Chapter 19

Where Next? Identifying Firesetting Research Priorities

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**Introduction**

In this final chapter we identify future research priorities for the advancement of firesetting knowledge. The assumption that underpins the chapter is that the research corpus relevant to firesetting is seriously under-developed relative to that for other problematic or criminal behaviours. If this premise is true then future developments might result in a body of research that shares a topography with that of violent or sexual offending. Of course, however, this is not to say that similar conclusions will be drawn. Were new studies to proliferate in the field of firesetting then we would expect to advance to a point where we can confidently talk about ‘*what* *works* in reducing firesetting recidivism’.

To demonstrate the relative lack of knowledge in the field of firesetting we used the bibliographic research database *Scopus*. First, we searched document titles, keywords and abstracts for the term *violence*. This returned 88, 447 documents, while *crime* returned 88, 230 and *aggression* 63, 197. Searches using legal terms for specific offences revealed that the volume of global research related to *terrorism* (21, 313 documents) and *homicide* (18, 977 documents) was greater than that for *rape* (18, 231), *assault* (16, 224), *forgery* (9, 422), *theft* (7, 907), *harassment* (4, 973), *infanticide* (3, 043) and *robbery or burglary* (2, 493). The combined terms *firesetting or arson* returned 1, 860 documents while *stalking* (1, 115) and *kidnap* (1, 043) returned fewer. So, on a crude count of research volume for a selected range of criminal behaviours, firesetting ranked tenth of twelve. Of course, these crude calculations cannot tell us how much firesetting research there *should* be. However, we contend that the likely prevalence and impact of deliberate firesetting warrants far greater attention than it has thus far received.

Our program of research, outlined below, is structured around the factors that constitute the Multi-Trajectory Theory of Adult Firesetting (M-TTAF; Gannon et al, 2012; see Chapter 1). Emerging research evidence is generally supportive of the proposed M-TTAF trajectories (Fritzon, Doley, & Bell, 2014), but this validation is based on retrospective data, re-analysed in light of the M-TTAF’s emergence. Larger scale studies with variables operationalised in specific M-TTAF compatible terms are required. We examine the constituent elements of multifactor theories and speculate how knowledge might be advanced in each.

*Epidemiology*

While not an explicit component of the M-TTAF model, an understanding of the extent of deliberate firesetting behaviour is central to our understanding of it: if our knowledge about who sets fires is limited then so is our ability to generalise an aetiological model. The epidemiological evidence for deliberate firesetting currently largely relies on a single question nested in the assessment battery of the US National Epidemiological Survey of Alcohol and Related Conditions (Blanco et al, 2012; Hoertel, Le Strat, Schuster, & Limosin, 2011; Vaughn et al, 2011). Just over one per cent of a large, demographically representative, non-institutionalised US adult sample concurred that in their entire lifetime they had “deliberately started a fire to destroy someone else’s property or just to see it burn”; of these, 38% confirmed the behaviour had occurred since age 15 years (Vaughn et al, 2010). We have previously commented that responses to this question may reflect reporting bias due to the face-to-face nature of interviews, and may conflate problematic and non-problematic firesetting (Dickens & Sugarman, 2012, Gannon & Barrowcliffe, 2012). Certainly, other studies of prevalence among adults (Gannon & Barrowcliffe, 2012; Odlaug & Grant, 2010), and studies of firesetting behaviour in adolescents (e.g., Mackay, Paglia-Boak, Henderson, Marton, & Adlaf, 2009), suggest that NESARC has considerably underestimated the scale of the issue. Further research is required to clarify the true level of deliberate firesetting in the general population using validated measures. Inclusion of firesetting items on future large-scale surveys is warranted and careful thought should be given to wording.

*Developmental aspects*

While research into firesetting behaviour during childhood and adolescence is relatively well developed compared with that into adult firesetting (see Chapter 2), there is a dearth of knowledge about the relationship between firesetting in youth and its continuation into adulthood. In short, models like the M-TTAF which posit trajectorial development involving multiple factors require longitudinal, observational studies with designs that maximise confidence in the identification of causal factors, for example inverse probability of treatment weighting (Robins, Greenland & Hu, 1999).

In the violence research field, cohort studies like that centred on Dunedin, New Zealand have significantly advanced understanding of the biological, social and combined risk factors for life-course persistent antisocial behaviour (Moffitt, 1993). Future studies should fully integrate the study of firesetting behaviours and associated risk factors as distinct from general criminal and antisocial activity. Specific areas for attention will include the family or caregiver environment: in particular the existing research on childhood attachment styles of adult firesetters is poor (Gannon & Pina, 2010).

We currently know that there is a strong familial risk for violent crime – one of the strongest being for arson (Frisell, Lichtenstein & Langström, 2011). This Swedish total population study reported that individuals were over twenty times more likely to be convicted of arson (OR 22. 4 95% CI 12. 2-41. 2) if they had a sibling also convicted of arson, suggesting that genetic and/or early environment are significant contributors. That there is variation in the pattern of familial risk and different crimes suggests different patterns of aetiology for different behaviours and this further supports the need to investigate familial factors in the case of firesetting specifically rather than simply as one ‘crime’ study. Differences in familial risk for violent crime between lower and higher socioeconomic groups suggest a varying role of environment versus genetic influence, and there is a need to investigate this further.

Additionally, there is a need to compare individuals with both their relatives and with unrelated matched controls in order to help disentangle the noise around genetic versus environmental effects. Currently, there is no evidence from systematic research about the role of genes in firesetting. While it is unlikely that a *firesetting gene* exists there is a wealth of research from twin and adoption studies that suggest individual differences in violent behaviour are heritable (Rhee & Waldman, 2002) and that the probable mechanism lies in differences in neurocognitive functioning (Lesch, 2003). Given the diversity of firesetting behaviours and associated factors one aim should be to determine the role of heritability in different groups, for example M-TTAF trajectory groups. The role of neurotransmitters, brain structure and function in recidivistic firesetters could provide fertile ground for future research.

One potential research avenue that appears very much overlooked, yet is often subsumed within theories of firesetting behaviour (e.g., the M-TTAF; Gannon, Ó Ciardha, Doley, & Alleyne., 2012), is that of social learning and the role of fire-related reinforcement experiences. It makes intuitive sense that both positive and negative experiences with fire will play an important role in the development of fire interest and/or entrenched preferences to use fire as a criminal tool. In their study of mentally disordered firesetting, Tyler, Gannon, Lockerbie, King, Dickens and De Burca (2013) found some evidence to suggest that both positive and negative experiences with fire as a child were likely to impact upon an individual’s choice to misuse fire. Clearly, further research examining this issue retrospectively (i.e., via qualitative interviews) is one potential avenue for elaborating upon this preliminary finding.

A further area of focus is the role of culture in determining the meaning of malicious firesetting behaviour. Indigenous people have used fire over thousands of years, for hunting, pest control, land clearing, warmth and light. In Indigenous cultures fire is understood as being essential to the continued good health of the country (Hughes, 1995). The connection between Indigenous people and fire is immersed in cultural and sacred significance as much as it has to do with practical and economic factors. If it is assumed that similar patterns of cognitions apply to both Indigenous and non-Indigenous firesetters, then there is an increased probability of inappropriate treatment targets being identified. Thus, future firesetting research needs to ensure that cultural factors are examined and given more priority. Until then, it will be difficult to develop appropriate intervention strategies to address malicious firesetting in individuals from Indigenous backgrounds.

*Psychological vulnerability*

With some exceptions the current firesetting literature comprises small to medium scale studies primarily of institutionalized individuals, often those with mental disorder, and often with non-existent or inadequate control groups. These issues have all hindered the progress of research into the specific psychological vulnerabilities that may contribute to firesetting behaviour.

One area that holds some promise is investigation of the role of fire-related implicit theories, or offense-supportive schemas. Ó Ciardha and Gannon (2012) have suggested five potential implicit theories that may be held by firesetters; three are fire-specific (that *fire is a powerful tool*, that *fire is fascinating*, and that *fire is controllable*) and two are more general (that it is a *dangerous world* and that *violence is normal*). The authors explicate how the implicit theories would be expected to be present in different combinations in individuals with features resembling each of the prototypical M-TTAF trajectories. For example, a *grievance trajectory* firesetter may believe that it is a dangerous world, that violence is normal and that fire is a powerful tool to extract satisfaction. Fascination with fire and a belief that fire is controllable may be less expected in this group. This is potentially important given that, if correct, it supports the targeting of psychological interventions to those areas where inappropriate fire-related scripts are present.

It is likely that accurate assessment of the role of cognitive processes will require the development of tools that can circumnavigate problems associated with self-report. In short, reported implicit theories may reflect post firesetting rationalisation. Currently, research into juvenile firesetting is ahead of that into the adult equivalent. The Pictorial Fire Stroop (Gallagher-Duffy, MacKay, Duffy, Sullivan-Thomas & Peterson-Badali, 2009) is an implicit measure of processing bias comprising pictures of fire-related material and control pictures depicting thematically neutral material. Results thus far have suggested that attentional bias is negatively associated with self-reported fire interest but positively associated with number of previous fires lit, suggesting that there may be incongruence between self-report and this indirect cognitive measure. Tools like the PFS require validation in other groups including adults. If successful then longitudinal research would facilitate the examination of developmental trends, for example does childhood bias predict future adult behaviour?

*The role of mental disorder*

Larger studies are beginning to demonstrate that a potentially complex set of relationships undermines the credibility of a simple, causal link between all types of mental disorder and an increased risk for firesetting. In a national data linkage study in Sweden, Anwar, Langstrom, Grann, and Fazel (2011) found that, after adjustment for sociodemographic confounders, convicted arson offenders were considerably more likely than population controls to be diagnosed with schizophrenia (Male OR 22. 6 95% CI 14. 8-34.4; Female OR 38. 7 95% CI 20. 4-73. 5) and thus appeared to be considerably more at risk for arson than other violent crimes with the exception of homicide. This finding raises important questions: are there specific illness-specific risk factors for arson among people with schizophrenia such as particular threat/control override symptoms (see Link & Stueve 1994). This has proved a fruitful line of research in studies of aggressive behaviour in psychotic patients (Nederlof, Muris & Hovens, 2011).

One limitation of the Swedish study is that its results may best represent individuals who set more severe fires. A further question raised by Anwar et al (2011) in relation to the prevalence of arson in schizophrenia is its relationship with the high prevalence of tobacco smoking in this group. For example, what role does the immediate availability of an ignition source play in firesetting in this group. Most recently, anger as a result of particular delusional beliefs – namely persecution, being spied on, and, conspiracy - in people with psychosis has also been shown to mediate serious violence (Coid, Ullrich, Kallis, Keers, Barker, Cowden & Stamps, 2013). These and similar questions could all be asked specifically of firesetters with psychosis.

While a number of studies have described samples of institutionalised firesetters with mental disorder there was, until very recently, little research that explored the chain of events leading to their firesetting behaviour. Recent work by Tyler et al. (2013) using grounded theory methodology to analyse detailed offence accounts of 23 mentally disordered firesetters has addressed this to some extent. In so doing it has highlighted motivations for firesetting that have received very little attention (e.g., firesetting in order to protect oneself from perceived harm). More research in this vein is warranted with ever larger samples utilising comparisons between different diagnostic groups. The development of models from studies like this holds the potential to assist with treatment, for example by helping offenders to understand their own risk triggers.

Some consideration of firesetting as a mental disorder – namely pyromania - in itself would be incredibly helpful for the field. The Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5; American Psychiatric Association, 2013) categorises pyromania in a newly amalgamated chapter bringing together disorders previously described in two chapters in DSM-IV-TR (APA, 2000): ‘Disorders usually first diagnosed in infancy, childhood or adolescence’; and ‘Impulse control disorders not otherwise specified’. However, the diagnostic criteria have not themselves changed, perhaps suggesting few direct implications arising from the new classificatory model. Some debate still remains about the precise proportion of firesetters who meet the very strict inclusion and exclusion criteria for pyromania diagnosis. Many firesetters do appear to hold some ‘fascination with, interest in. . . or attraction to fire’ or ‘pleasure, gratification or relief when setting fires. . . ’ (APA, 2013, p. 476) but are excluded for reasons such as acute alcohol intoxication, psychosis or antisocial personality disorder (Lindberg, Holi, Tani & Virkkunen, 2005). The field would benefit from research or detailed theoretical commentary aimed at understanding exactly how the current diagnosis of pyromania is helpful for the purposes of assessment, treatment and research.

*Treatment and intervention*

If there is one area of the firesetting literature on which commentators agree it is about the almost entire lack of an evidence base for treatment and intervention (Hollin, Davies, Duggan, Huband, McCarthy & Clarke, 2013). This situation is holding back development of both psychological and pharmacological treatment recommendations (Grant, Schreiber & Odlaug, 2013). Rather colourfully, Gannon and Pina (2010) have characterised the current level of understanding about treatment efficacy as ‘developmentally stunted’. As we write we await full details of the world’s first controlled trials of firesetting group interventions (i.e., the *Firesetting Intervention Program for Prisoners* and *Firesetting Intervention Program for Mentally Disordered Offenders* respectively; Gannon et al., 2014; Tyler et al., 2014)*.*

*Risk assessment*

There is currently no standardised actuarial or structured clinical judgment tool intended to assist practitioners judge the level of risk of firesetting specifically. This may remain the case for the foreseeable future because research is needed to ascertain the presence of fire specific factors in offenders alongside more general criminogenic factors, for example early fire interest and behaviours related to type of firesetting, fire cognition, and the immediate triggering environment. Recent advice (Ducat, McEwan, & Ogloff, 2013; Gannon & Pina, 2010) has been to use general violence risk assessment tools such as the Level of Service Inventory-Revised (LSI; Andrews & Bonta, 1995) or the HCR-20 (Webster, Douglas, Eaves & Hart, 1997) and supplement this with knowledge from the general firesetting literature. More recently, however, with the advent of firesetting theory in the form of the M-TTAF (Gannon et al., 2012), professionals have begun to advocate the use of such theory to structure and format comprehensive risk assessments in the area of firesetting (see Watt & Ong, Chapter 11). Clearly, the immature state of knowledge in the area of firesetting risk prediction leaves considerable room for interpretation. Thus, there is an urgent need to establish the effectiveness of varying methods of structuring and assessing risk for firesetting.

*Investigation*

The role of policing in relation to arson offending has traditionally focused on detection and offender apprehension. Increasingly, there is now community investment in prevention of firesetting incidents through education and awareness, seasonal campaigns, and crime reporting initiatives. Policing strategies around interviewing techniques specifically designed to interact and capitalise on specific psychological and social features associated with firesetters is an area that warrants further exploration. This should follow as knowledge of the aetiological factors around firesetting is developed further. Law enforcement, probation and parole services should also be concerned with developing appropriate monitoring regimes for convicted arson offenders released from prison, as well as for suspected firesetters. Researchers will be in a stronger position to advise on appropriate frequency and intensity of such strategies when there is better understanding of the factors driving recidivist firesetters. Researchers should also focus on understanding the interaction between local culture and crime reporting. In this way, public messages focused both on prevention and detection of deliberate firesetting is likely to be significantly impactful and directly linked to the local context.

**Conclusion**

Demonstrating the current lack of evidence relative to that for other troubling behaviours has proved a somewhat simple task. Making significant advances will prove more difficult, particularly if the evidence reflects to any great degree the relative size of the public commitment, financial and otherwise, to tackling this important issue, or the academic community’s appetite to meet the need. Accordingly, as well as a need for more and better research into firesetting as a matter of priority, academics and researchers must also continue to strive to persuade the *demos* and their representatives of the importance of the issue. Practitioners also should demand better evidence for practice, and service commissioners and funders should require evidence of treatment effectiveness.

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