious in terms of consequences, as shown by the variables 'lives endangered by location' and 'lives endangered deliberately'. In one of the examples in Shye's paper, concerning a study on quality of life, this mode of functioning was described as promoting internal harmony. In the context of arson, the integrative mode of functioning represents *dis*-harmony within the individual, resulting in arson behaviour that may be an attempt to restore equilibrium, or alleviate distress by seeking attention from family or Authorities.

*Conservative Mode.* This is the manner in which the system relates to events that emerge outside the system and have an effect inside. In terms of arson behaviour these cases often arise following an event, or series of events, involving another person, which result in the arsonist feeling the need to take revenge for a real or imagined wrong-doing. Thus the source of the action is external, and the effect is to redress the emotional response provoked by this triggering event. The variables representing this conservative form of firesetting are found at the top of Figure 3 and are partner, outburst, threat of arson, threats, accelerant, trigger specific, multiple seats, alcohol, argument, planned, targeted, victim known, witness. These items have the highest reliability of the four themes, with a Cronbach's  $\alpha$  of .83.

The restorative function of this form of firesetting is shown by the variables 'outburst', 'accelerant', 'multiple seats', and 'witness'—suggesting that the individual is highly enraged and acts in order to destroy the source of this rage, who is often a partner, or ex-partner. The variable 'witness' indicates that, by setting fire in

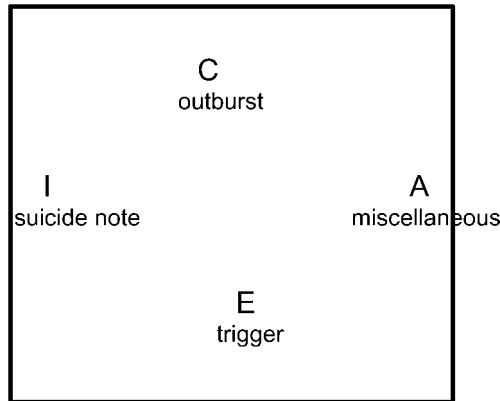


Figure 4. The spatial relationships among the functioning modes of arsonists.

front of the protagonist, the arsonist obtains further emotional relief by making a direct impact on that person.

*Relationships Among Regions.* Further support for the correspondence between the themes of arson and modes of functioning outlined above comes from the positioning of the regions of the SSA. Figure 4 shows the basic structure of the arson SSA. The positioning of the four regions is indicated with the 'core' variable that helps to define that region most precisely. The relative position of these variables and the regions they represent corresponds to that which was hypothesized by the relative similarity and differences of the four modes, based on their definitional constituents.

The expressive mode (represented by the variable 'trigger') is located opposite the conservative mode ('outburst'), and the integrative ('suicide note') opposite the adaptive ('miscellaneous'). This is the pattern expected by Shye's contiguity hypothesis.

*Offender Characteristics.* The third hypothesis for the action systems model is that individuals who commit crimes according to a particular mode of functioning 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 crime is a reflection of the characteristics of the criminal. 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 relation to the present study, this hypothesis has two parts. The first is that an analysis of the personal characteristics of arsonists will reveal four distinct themes that relate to the action systems framework, and the second is that each of these four background themes will have corresponding relationships with the four styles of firesetting identified previously.

In order to test for the existence of four sub-sets of arsonists, 25 variables were derived from a content analysis of the background characteristics of the 230 arsonists. These variables relate to various aspects of the personal histories and circumstances of the offenders involved, and include characteristics that reflect the four modes of functioning. These variables are also listed in Appendix A.

The *integrative* mode, in which internal processes are dominant, would be expected to be typical of people with psychological problems, as discussed earlier. By contrast the *adaptive* mode, in which the arsonists' use of fire is more opportunistic, as part of a repertoire of criminal activities, would be expected of people of a more immature, impulsive nature perhaps with a history of minor delinquent behaviour. The *conservative* mode has elements in common with both of the previous modes, being externally generated and focused on changing an internal state, but this form of firesetting is expected to occur primarily in the context of personal relationships. The functionally opposite mode of arson is the *expressive* mode in which internal drives are acted out on the environment. As previously discussed an arsonist who sets fires according to this mode may receive reinforcement for their behaviour and therefore a history of fire related activities is expected in the backgrounds of such individuals.

### SSA of Offender Characteristics

In order to test the hypothesis that the four modes of action system functioning would also be reflected in the background characteristics of the arsonists, a second smallest space analysis was run on the 25 background variables.

The three-dimensional solution has a Guttman–Lingoes coefficient of alienation of 0.20 in six iterations, indicating a good fit. Figure 5 shows the one- by two-dimension projection.

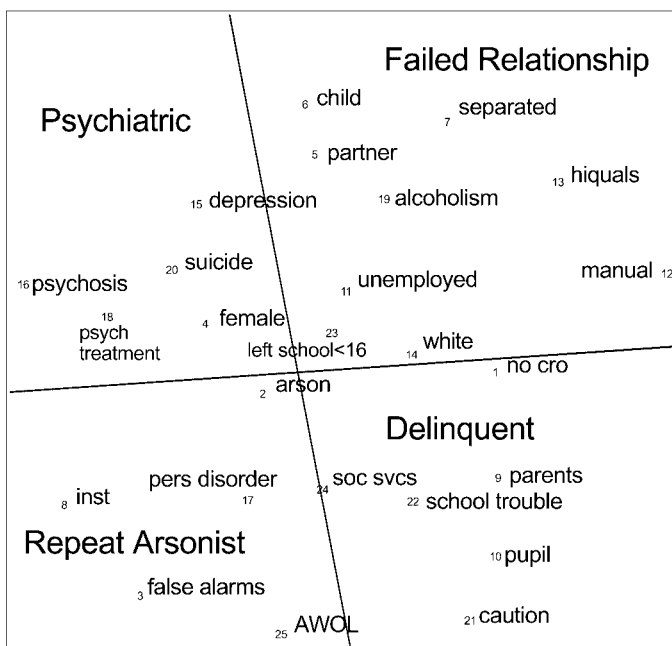


Figure 5. Themes in firesetters' characteristics.

## Discussion

### *Themes in Firesetters Characteristics*

*Adaptive: Delinquent.* As expected there is a set of characteristics that reflect the criminal or deviant lifestyle of those offenders that reflect the adaptive mode of functioning. These tended to be younger offenders of school age (mean = 17 years) who are living with their parent(s). The variables used to define this region are thus police caution, living with parents, school pupil, school trouble, social services. These items give a Cronbach  $\alpha$  of .73.

*Expressive: Repeat Arsonist.* The expressive theme describes the person for whom setting fires is a significant aspect of their way of life. This is particularly notable in the variable 'awol', which refers to an individual 'going missing' from routine daily activities such as work or school in order to set fires. The internal processes that generate this mode of functioning are reflected in the variables institution, personality disorder, and social services, which are all indicative of the sorts of emotional and social problems such individuals experience.

The following characteristics form this region: awol, false alarm calls, institution, personality disorder, prior arson, social services. These variables gave a Cronbach  $\alpha$  of .54.

*Integrative: Psychiatric History.* As with the expressive characteristics, internal psychological processes and problems are the primary drive for this sub-group of arsonists. Therefore, this region in the SSA contains the majority of the variables relating to such disturbances: depression, suicide attempts or threats, psychosis, and psychiatric treatment. These are all reflective of greater levels of emotional and psychological disorder than in the previous group. Thus, the behaviour of integrative individuals is focused internally and aimed at restoring these psychological disturbances more directly. These four variables, together with the arsonist being female, give a Cronbach  $\alpha$  of .70.

*Conservative: Failed Relationship.* This group of arsonists are the individuals for whom the predominant characteristics relate to personal relationships, and problems in those relationships. These problems constitute the external triggers for the conservative form of firesetting. It is also interesting to note the associations with unemployment or unskilled employment together with high qualifications in this region of the SSA. In other words, it seems that despite a reasonable academic record, these individuals have not been successful in gaining skilled employment. In the literature on domestic violence, resource theory (see, e.g., Goode, 1971) suggests that men are more likely to use violence as a form of personal force if they have fewer other resources, for example, poor social skills, lack of employment. Therefore, as suggested by Pettitway (1987), arson may be used as a form of aggression by individuals who feel they lack the resources for direct physical confrontation. The variables in the conservative region are alcoholism, child, partner, higher qualifications, separated, manual, unemployed. These variables

Table 2. Spearman's  $\rho$  of Actions and Characteristics Scale

| Actions      | Integrative        | Adaptive           | Conservative       | Expressive         |
|--------------|--------------------|--------------------|--------------------|--------------------|
| Integrative  | .39<br>$p < .001$  | -.28<br>$p < .001$ | .36<br>$p < .001$  | .10<br>n.s.        |
| Adaptive     | -.39<br>$p < .001$ | .40<br>$p < .001$  | -.32<br>$p < .001$ | .00<br>n.s.        |
| Conservative | -.01<br>n.s.       | -.52<br>$p < .001$ | .54<br>$p < .001$  | -.25<br>$p < .001$ |
| Expressive   | .39<br>$p < .001$  | -.09<br>n.s.       | .00<br>n.s.        | .53<br>$p < .001$  |

have a Cronbach  $\alpha$  of .53, which is lower than the others due to the negative correlations between 'partner', and 'separated/divorced'.

### *Associations Between Actions and Characteristics*

Testing the hypothesis of correspondence between modes of arson action and the appropriate characteristics of the arsonist involved correlating the individual scores on each of the two sets of four scales. These were calculated using Spearman's  $\rho$ , which is based on the relationships between each of the action scores and each of the characteristics scores. For example, if as the scores for conservative characteristics increases so do the scores for actions, then there will be a high correlation between conservative actions and characteristics. These correlations are presented in Table 2.

This table shows that all of the corresponding action and characteristic modes of functioning correlate at the  $p < 0.001$  level. The adaptive actions correlation with the adaptive characteristics is .40. For the integrative mode the correlation is .39. The expressive actions and characteristics correlate at .53 and the conservative at .54. The antithetical relationships, in which the modes are hypothesized to be in opposition to each other, adaptive versus integrative and conservative versus expressive, also all have negative correlations; all of these are significant at  $p < .001$  except for the expressive actions with conservative characteristics, which has a zero correlation.

It is important to note that Table 1 only reflects the correlations between arson actions and characteristics. However, action system theory implies that there are relationships both within and between the actions and characteristics that reflect the modes of functioning. The structure of all these inter-relationships can be modelled as shown in Figure 6.

This diamond model, however, does not reflect the relationship that every scale has to every other; merely the key correlations indicated in Table 1. It is really most appropriate to see Figure 6 as a very specific set of structural hypotheses, in effect predicting the anticipated relationships that would be revealed in a two-dimensional SSA of these eight measures. Figure 7 shows the SSA plot that resulted from entering the 28 Spearman inter-correlations among the eight scales. This plot has a coefficient of alienation of .09 in five iterations, indicating a very good fit between the system of associations and the resulting representation.

Overall, then, this system of correlations between actions and characteristics provides strong support for the action system hypotheses in that the modes of

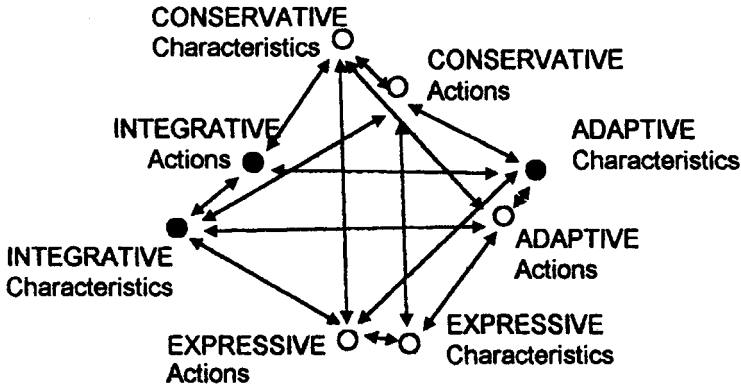


Figure 6. Hypothesized structure of relationships between arsonists' actions and characteristics.

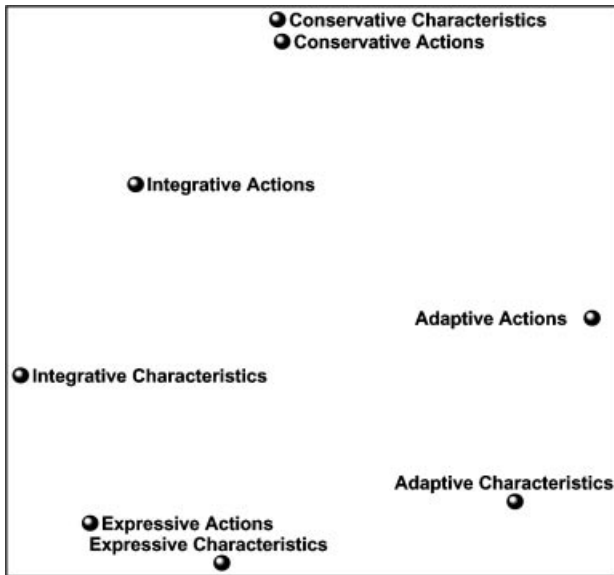


Figure 7. SSA of actions and characteristics.

functioning revealed in the acts of arson do have the expected correlations with the appropriate characteristics of the arsonists. Furthermore, concerning the relationships among the modes of functioning, Shye (1985, p. 112) argues that ‘the polarization between conservativity and expressivity [is] the fundamental phenomena’ and that adaptivity and integrativity maintain an affinity with both of them. This can be seen very clearly in Figure 7 in the way that the integrative and adaptive actions and characteristics gravitate towards the central region, whilst the expressive and conservative actions and characteristics are further apart.

To test whether the action system hypothesis could be extended to other areas of criminal activity, an analysis of terrorist barricade–hostage incidents was carried out.

## STUDY TWO: TERRORIST BARRICADE-HOSTAGE INCIDENTS

The scope of this study was narrower than the previous one because the quantity of data that was available was much smaller. Having examined in detail a number of action system hypotheses in relation to arson, this study is simply an exploration of the applicability of the same framework to a very different crime. The aim is to highlight the fundamental similarities in the two models rather than to present a very detailed analysis of terrorism *per se*. Nevertheless, as with the work on arson, distinctions can be drawn between the present classification system and existing models of terrorist activity. Previous work on hostage-taking has tended to focus either on specific event factors such as the outcome of the siege or negotiation success (see, e.g., Friedland & Merari, 1992; Sandler & Scott, 1987), or on the nature of the terrorist personality and motivations (see, e.g., Ferracuti & Bruno, 1981; McClean, 1986). Most motivational typologies of terrorist incidents suffer the same lack of theoretical and empirical basis as those of arsonists (see, e.g., Harris & Rice, 1996) and, again, contain overlapping categories (see Crighton, 1991, for a discussion). Hence, there is little existing literature that can assist in an understanding of the hostage-taking events themselves, encompassing both dynamic and static factors relating to initiation, duration, and outcome processes. The results from the previous study on arson suggest that the action system framework may represent one such possibility. Additionally, the results from the present study could be used to derive hypotheses about the nature of the terrorist groups themselves, thus allowing for a way in which all the components of the hostage-taking act could be seen as representative of the approach that the group typically takes in its interactions with outside agents.

This study analysed data on barricade-hostage incidents; these are acts perpetrated by terrorists involving the seizure of one or more hostages and where there is no attempt to leave the original scene of the crime. Authority actions and negotiations are carried out with the perpetrators effectively also as hostages, unable to leave the scene at their time of choosing (Mickolus, 1980). Hermann and Hermann (1998) note that hostage taking has been called 'smart' terrorism, since terrorists are able to maintain control over the situation and force authorities into the weaker position in the course of any negotiations. In this sense, they suggest that the terrorists hold the upper hand in the battle for control of the situation. However, it is argued here that barricade-hostage incidents may involve varying degrees of control on the part of both the authorities and the terrorists.

The nature of gaining control of barricade-hostage situations depends on the interrelationship between authority and terrorists. It is this interaction that is the focus of this study, in which it is hypothesized that the four modes of action system functioning will be reflected in different forms of interaction between these two agents.

### Adaptive Mode

In contrast to the study on arson, in which the adaptive mode of functioning was seen as an essentially opportunistic, unplanned event, in the context of terrorism

adaptivity is most likely to lead to a successful outcome and is therefore arguably the most sophisticated form of activity. As Shye (1985, p. 107) states, 'negotiations are more successful inasmuch as they include mutual adjustments based on complementation and mutual compensations.' This statement is very applicable to a description of negotiations between terrorists and authorities. It is therefore expected that this mode of functioning will be reflected in incidents involving mutual concessions by both terrorists and authorities, a willingness to communicate on both parts, and in the eventual safe release of hostages.

### **Expressive Mode**

In this mode of functioning the system is acting out internal forces and pressures. In the context of terrorism, this is not conducive to an effective interaction with external agents; all communication is being directed outward and there is very little activity in the opposite direction. These types of incident, therefore, are not likely to lead to a successfully negotiated outcome, and are in fact most likely to be concluded by an action on the part of the terrorists themselves.

### **Integrative Mode**

As was described previously, the integrative mode of functioning is the most disturbed in relation to destructive and interpersonal forms of criminal activity. It suggests an individual whose actions are compelled by psychological disturbances and where the desired outcome is to effect a change in emotional state. In the context of this particular form of terrorism, therefore, these barricade-hostage incidents are likely to be committed by lone perpetrators who are psychologically disturbed, as opposed to having political objectives for their action. This disturbance is likely to cause them to behave erratically and irrationally and therefore is the most likely of the four to result in a violent outcome.

### **Conservative Mode**

In this mode of functioning the more active party in any interaction with the terrorist(s) is external, that is, the authorities or even the hostages themselves. This type of incident is therefore most likely to be resolved through some action by the authorities, with the terrorists playing a minimal role in negotiations. Terrorists who are operating in this mode are also likely to have objectives that relate to their own internal systems of beliefs and values. The terrorist act is therefore likely to be motivated by political or other ideological objectives.

### **Procedure**

The material used for this study came from the book *Transnational Terrorism: A Chronology of Events, 1968–1979* (Mickolus, 1980). A total of 56 barricade-hostage

incidents were reported. The details were taken from multiple sources including international news agencies.

Fifteen incidents were excluded from analysis. The reasons for exclusion included that there was an insufficient amount of detail available, the incident's result was not reported, or that the incident was still ongoing at the time of publication.

The 41 remaining barricade–hostage incidents were content analysed to produce 44 variables (see Appendix B for a full list of variables and their description) relating to seven stages that may occur in a barricade–hostage situation: location, terrorist entry variables, terrorist seizing of hostages, terrorist issue of demands/threats, terrorist–authority negotiation, authority forceful intervention, and the outcome of the incident by safe release of all hostages. This is a much more exhaustive list of variables than that contained in previous studies, with the exception of recent research by Wilson and Colleagues (e.g. Wilson, 2000). As with the previous study, the cases were coded dichotomously and the data matrix subjected to a smallest space analysis. This is presented in Figure 8, with a coefficient of alienation .19 in 32 iterations.

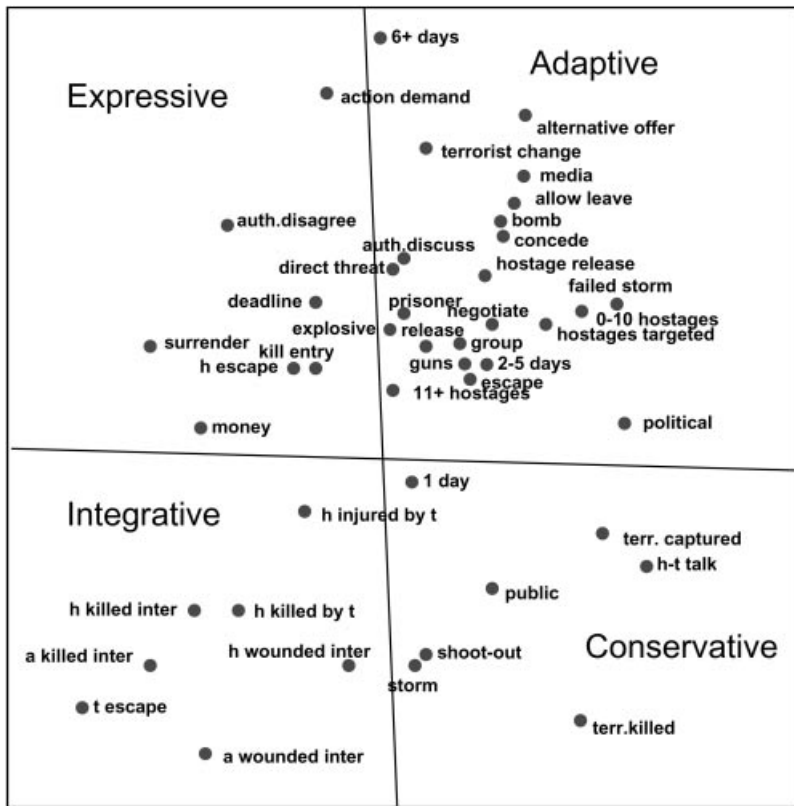


Figure 8. SSA of barricade–hostage terrorist incidents.

## Results

### *Adaptive Mode*

As hypothesized, this is the region of the SSA that contains all the variables relating to negotiations, discussions, and concessions between the terrorists and authorities. From the point of view of the terrorists' actions, this is arguably the most sophisticated form of incident. The number of hostages that are taken and threats of weapons ensure that the authorities regard them seriously, and the long duration of the incident is reflective of the complex negotiation processes involved.

The presence of the specifically targeted hostages variable in this area can be considered indicative of high terrorist organization, and the presence of terrorist goals. From both sides, the conclusion of the incident is satisfactory in that hostages are released safely and the terrorists are allowed to leave the country. Crenshaw (2000) also points out that the sequential release of hostages can be used as a strategy to gain credibility with the authority, encouraging them to concede to the terrorists' demands.

### *Expressive Mode*

The variables in this region are action demand, deadline, authorities disagree, hostages escape, kill entry, money and surrender. Additionally, the variables direct threat and explosives are on the border between this region and the adaptive, indicating that they may be present in either form of incident. This is one of the strengths of a thematic interpretation of data; variables are not assigned to rigid 'types' (as would be the case with a factor analytic model, for example) but can take on different interpretations depending on the overall pattern of associations among all the variables. Borderline variables are useful because they allow for the common-sense recognition that people who operate in different modes of functioning may actually have a few individual behaviours in common. The dominant underlying process, however, can be understood by examining the other actions present in the overall pattern of behaviour.

The majority of these variables indicate that the interaction between terrorists and authorities consists mainly of actions performed by the former party. In other words, the terrorists make various demands and issue various threats, but are not open to communications in the opposite direction. As can be seen, this results in the outcome of the terrorists surrendering (presumably also an action precipitated by them). If the authorities seek surrender, the SSA would suggest that there is little they can actively do. Surrender appears to be more dependent on the failure of the terrorists to establish control. The somewhat chaotic nature and lack of control exerted by the terrorists in this form of incident is suggested by the fact that hostages are able to escape, and also that international authorities disagree on what action to take.

### *Integrative Mode*

This type of incident is characterized by a highly destructive outcome in which both authorities and hostages are killed and/or injured. It is interesting to note that, unlike

the integrative mode of functioning in arson, this form of terrorist incident did not involve injury or death to the terrorist(s) himself/herself (themselves). In fact, the variable 'terrorists killed' was located in the Conservative region of the SSA. It may be that the desired outcome of this form of incident is simply to draw attention to the individual who achieves a sense of power, rather than to be self-destructive. In such incidents where no specific threat is made and there is no demand, then this is likely to promote an image of random intentions on the part of the terrorists rather than that they wish to engage in bargaining. The precipitative action of killing or injuring hostages prompts authorities to intervene, and during this intervention, more hostages as well as authority agents themselves are killed.

### *Conservative Mode*

This is the mode of functioning in which the authorities have the upper hand in terms of control over the interaction, in that there are very few variables that indicate actions taken by the terrorists. Aside from choosing a public building as a location for the barricade–siege, the terrorists do not appear to make any demands or indicate their purpose for acting. Authorities very quickly take charge of the situation by storming the building and terrorists are killed and/or captured during the ensuing shoot-out. It is interesting to note that this is the region of the SSA that contains the variable 'hostages and terrorists talk'. It may be that these terrorists are aware of the possible benefits of 'Stockholm syndrome'—the tendency for interaction to lead to hostages feeling sympathy for the terrorists—or it could be that terrorists operating in this mode of functioning are simply more likely to respond to any external agent and therefore to submit to this kind of interaction.

### *Relationship between Regions*

As with the SSA of arson actions, the four terrorist modes are positioned correctly according to the contiguity hypothesis (Shye, 1985). In other words, the actions representing the adaptive mode of functioning are located opposite those reflecting the integrative mode; and expressive is opposite conservative.

In summary, therefore, this analysis has found support for the hypothesis that the actions of terrorists during hostage-taking incidents can be productively viewed as representative of one of the four modes of action system functioning. The advantage of this approach over previous terrorist typologies is that it provides a conceptual framework that encompasses many different components of the hostage incident, including interactions between terrorists and authorities as well as outcome measures. As was shown in relation to arson, this classification can also provide a basis for understanding perpetrator factors, in this case the nature of the terrorist group as a whole.

Together, these studies go some way towards suggesting an appropriate methodology for examining the structure and function of various forms of criminal and destructive behaviour, particularly those forms of behaviour in which there is a strong interactive component with either (an-) other individual(s) or the surrounding environment. These studies have both theoretical and practical implications.

## IMPLICATIONS OF STUDY 1 AND STUDY 2

### Implications of Study 1

In the first study, an action system model was found to be productive in modelling both the actions and characteristics of arsonists, and in providing a framework for examining the inter-relationships among those actions and characteristics.

This study has a number of direct implications for the treatment of arsonists. The identification of four main processes underlying firesetting behaviour suggests that different treatment programmes would be appropriate for each of these distinct sub-groups. This would rely firstly on the correct diagnosis of the arsonist around the action system framework, in relation to the function that the firesetting behaviour serves for the individual. Treatment would then be aimed at changing the arsonist's view either of themselves and their skills, or of their targets. In other words, if firesetting is used primarily as a means of communicating emotions, whether this be directed externally (expressive) or internally (integrative), the primary objective of treatment would be to learn more functional and less destructive ways of communicating these emotions.

A similar approach is required in relation to conservative arson, as this is also essentially a form of expressing strong feelings such as anger or jealousy. The crucial difference, however, is in the source of the emotion. In this case the event that triggers the firesetting comes from outside the arsonist, usually from a person with whom there is or has recently been a close personal relationship. Therefore, with conservative arson what needs to be addressed is the inappropriate and extreme reaction to these external sources of frustration.

Finally, the form of arson that is least emotional, being primarily concerned with changing aspects of the environment, is adaptive. Here what is needed in relation to treatment is a holistic approach aimed at changing the arsonist's inherent criminality and lack of respect for societal rules and conventions. Firesetting represents just one of a range of criminal tools and it is this tendency towards seeking out a variety of opportunities to commit crime that must be addressed in treatment.

The implications of this study also 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 value of implementing surveillance in areas recently subjected to arson attacks. It is also likely that offenders responsible for arsons to public properties, including institutions, will be known to police for previous firesetting. Another implication is that where an incident of arson shows evidence of planning and the use of accelerants, it is likely that it represents a targeted attack and that the victim will know the perpetrator.

There are also a number of implications of this study for the interviewing of suspects. In relation to integrative arson, it should prove fruitful to pursue lines of questioning centred on the emotional problems of the suspected arsonist. If these problems have proved overwhelming enough to prompt the individual to set fire to themselves, then it would be expected that they would show a willingness to talk to police officers on this subject. It is often this willingness to talk which represents the primary hurdle in investigative interviews, but by focusing on the central emotional

issues this may well draw the individual into a discussion about the—to them—peripheral issue of firesetting.

With expressive arson the desire for the arsonists is often to draw attention to themselves, possibly as heroic figures. Any deflection of this attention, therefore, may cause the arsonist to wish to emphasize his role in the firesetting. A skilled interviewer may be able to obtain a confession by, for example, suggesting that the suspect was not as instrumental in the ‘discovery’ of the fire as he would like to think.

Some forms of adaptive arson are committed in connection with other offences. It may therefore be harder to get individuals to admit a role in these fires as they will also be implicating themselves in those other crimes. On the other hand it may be possible to minimize the seriousness of the firesetting, or to have it taken into consideration (TIC) if the suspect confesses to the other offences.

Finally, the conservative arsons are often the result of an argument between the firesetter and an ex-partner. Although they represent an unreasonable reaction to provocation, interviewing officers may be able to indicate that they sympathize with the situation that led up to the arson, thus ‘normalizing’ the reaction and allowing the offender to admit responsibility.

These interview suggestions can also, of course, be seen as hypotheses for future study.

## **Implications of Study 2**

The second, briefer, examination of terrorist activity indicated that the action system model could be employed to explain variations in the interactions between terrorists and authorities. The practical implications of this are primarily in relation to projected negotiation outcomes of the various forms of terrorist barricade–hostage incidents.

It is not possible to pinpoint one single desired outcome for a barricade–hostage incident. Authority objectives for outcome will depend on each individual incident; for example, while extreme physical force may not generally be the optimal outcome, it may be necessary if terrorists begin to injure or kill hostages and if there are no other options available. Nevertheless, by understanding the function of acts of terrorism, it is possible to suggest ways in which authorities might influence particular outcomes.

Arguably, the most desirable outcome from the point of view of the authorities is the safe release of hostages. This is most likely to occur if the terrorists have an adaptive mode of functioning, and this is also the mode that is most open to negotiation. In terms of control over the situation, ultimately, the authorities must share control with the terrorists in the sense that closely related to the safe release of the hostages are the variables of authority concession and allowing the terrorists to leave the scene safely. The adaptive mode of functioning can therefore be described as a positive interaction involving shared control by the authority and terrorists, resulting in positive consequences for both sides (release of hostages bargained through allowed escape of terrorists).

On the other hand if the authority seeks the surrender of the terrorists, the results found in this study indicate that there is little they can actively do. Surrender appears to be more dependent on the failure of the terrorists to establish control, with only

one authority variable (disagreement between international authorities) associated with this expressive mode of functioning.

This, however, could be adapted into a positive strategy by the authority of inducing confusion within the terrorists by methods such as broadcasting false information that other members of the terrorist group have withdrawn their support for the attack. However, the variable of terrorists having injured or killed hostages is also associated with the expressive mode, and should be borne in mind when employing manipulative strategies. If terrorists have already injured or killed hostages, the threshold for further violence is likely to have been lowered.

The expressive mode of functioning therefore represents poor control exercised by both the authorities and terrorists. The only outcome variable within this area is the terrorists' surrender, which may appear to be positive in terms of authority goals, but does not appear to be a result of any actual authority action.

If authorities intend to forcibly capture terrorists, this appears to be the most common outcome of the conservative mode of functioning. However, this is also associated with shoot-outs and storming the building; evidently approaching armed terrorists involves great risks to all parties and should be conducted with caution. Instead, authorities may be able to take advantage of the terrorists' openness to incoming activity, by being more communicative and using less extreme methods of persuasion.

The integrative mode of functioning entails the most negative results by injuries and deaths to all sides involved in the barricade–hostage event. It points clearly to the negative consequences of authority control by forcible intervention, with the variables 'storm' and 'shoot-out' falling close to the border of this region with the conservative. This indicates that these actions on the part of authorities can occur in the context of incidents involving either mode of functioning but the implications vary. In the context of the integrative incidents, this action may result in injury to hostages, as well as to authority agents themselves. It is therefore imperative that the mode of functioning be accurately assessed before deciding on such drastic action; in one type of incident it can result in the successful capture of terrorists, but in another it has far more serious consequences.

Delicate negotiation is therefore suggested as the best method of control to use in order to minimize casualties and gain a peaceful resolution to the barricade–hostage incident. The analysis showed that the safe release of hostages is most likely when terrorist demands, terrorist threat, and negotiation are all present. This shows that authorities require knowledge of concrete terrorist goals in order to be able to negotiate most effectively.

If a missing threat is the only factor that makes the difference between successful and failed negotiation of the safe release of all the hostages, this needs to be addressed. Authority negotiations should be conducted in a similar way to when a direct threat has been made; confusion over terrorist intentions towards their hostages should not be allowed to cause confusion in the authority's response strategy.

The ability of negotiators to carefully elicit the terrorists' reasons for their attack, (without placing any ideas in the minds of the terrorists) may be of use in situations where the terrorist motives, intentions, and demands are unknown, such as with the integrative incidents.

Refusing to negotiate leaves the terrorists only two decisions; backing down through surrender or killing and injuring hostages to prove their serious intent in obtaining their goals. This incurs the risk of authorities being accused of allowing hostages to be killed rather than taking positive action to secure their release, and so is a potentially dangerous option.

## CONCLUSIONS

The identification of these four themes in arson and terrorist behaviour has a number of other implications for further study. The system model provides 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. For example, parallels can be seen in relation to particular targets and styles of homicide. Mothers who kill their children may be regarded as 'expressive' in the action system sense of communicating overwhelming emotions on a meaningful external target. Women who kill abusive husbands can be seen as 'adaptive' in that they are killing to survive. Other forms of intrafamilial homicide, such as husbands who kill their wives, may be seen as 'conservative' in the sense that the murder is precipitated by an external source of frustration. The 'integrative' mode of functioning within the homicide framework would be people who kill themselves (suicide).

Thus it can be seen that the action system model has the potential to be applied to a variety of crimes, even those as complex as homicide. Future research is needed to determine whether empirical categories of these crimes exist that correspond to this theoretical framework.

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## APPENDIX A: ARSON VARIABLES

### Crime-Scene Characteristics

#### 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 that was known to contain 'squatters' would be classified as residential.

#### 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.

#### 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.

4. Public building  
this includes any type of building to which the public have access, e.g. library, church, town hall, law courts, police station, etc.
5. Hospital/institution  
again, if the fire is set on any part of the institution's grounds then it is coded as institution.
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.
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.
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.
9. Own home  
this is coded in addition to residential and/or self.
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, for example, if the offender travelled any great distance to the target, by-passing other buildings with similar properties. Also, if the victim was known, and the fire followed a dispute, then it can be inferred that the victim was targeted.
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.
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.
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.

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.
15. Prior threats towards victim  
this includes verbal or physical threats of an overt or implicit nature.
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 count as threats of arson.
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.
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.
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.
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.
21. Accelerant used  
again, there is usually mention of an accelerant in the fire investigator's report.
22. Material brought  
anything which the offender brought for the specific purpose of starting or accelerating the fire, would be coded as this. It is 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.
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.

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.
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.
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.
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.
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.
29. Drug use  
this refers to any recreational, i.e. non-prescription drug, including solvents.
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.
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.
32. Weekday  
a weekday is classified as being between 00 : 01 on a Monday and 16 : 59 on a Friday.
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.
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.
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.

36. **Theft from premises**  
this variable would be coded if any property is taken either before or after the firesetting.
37. **Other crime**  
if the firesetting occurs in conjunction with any other offence, e.g. vandalism, burglary, theft of a car.
38. **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.
39. **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.
40. **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. It is important that the offender knows that the other person is present, therefore a passerby who happens to see the firesetting would not be coded as a witness.
41. **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.
42. **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.
43. **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.
44. **Crusade**  
this is coded if the firesetting appears to be attention or recognition seeking, e.g. if the offender him/herself 'discovers' the fire, or exaggerates injuries sustained.
45. **Finance**  
this refers to the offender's belief that he/she will financially or otherwise benefit directly from the fire. The benefit need not be in terms of a monetary

gain, e.g. persons in council housing who wish to be moved would be coded as 'financial'. This variable does not, however, refer to theft of property during the arson, as the financial gain has to come as a result of the arson, rather than being incidental to it.

46. Outburst

if the fire contains multiple seats and/or multiple items and takes place in a 'frenzied' attack, e.g. smashing up the targeted property.

### Offender Characteristics

1. No CRO  
the offender has no previous convictions of any kind.
2. Previous arson  
this is the same variable as in the offence variables list.
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.
4. Female
5. Partner
6. Child
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.
8. Institution  
this is coded if the offender is living in any kind of institution, e.g. hospital or juvenile detention centre.
9. Living with parents  
the offender is living in the care of his/her parents or legal guardians.
10. 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.
11. 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.
12. Manual work  
either skilled or unskilled manual work, e.g. plumber, laborer, factory worker.

13. HiQuals  
this is coded if the offender has obtained secondary or tertiary qualifications of any kind.
14. White
15. 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.
16. 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.
17. 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.
18. 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.
19. 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.
20. Suicide  
this is coded if the offender has any history of threatened or actual self-harm.
21. 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.
22. School trouble  
this is coded if there is any history of behavioral or academic problems at school.
23. School before 16  
if the offender left school before the age of 16.
24. 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.
25. AWOL  
at the time of setting the fire, the offender was supposed to be somewhere else, e.g. at school or at work.

## APPENDIX B: TERRORIST VARIABLES

1. Location political  
the location of the attack was a political building (e.g. an embassy, House of Congress, political meeting).
2. Location public  
the location of the attack was a public building (e.g. a hotel, restaurant, bank).
3. Siege lasted under one day
4. Siege lasted between two and five days
5. Siege lasted over six days
6. Hostages specifically targeted by terrorists  
(as opposed to random or opportunity hostages).
7. Terrorist group (not lone terrorist)
8. Number of hostages up to 10
9. Number of hostages 11 or over
10. Direct threat to hostages lives stated  
explicitly reported direct threat.
11. Structured threat given with deadline  
specific time given when hostages would be injured or killed if demands were not met.
12. Hostages injured by terrorists during siege
13. Hostages killed by terrorists during siege
14. Terrorists possessed/claimed to possess guns
15. Terrorists possessed/claimed to possess explosives (including grenades)
16. Terrorists made threats to bomb  
threats to bomb the building they are situated inside.
17. Terrorists demanded safe escape
18. Terrorists demanded release of prisoners/family members  
demand for the release of political prisoners or family members being held by any authority.
19. Terrorists demanded money
20. Terrorists demanded end of political action, or other political demand such as asylum  
ceasing of action includes demanding the authority to stop military action, demands such as seeking to stay in the country of the attack or seeking escape to another country for political reasons.

21. Authority offers alternatives to the terrorist demands  
authority may offer to release fewer prisoners than was initially demanded; a lower amount of money and so on.
22. Authority concedes to any part of the terrorist demands  
this includes any part of any terrorist demand; such as one prisoner being released, transport being provided and so on.
23. Authority allows escape of terrorists to other country  
the Bangkok option; whereby terrorists are offered safe escape to another country in return for the safe release of hostages.
24. International discussion about the incident occurs  
more than one country is involved in talks about the incident and how to proceed.
25. International disagreement about dealing with the incident is reported  
dissent about how to proceed is reported among representatives from more than one authority.
26. Terrorists change or reduce their demands (including extending deadlines)  
spontaneous reduction or change to initial demands made.
27. Terrorists contact or demand to contact media  
included terrorist initiated contact and contact facilitated through authority contact.
28. Terrorists release one or more hostages during the siege  
this occurs whilst the incident carries on, before the ending of the incident.
29. One or more terrorists escape during the siege  
this is the desertion of the scene and of fellow terrorists while the incident continues.
30. One or more hostages escape during entry stage or during siege
31. Terrorists engage in dialogue with hostages during the incident (explicitly reported)
32. Authority storms the building  
may involve police/army/special forces in forcibly storming the incident location
33. Authority attempts and fails to storm building  
authority forces are forced to retreat from their intervention by terrorist retaliation.
34. Terrorists killed during forcible authority intervention  
terrorists are killed (by authority forces or inadvertently by another terrorist) by any weapon or through gunfire either from terrorists or authority forces, or of indeterminate origin.

35. Hostages killed during forcible authority intervention  
hostages are killed by any weapon or through gunfire either from terrorists or authority forces, or of indeterminate origin.
36. Authority agents killed during forcible authority intervention (police/army/special forces)—authority agents killed by any weapon or through gunfire either from terrorists or authority forces, or of indeterminate origin.
37. Terrorists captured by force either at the scene or later by pursuit  
terrorists captured immediately at the scene or any length of time later after authority efforts to arrest.
38. Hostages wounded during forcible authority intervention  
hostages wounded by any weapon or through gunfire either from terrorists or authority forces, or of indeterminate origin.
39. Authority agents wounded during forcible authority intervention (police/army/special forces)  
authority agents wounded by any weapon or through gunfire either from terrorists or authority forces, or of indeterminate origin.
40. Terrorists surrender (one or more)  
this takes place as a cause of the end of the incident.
41. All hostages are safely released at the end of the siege (does not include cases where hostages were killed)
42. Negotiation between terrorists and authority occurred  
at any stage during the incident
43. Terrorists killed or injured people during entry to the barricade siege building  
these may have been potential hostages, security guards or any other persons injured or killed in the period while the terrorists entered the building, whilst seizing hostages and before the exact location within the building is stable.
44. A shoot-out between terrorists and authorities occurred  
gunfire is exchanged by authority agents outside the building with terrorists who remain inside the building.