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Firesetting: Psychopathology, Theory and Treatment

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Abstract

In this paper, we comprehensively review the characteristics of adult firesetters, and the etiological features of firesetting. In particular, we pay attention to contemporary research available regarding the core traits and psychopathological features required to understand firesetters, and the classificatory systems and etiological theories developed to understand firesetting. This evaluation of contemporary research suggests that clinical knowledge and practice relating to firesetting is extremely underdeveloped relative to other areas of forensic-clinical psychology. We conclude that there are very few etiological theories available to guide consulting clinicians in this area, and little information available specifying the exact criminogenic needs associated with firesetters, or how these needs compare to other offender groups. The significant lack of contemporary treatment programs designed to target firesetting behavior is also noted. We conclude by highlighting core areas for future research and treatment progression.

Key Words: Firesetting; Pyromania; Arson; Theory; Treatment

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Intentional firesetting has devastating consequences both personally and financially. Latest available statistics show that around 323,900 intentionally set fires were recorded by US fire departments in 2005 and these fires caused 490 deaths, 9,100 injuries, and created over 1 billion dollars of costs relating to property destruction (Hall, 2007). Given the enormous societal costs associated with intentional firesetting, it is curious that current psychological understanding of this act is relatively underdeveloped, especially when one compares the extant firesetting literature to that relating to violence or sexual offending. The only existing reviews on firesetting behavior have tended either to focus solely upon child and juvenile firesetters (Kolko, 1985), or have approached firesetting from a psychiatric perspective (Blumberg, 1981; Geller, 1987; Geller, 2008; Ritchie & Huff, 1999). Thus, there is a strong need for a psychologically-informed review on firesetting for consulting clinicians and forensic psychologists who work with adult firesetters.

Our paper does not intend to provide an *exhaustive* review of firesetting since to do so would entail numerous historical pieces. However, we do aim to provide a comprehensive and contemporary overview of the diagnostic criteria, etiological features, theory, and treatment relevant to adult firesetting. Our main aim is to provide clinical practitioners with a comprehensive psychological understanding of adult firesetters, paying particular attention to clinical and etiological features, firesetting behavioral specificity, issues of diagnostic criteria relevant to pathological firesetting, and current treatment issues. Based upon this review, we then make some suggestions for future empirical research and evidence-based practice relevant to firesetting. In order to increase the clarity and focus of this review, and unless otherwise stated, we will focus our discussions on firesetting committed by individuals over the age of 18. We will, however, refer to research with juveniles and children where we feel it is appropriate to do so. Further, because the majority of known adult firesetters are male (Lewis & Yarnell, 1951; Rice & Harris, 2008), we will focus our review on male firesetters (readers interested in female firesetters should consult Stewart, 1993, or Gannon, in press).

Defining Firesetting

In law, intentional firesetting is typically referred to as *arson*. Arson may generally be defined as the intentional destruction of property—via fire—for unlawful purposes (Kolko, 2002; Williams 2005). In the US, the exact legal definition of arson may vary across states. Typically, however, the following criteria are present in legal definitions of arson: (i) there must be some element of *intention* underlying the act; (ii) the fire must be set for an *unlawful purpose* (i.e., to harm others or to profit fraudulently), and (iii) the fire must *damage* property or belongings in some way (Federal Bureau of Investigation, 2004; Hall, 2007; Kolko, 2002; Williams 2005). Since arson is a legal term that may vary across jurisdictions, we choose not to use it throughout this review. Instead, we will use the term “firesetting” to refer to all *intentional* acts of setting fire. This definition ensures that we encapsulate maximal motives associated with firesetting as observed by the consulting clinician.

Firesetters' Characteristics

Information about the known characteristics of firesetters is vital for the consulting professional since this information can highlight key areas for clinical assessment and exploration. Such information can also provide guidance on the various treatment needs and responsivity factors relevant for individual or group work with detected firesetters.

Sociodemographic Features

Figures suggest that the ratio of male to female firesetters may fall in the region of 6:1; a proportion of around 14% (Bourget & Bradford, 1989; Lewis & Yarnell, 1951; Stewart, 1993¹) and the majority of apprehended firesetters are white (Bennett & Hess, 1984; Ritchie & Huff, 1999; Rix, 1994). Generally, male firesetters admitted for psychiatric evaluation appear similar to other criminals on factors such as low economic status, poor education, and unskilled employment (Doley, 2003a; Hurley & Monahan, 1969; Rice & Harris, 1991; Räsänen, Hirvenoja, Hakko, & Väisänen, 1995; Ritchie & Huff, 1999 WOLFORD, 1972). However, a large number of studies have shown that firesetters are generally younger than

¹ see Dickens, et al. (2007) for a comparison of male and female firesetters' characteristics

non-firesetting criminals (Hurley & Monahan 1969; Rice & Harris, 1991). Other researchers have suggested that firesetters may be characterized by lower IQ levels relative to non-firesetting criminals (Lewis & Yarnell, 1951; Rice & Harris, 1991).

Offending History

Several studies show that firesetting is often part of a wider array of general offending (Rice & Harris, 1996; Ritchie & Huff, 1999; Hill et al., 1982; Sapsford, Banks, & Smith, 1978; Soothill, Ackerley, & Francis, 2004). However, firesetters' offending histories appear to be more similar to that of property offenders than violent offenders (Hill et al., 1982; Tennent, McQuaid, Loughnane, & Hands, 1971; Vreeland & Levin, 1980). For example, Hill et al. (1982) compared the offense histories of individuals referred for psychiatric assessment due to firesetting with other inpatient referrals predominantly characterized by either property or violent offenses. Overall, Hill et al. found that the majority of firesetters were characterized by one or more recorded criminal charges. However, the firesetters' profiles appeared to be different both to the violent and the property offenders. In short, firesetters appeared less violent than the violent offenders, yet more violent than the property offenders. Using discriminant analyses procedures, in which previous violence, psychiatric diagnoses, and substance abuse associated with offending were identified as predictors, Hill et al. attempted to classify firesetters as either property or violent offenders. Using this procedure, 60% of the firesetters were characterized as property offenders. Other researchers have also concluded that firesetters are not generally characterized by interpersonal violence (Jackson, Glass, & Hope, 1987a; Hurley & Monahan, 1969; Räsänen, et al., 1995; Soothill et al., 2004) or sexual offending (McKerracher & Dacre, 1966). In support of these findings, recidivism research shows that firesetters are more likely to recidivate non-violently than they are to recidivate violently over a mean follow up period of 7.8 years (57% non violent recidivism versus 31% violent recidivism; Rice & Harris, 1996). Nevertheless, firesetters do recidivate violently and it appears likely that aggression plays a significant role in firesetting behaviors; although the nature of this aggression seems avoidant (see McKerracher & Dacre's Displaced Aggression

Hypothesis, 1966). In summary then, firesetters can and do display interpersonal violence. However, the majority of firesetters are typically versatile, engaging in numerous instances of both theft and property offenses.

Developmental Features

Studies show that, relative to non-firesetters, children who set fires are more likely to originate from large and financially impoverished families (Bradford, 1982; Heath, Hardesty, Goldfine, & Walker, 1983) characterized by neglectful parenting styles (Showers & Pickrell, 1987; Slavkin, 2000) and physical or sexual abuse (McCarty & McMahon, 2005; Moore, Thompson-Pope, & Whited, 1996; Showers & Pickrell, 1987). Such experiences are highly likely to negatively affect a child's ability to form secure attachments with caregivers (Perry, 1997), and also their ability to develop appropriate social skills and affective self regulatory behavior during adolescence and adulthood (Ainsworth, 1989; Bowlby, 1969, 1973; Root, MacKay, Henderson, Del Bove, & Warling, 2008). In support of this hypothesis, Root et al. (2008) have demonstrated that the link between developmental abuse and juvenile firesetting is mediated by affective and behavioral difficulties, although it is unclear from this study whether the same link persists into adulthood.

To our knowledge, there are no studies that focus on firesetters' childhood or adult attachment styles and compare the prevalence of these to adequate non-firesetter control groups. However, a number of professionals have observed seemingly dysfunctional attachment styles in firesetters as a result of pathogenic caregiving experiences (Focus Adolescent Services, 2009; Räsänen, Puumalainen, Janhonen, & Väisänen, 1996). Other researchers have noted that firesetters are typically single men who are characterized by loneliness and impoverished social support networks (Barracato, 1979; Bennett & Hess, 1984; Inciardi, 1970; Leong, 1992; Rice & Harris, 1991, 2008; Ritchie & Huff, 1999). Nevertheless, poor attachment relationships and interpersonal social functioning appear to characterize many criminals who do not set fires (Frodi, Dernevik, Sepa, Philipson, & Bragesjö, 2001; Ross & Pfäfflin, 2007; Van Ijzendoorn et al., 1997; Ward, Hudson, &

Marshall, 1996) limiting the conclusions that may be drawn from these observations.

In terms of specific attachment *disorders*, firesetting is not specifically identified as a core symptom of Reactive Attachment Disorder (RAD) as classified by DSM-IV-TR (American Psychiatric Association; APA, 2000). However, a variety of anti-social behaviors displayed during childhood may be accounted for by RAD, suggesting that firesetting behavior is unlikely to be predicted by a particular attachment disorder or style *per se*, but may instead reflect individual differences in fire interest and early socialization with fire (see Social Learning Theory described later).

Associated Traits

Perhaps unsurprisingly given the developmental adversities experienced by firesetters, many researchers have reported that firesetters exhibit poor assertiveness and communication skills (Jackson et al., 1987a; Rice & Chaplin, 1979; Rice & Harris, 2008), low self-esteem (Smith & Short, 1995; Swaffer, Haggett, & Oxley, 2001), and high levels of impulsivity (Räsänen et al., 1996). Some researchers have also argued that firesetters are unlikely to be interpersonally aggressive (Bennett & Hess, 1984; Jackson, et al., 1987a; Hill et al., 1982; Rice & Harris, 1996), although such conclusions are contentious given that a good proportion of firesetters are known to recidivate violently (Rice & Harris, 1996). Finally, some researchers have noted a tendency for firesetters to hold very low thresholds of frustration tolerance (Jackson, 1994; Tennent et al., 1971); a finding suggesting that some firesetters use fire as a method of emotional expression (see also Canter & Fritzon, 1998).

Psychopathology

Pyromania. Within DSM-IV-TR (APA, 2000) firesetting is referred to as either (a) a deliberate destruction of property that may characterize conduct disordered children or adolescents (312.81, 82, 89), or (b) *Pyromania*, a psychiatric impulse-control disorder *not otherwise specified* (312:33). For conduct disordered youngsters, firesetting appears to represent just one of a wide array of antisocial behaviors involving repetitive violations of age appropriate societal norms and others' rights. Diagnosis of *pyromania*, however, is dependent upon an intense

fascination with and desire to associate oneself with fire and fire paraphernalia. A diagnosis of pyromania is dependent upon (a) deliberate and multiple firesetting, (b) tension or arousal prior to firesetting, (c) fascination, and attraction to fire, fire paraphernalia, and the consequences of fire, and (d) pleasure, gratification or relief upon firesetting or witnessing and participating in the consequences. Furthermore, for a diagnosis of pyromania to be made, the firesetting must not be motivated by financial gain, sociopolitical ideology, desire to mask criminal activity, expression of anger or revenge, an intention to improve living circumstances, or be the result of delusions, hallucinations, or any other form of judgment impairment (e.g., intoxication, dementia, or retarded functioning). Finally, the firesetting must not be better accounted for by the other psychiatric diagnoses of conduct disorder, mania, or antisocial personality disorder.

Given this strict diagnostic criteria, it is perhaps unsurprising that DSM-IV-TR describes diagnoses of pyromania amongst firesetters as “apparently rare” (p. 614). In support of this, many researchers report difficulty detecting *pure* pyromania in samples of firesetters with a majority of researchers reporting either no pyromaniacs in their cohorts (Leong, 1992; Geller & Bertsch, 1985; O’Sullivan & Kelleher, 1987; Prins, Tennent, & Trick, 1985), or very small estimates in the region of 3 to 10% (Bourget & Bradford, 1989; Lindberg, Holi, Tani, & Virkkunen, 2005; Ritchie & Huff, 1999). It is unclear whether DSM-IV-TR’s exclusion criteria unnecessarily limit the range of situations and persons for which diagnoses of pyromania may be made. For example, it is plausible that many individuals who suffer from the core constituents of pyromania (i.e., criterion A, B, C, D, and E) use substances around the time of their offending, and that this heightens their arousal. Furthermore, individuals who hold an intrinsic fascination and attraction to fire may use firesetting to meet multiple needs (e.g., to express anger), or may light relatively controlled fires unknown to other individuals (see Grant & Kim, 2007). Clearly, then, the restrictive definition of pyromania within DSM-IV-TR may well account for the small and even non-existent estimates of pathological firesetting documented within the literature.

General Psychopathology. The most common diagnoses associated with firesetting appears to be conduct disorder or antisocial personality disorder (APA, 2000; Bradford, 1982; Heath et al., 1985; Kolko, 1985; Kolko & Kazdin, 1991a; Kosky & Silburn, 1984; MacKay et al., 2006; Martin, Bergen, Richardson, Roeger, & Allison, 2004; Repo & Virkkunen, 1997; Sakheim & Osborn, 1999). In fact, empirical research with Finnish firesetter recidivists shows that antisocial personality disorder predicts recidivist firesetting (Lindberg et al., 2005) and, conversely, firesetting behavior flags those individuals characterized by the most extreme antisocial pathology (Becker, Stuewig, Herrera & McCloskey, 2004; Martin et al., 2004).

Within the adult firesetting population, commonly documented comorbid diagnoses are schizophrenia (Geller, 1987; McKerracher & Dacre, 1966; Ritchie & Huff, 1999; Virkkunen, 1974), substance dependence (Grant & Kim, 2007; Räsänen et al., 1996; Ritchie & Huff, 1999), affective disorders (Geller, 1987; Grant & Kim, 2007; Ritchie & Huff, 1999), anxiety disorders (Grant & Kim, 2007), and personality disorder (Barnett and Spitzer, 1994; Geller, 1987; Lindberg et al., 2005; Tennent et al., 1971; Virkkunen, DeJong, Bartko, Goodwin, & Linnoila, 1989). Pyromania—in particular—is also associated with impulse control disorders; most notably kleptomania and compulsive buying (Grant & Kim, 2007). What is unclear, however, is whether any particular patterns of these comorbid features are unique to firesetting *per se*. Few researchers have examined the prevalence of psychopathologies in firesetters using standardized psychometric tests (e.g., the *Minnesota Multiphasic Personality Inventory*; MMPI, Hathaway & McKinley, 1967). And, when such tests have been used, they have typically been conducted with juvenile firesetters (Moore et al., 1996), or with adult firesetters in the absence of adequate control groups (Koson & Dvoskin, 1982). In one notable exception, Wolford (1972) administered the MMPI to firesetters, and other offender controls but failed to find any notable differences between these groups. Vreeland and Levin (1980), however, argue that both group profiles were psychopathological; seemingly suggesting that firesetters and other criminals hold similarly psychopathological characteristics. To date, then, there is very little controlled empirical research examining the

general psychopathological features of adult firesetters.

Sexual Psychopathology. A number of early writers hypothesized that firesetting, and in particular pyromania, was associated with some type of sexual psychopathy in the form of fetishism (see Doley, 2003b). However, although sexual motivators have been noted in some cases of firesetting (Rice & Harris, 1991; Rix, 1994), researchers have been unable to support any *discernable* link between firesetting and sexual psychopathy (Bradford, 1982; Lewis & Yarnell, 1951; Quinsey, Chaplain, & Upfold, 1989; Prins et al., 1985; Rice & Harris, 1991).

Theories of Firesetting

An essential foundation for effective assessment and treatment of criminal behavior is familiarity with, and comprehensive understanding of, etiological theory. Etiological theory provides a core foundation with which to map the interrelationships between an offender's presenting clinical phenomena and core psychological variables (i.e., *case formulation*; Gannon, Collie, Ward, & Thakker, 2008). In short, such case formulations specify (i) how clinical phenomena are generated by psychological factors, and (ii) the rationale required for specific tailored interventions to achieve optimal outcomes with individual offenders.

Within the sexual offending literature, Ward and Hudson (1998) have proposed a meaningful way of conceptualizing available theory into three main types: *single factor*, *multi factor*, or *micro theories*. Single factor theories are those which focus upon explaining a solitary factor, and its causal relationship to offending (e.g., social-learning theory, or psychodynamic theory). Multi factor theories, however, unite various single factor theories into one comprehensive overview of the offending behavior, providing an explicit account of how each of the factors interact or unite to produce conditions likely to culminate in offending. Finally, micro theories represent descriptive accounts of offending behavior based on data provided by offenders themselves regarding the cognitive, behavioral, volitional, and contextual factors associated with their crime.

One relatively crude form of theory development—taxonomic classification—is not directly specified within Ward and Hudson's (1998) theory conceptualization. Because

taxonomies subtype heterogeneous offender groups based upon shared motivational factors, such taxonomies may be viewed as *unilateral classificatory systems* that guide further theory development. These classificatory systems play a guiding role in core intervention strategies and treatment provision and may ultimately feed into multi factor theories of offense behavior. Within the firesetting literature, there are very few multi factor theories available to professionals, although there has been some proliferation of single-factor theories and taxonomic systems. In the following sections, we critically evaluate the range of taxonomies and theories currently available for clinicians working with firesetters before providing some suggestions for future theory development and research.

In order to aid our relative appraisals of *theory* (excluding classificatory systems), we will refer to a selection of theory appraisal criteria outlined by Hooker (1987) and Newton-Smith (2002). These writers argue that the following criteria are useful for aiding researchers in the difficult task of evaluating competing theories: *empirical adequacy* (i.e., is the theory supported by existing empirical evidence?), *external consistency* (i.e., is the theory consistent with other background theories that are currently accepted?), *unifying power* (i.e., does the theory bring together previously isolated research findings or theoretical perspectives?), *fertility* (i.e., does the theory provide new hypotheses, arenas for research, or clinical interventions?), and *explanatory depth* (i.e., does the theory refer to intricate and detailed operations when describing the intended phenomena?). Thus, we will evaluate each theoretical explanation of firesetting along each of these appraisal dimensions in an attempt to evaluate the *relative* usefulness of each perspective.

Taxonomies: Unilateral Classificatory Systems

One simple way of reducing the heterogeneity of firesetters is to condense them into more manageable descriptive classifications that may be used to aid treatment decisions. A number of firesetting typologies have been proposed based on offense characteristics,

professional observations² regarding the hypothesized motivational factors underlying firesetting, or some combination of both (Barker, 1994; Bradford, 1982; Faulk, 1994; Icové & Estépp, 1987; Inciardi, 1970; Lewis & Yarnell, 1951; Prins, 1994; Prins et al., 1985; Ravataheino, 1989; Rider, 1980; Rix, 1994; Scott, 1974; Vreeland & Levin, 1980).

Lewis and Yarnell (1951) are largely credited as being the first researchers to provide some type of classificatory system for grouping firesetters (although see Magee, 1933 for an earlier typological classification of pathological versus non pathological firesetters). Lewis and Yarnell attempted to provide one of the first empirical and objective evaluations of firesetters using 2000 reports of firesetting (the majority of which were committed by males) obtained from the National Board of Underwriters, US. Excluding those who set fires for profit, Lewis and Yarnell identified four categories of firesetters who were judged to have started fires: *unintentionally* (e.g., through temporary confusion), as the result of *delusions* (e.g., psychosis), for *erotic pleasure* (e.g., via pyromania type traits or sexual fetishism), and to obtain *revenge*; (e.g., through jealousy or feeling slighted in some way). Lewis and Yarnell also noted a further “child” category of firesetters who were hypothesized to start fires out of “mischief” or “excitement”. This typology has proved to be popular, and has been expanded upon by many researchers (e.g., Bradford, 1982). Lewis and Yarnell did not specify any psychological implications of their classificatory system, stating instead that, “the day may come, eventually, when these disorders will lend themselves to treatment and correction” (Lewis & Yarnell, 1951, p. viii). Surprisingly, it was some time later before further substantial firesetting taxonomies were developed.

In 1970, Inciardi examined the records of all paroled firesetters (97% male) released from New York State Prisons throughout 1961-1966. Six categories of firesetter were developed: *revenge*, *excitement*, *institutionalized*, *insurance claim*, *vandalism*, and *crime concealers*. The revenge firesetters (58%, $n = 80$) were by far the largest group detected. They were relatively

² We use the term professional here to include any professional involved in the prevention of firesetting including, but not limited to, fire personnel, psychiatrists, and clinical psychologists.

young men (median age = 28), of low intelligence (median IQ = 84) who had set fire to their victim's home or property out of vengeance or jealousy. Inciardi (1970) observed that the revenge firesetter was typically a loner, had a serious alcohol problem and was "the most dangerous of all arsonists" (p. 148) since his desire for vengeance typically overrode any thought for human safety. The excitement firesetter (18%, $n = 24$) refers to individuals who found it intrinsically exciting and satisfying to light fires and partake in the surrounding aftermath of that fire (cf. DSM-IV-TR's criteria for Pyromania; APA, 2000). These individuals were relatively young individuals (median age = 23; median IQ = 96) who were typically semi-skilled workers, and set fire to uninhabited buildings to get their "kicks". The institutionalized firesetters (6.5%, $n = 8$) were young (median age = 19) intellectually impaired individuals (median IQ = < 70) who were resident within mental health institutions. Their firesetting appeared to be motivated by attention seeking grievances in order to get themselves transferred from their institution. The insurance claim firesetter (7%, $n = 10$) was one of the oldest (median age = 29) and more intelligent of the firesetter groups (median IQ = 110). These individuals set fires to their own unoccupied homes or properties in order to obtain compensatory insurance. The vandalism firesetters (4.1%, $n = 5$) were young males (median age = 18) of low intelligence (median IQ = 75). They were typically accompanied by other firesetters and tended to set fires to schools and churches for "fun". Finally, the crime concealers (7%, $n = 10$) were those who set fires in an attempt to conceal other criminal activity. These individuals were of relatively high intelligence (IQ = 112) with a median age of 22.

A core strength of Inciardi's (1970) work was the number of participants studied. This work appears to have been one of the most extensive attempts at firesetting classification since Lewis and Yarnell's (1951) pioneering study (Rix, 1994). Nevertheless, Inciardi's classification—like Lewis and Yarnell's—suffers from poor conceptual clarity since participants could be classified according to motive (i.e., *revenge*) or demographic characteristics (i.e., residing in a psychiatric facility); see also Vreeland and Levin (1980).

Other typologies similar to Inciardi's (1970) have emerged more recently in the literature (e.g., Dennett, 1980; Icove & Estep, 1987; Ravataheino, 1989). For example, from the viewpoint of a fire investigator, Dennett (1980) argued that six broad categories could be used to group firesetters: *crime concealers*, *financial firesetters*, *destructive/protesting firesetters*, *hero firesetters*, those who set fire to *fulfill a fundamental need* (associated with those suffering from mental disorders) and those who set fires out of *boredom*. The majority of these categories overlap with those suggested by Inciardi apart from hero firesetters; a category that seemingly stems from Dennett's experience as a fire investigator. According to Dennett (1980), these hero firesetters set fires so that they can save the day and become recognized figures in the community. Icove and Estep (1987) examined qualitative data from 1,016 arrest interviews for fire-related offenses in the US. Similarly to Inciardi's (1970) previous work, they also reported finding the motives of *revenge*, *excitement*, *vandalism*, and *crime concealment*. However, two main points of divergence emerged. First, Icove and Estep found much lower levels of revenge motives in their sample (14% versus 58% in Inciardi's sample), and second, they found much higher levels of vandalism (49% versus 4.1% in Inciardi's sample). It is highly likely that the nature of their sample—which included many more juvenile offenders—accounted for much of this reported motivational variation. In support of this, a plethora of studies examining adult firesetters have documented revenge as being a highly prevalent motivating factor (e.g., Koson & Dvoskin, 1982; Hill et al., 1982; O'Sullivan & Kelleher, 1987; Lewis & Yarnell, 1951; Rix, 1994).

Attempts to simplify classificatory systems into dichotomous or tripartite taxonomies have been relatively unsuccessful (Faulk, 1988; Kidd, 1997; Koson & Dvoskin, 1982; Levin 1976; Moll, 1974; Muckley, 1997; Scott, 1974). For example, Levin (1976) divided firesetters according to whether they had set fires alone, in a group, or for profit, thus conflating offense characteristics with offense motivators. Scott (1974) hypothesized that firesetters were either *motivated* or *motiveless*. Unfortunately, however, the logic underpinning this dichotomy appears severely compromised since many fires with apparent motive (e.g.,

revenge fires) were classified by Scott as *motiveless* (Willis, 2004). Kidd (1997) proposed a similar, but seemingly less controversial system, in which motiveless firesetting was classified as incorporating pyromania, psychosis, vandalism, substance misuse, or intellectual deficiency. Nevertheless, whether such reasons for firesetting should really be classified as *motiveless* is questionable, and may represent a semantic contradiction in terms. Faulk (1988) proposed a more intuitively appealing dichotomy based upon whether fire could be seen as (i) a *means to an end* (e.g., for financial gain, crime concealment, revenge, to relieve boredom, to cry for help, to become a hero, to end one's life, or to enhance self esteem) or (ii) the *object of interest in itself* (e.g., due to pyromania type characteristics, sexual excitement, affect regulation). This latter dichotomy—although simple—appears to circumvent the semantic issues inherent in Kidd (1997) and Scott's (1974) classifications providing a core instrumental–intrinsic division (Doley, 2003a). Using a slightly broader conceptualization, Barker (1994) conceptualized firesetting as fitting into one of four types of aggression (see Edmunds, 1978): *Acquisitive* (firesetting directed at innocent persons and property for personal gain), *Vindictive* (firesetting with the intention of harm), *Instrumental* (similarly to Faulk, 1988; firesetting as a means to an end), and *Cathartic* (firesetting as a non-directed release of intense affect).

Prins (1994; Prins et al., 1985) has highlighted the inherent complexity of individuals' motivations for arson; questioning whether any attempt at classifying firesetters' motives contributes greatly to our understanding of firesetting behaviors. Nevertheless, having highlighted these limitations, Prins (1994) proceeds to present a classificatory perspective of firesetting based upon his own previous works (Prins et al., 1985) and that of other researchers (e.g., Cooke & Ide, 1985; Faulk, 1988; Inciardi, 1970; Ravataheino, 1989). Prins (1994) categorizes firesetting as being motivated by either: (i) financial incentive, (ii) crime concealment, (iii) political aims, (iv) self destruction (including political aims), (v) mixed motives, (vi) mental disturbance/disorder, (vii) revenge, (viii) attention seeking, and (ix) vandalism (at the hands of young males). A core strength of this classificatory system is the

inclusion of a category acknowledging the potential for “mixed motives” generating firesetting. In fact, throughout his classificatory descriptions, Prins (1994) openly appreciates the inherent overlap between various classifications (see also Cook & Ide, 1985; Murphy & Clare, 1996). Nevertheless, apart from this open appreciation, it is unclear how Prins’ (1984) taxonomy is notably different from many of the others we have already described.

Rix (1994) attempted to use a combination of categories derived from Inciardi (1970), Faulk (1988), and Prins et al. (1985) to classify the motives of 153 UK firesetters (84% male) referred to psychiatric services between 1983 and 1993. Initially, Rix attempted to use Faulk’s (1988) dual classificatory system of firesetting but was unable to allocate an unspecified proportion of participants using this method. Thus, the resulting classification appeared to amalgamate Inciardi (1970) and Prins et al.’s (1985) classificatory structures, although some notable additions were generated. Overall, fifteen categories were required to account for participants’ motivations³. The three most popular motivators were *Revenge* (33%, $n = 42$), *Excitement* (12%, $n = 16$), and *Vandalism* (10%, $n = 13$). All other categories accounted for $\leq 7\%$ of motives: *Attention-Seeking* (firesetting as a cry for help or to attract attention), *Re-Housing* (firesetting to promote a relocation from social housing), *Attempted Suicide* (firesetting as a means of killing oneself), *Carelessness* (accidental firesetting), *Psychosis* (firesetting as a result of psychotic illness), *Finances* (firesetting in the form of insurance fraud), *Cover up* (firesetting to cover up another crime), *Manipulation* (firesetting to promote relocation to prison/hospital or to reunite with a partner), *Heroism* (firesetting to achieve the community status of “hero”), *Proxy* (firesetting on behalf of someone else), *Antidepressant* (firesetting to relieve depression), and *Political* (firesetting to achieve a political purpose).

A clear strength of Rix’s (1994) study is the fact that he interviewed every single one of his patients face-to-face as part of their psychiatric assessment; and, because persons convicted of arson in the UK are typically assessed by a psychiatrist, Rix’s sample appears fairly representative of north-east England. Nevertheless, Rix does not provide other

³ Only the figures relevant for males are recorded here.

professionals with any clear guidelines regarding how such individuals should be treated, or how each of the motivating factors relate to other key cognitive, affective, volitional, and behavioral factors to generate firesetting.

In summary, the firesetting literature appears to be characterized by a plethora of simplistic classificatory systems all designed to subdivide firesetters according to core motivational characteristics. The frameworks suggested by researchers for subdividing the motivators associated with firesetting behavior range from simplistic dual and tripartite classificatory systems to a more detailed—and sometimes confusing—myriad of systems that contain in excess of eight categories. Nevertheless, some basic convergences have been established. Common factors that appear to motivate firesetting are *revenge* (Inciardi, 1970; Koson & Dvoskin, 1982; O'Sullivan & Kelleher, 1987; Lewis & Yarnell, 1951; Rix, 1994), *vandalism* (Icove & Estepp, 1987), and *excitement* (Icove & Estepp, 1987; Inciardi, 1970). Less commonly identified themes hypothesized to motivate firesetting are: profit, mental illness, crime concealment, political, cry for help, to enhance heroic status, self harm, and suicide. Nevertheless, it is hard to come to any definitive conclusions regarding the prevalence of firesetting motives because researchers do not report inter-rater reliability figures, or generate new—yet overlapping—typological categories making it difficult to compare and contrast general schemes and findings.

Crime Scene Classificatory Systems

A small number of researchers have attempted to extrapolate the core characteristics of the firesetter from crime scene details (Canter & Fritzon, 1998; Douglas, Burgess, Burgess, and Ressler, 1992; Kocsis, 2007; Kocsis, & Cooksey, 2002; Kocsis, Irwin, & Hayes, 1998; Wood, 2000⁴); that is, *Criminal Investigative Analysis* or *profiling*. Collected crime scene details typically include evidence of planning and preparation, choice of ignition methods or fire target, and efforts at identity concealment.

⁴ See also Canter and Larkin (1993) or Edwards and Grace (2006) for geographical profiling associated with firesetting.

One of the earliest attempts at profiling firesetters began with the work of Douglas et al. (1992)—from the Federal Bureau of Investigation—who based their final subtypes of firesetter around the dichotomous factors of *organized* versus *disorganized* firesetting. Unfortunately, however, these researchers did not use any standardized methodological or analytical methods in order to draw their conclusions, limiting the usefulness of their results. A more methodologically sound, and theoretically informed technique has been used by Canter and Fritzon (1998). Canter and Fritzon examined 175 solved cases of UK firesetting for evidence of distinct behaviors indicative of discrete firesetter profiles using a combination of content analysis and multidimensional scaling. As hypothesized, Canter and Fritzon found four main themes characterizing the actions of firesetters that varied according to the apparent *motive* underlying the firesetting (instrumental or expressive) and the *target* of the firesetting behavior (object or person). Extrapolating offender details from information obtained about the crime, or from the crime scene (e.g., use of accelerants, evidence of suicide notes, or previous disputes with the targeted victim), Canter and Fritzon classified firesetters as *instrumental person* (i.e., firesetters who repeatedly targeted know others as a form of revenge, used accelerants, and made threats prior to their attack; $n = 83$), *instrumental object* (i.e., young firesetters who appeared to set fires opportunistically in order to obtain criminal goals; $n = 60$), *expressive person* (i.e., firesetters with some psychiatric history who set fires in their own home to attract attention or as a cry for help; $n = 75$), or *expressive object* (i.e., firesetters with some psychiatric history who repeatedly set fires to various public buildings to satisfy a fascination for fire or to provide emotional comfort; $n = 62$). These same four themes have been validated with adult prisoners (Almond, Duggan, Shine, & Canter, 2005), and juveniles (Santtila, Häkkänen, Alison, & Whyte, 2003). However, research conducted by Kocsis and Cooksey (2002) has suggested four slightly different firesetting configurations associated with adult recidivist Australian firesetters: *thrill*, *anger*, *wanton*, and *sexual* firesetters respectively. The thrill, anger, and wanton subtypes appear to show some similarities to Canter and Fritzon’s expressive object, instrumental person, and instrumental object

subtypes respectively. However, the sexual subtype is more difficult to reconcile with Canter and Fritzon's findings since it refers to individuals whose firesetting appears to have been associated with sexual activity. Nevertheless, Kocsis and Cooksey (2002) suggest that it may reflect a form of emotional relief akin to Canter and Fritzon's expressive object category. Finally, it is unclear why Kocsis and Cooksey did not find evidence for the expressive person subtype, although it may be that such subtypes were underrepresented in their highly recidivistic sample.

A unique feature of profiling studies generally is the unification of crime scene variables with criminal characteristics, in order to provide investigators with some guidance on the type of individual likely to be associated with a particular firesetting incidence. Unfortunately, however, although such information may be helpful for the investigative process, such classification systems hold little additional value for consulting clinicians over and above the taxonomic systems already detailed.

Single Factor Theories

Psychoanalytical theory

One of the earliest explanations of firesetting is associated with Freud (1932) and was later elaborated upon by various other writers (e.g., Gold, 1962; Macht & Mack, 1968). Many psychoanalysts hypothesize that firesetting originates from either a urethral or oral fixated sexual drive. For example, firesetting has often been hypothesized to result from an inherent association between sexual urges and urination such that (i) youngsters are believed to experience enuresis as a result of attempting to extinguish firesetting occurring in dreams, and (ii) firesetting is believed to symbolize repressed sexual urges (Barnett & Spitzer, 1994; Gaynor & Hatcher, 1987; Glancy, Spiers, Pitt, & Dvoskin, 2003; Kaufman, Heims, & Reiser, 1961; Vreelan & Levin, 1980). However, although psychoanalytical theory is an infamous branch of psychology, none of the underlying tenets have been convincingly validated (poor *empirical adequacy*), and, as noted earlier, sexual desires are implicated in very few firesetting cases (see Barnett & Spitzer, 1994). Psychoanalytical theory also fails to unify previously

separate theories or hypotheses to explain firesetting (poor unifying power) and fails to account for other variables that research suggests are implicated in firesetting behavior (e.g., developmental experiences) illustrating poor *explanatory depth* and *external consistency*.

Furthermore, there is no convincing data showing that psychoanalytical therapy leads to sustained reductions in firesetting behavior (further evidence of poor *empirical validity* and impoverished *clinical utility*).

Biological Disorder

Over the past two decades, researchers have focused on the role of biology and neurobiological impairment in order to understand and explain firesetting (see Barnett & Spitzer, 1994; Virkkunen, 1984; Virkkunen, Goldman, Nielsen, & Linnoila, 1995; Virkkunen, Nuutila, Goodwin, & Linnoila, 1987; Virkkunen et al., 1994). The main assertion underlying this perspective is that firesetters—particularly those regarded as impulsive, or who repeatedly fireset—hold neurotransmitter defects in the form of decreased concentrations of cerebrospinal fluid monoamine metabolites (i.e., 5-hydroxyindoleacetic acid; 5-HIAA, and 3-methoxy-4-hydroxyphenylglycol; MHPG). For example, utilizing biochemical examination procedures, Virkkunen et al. (1987) found that repeat firesetters held less 5-HIAA/MHPG concentrations than approximately matched violent offender and non offender comparisons; a relationship seemingly supported in other studies by Virkkunen and colleagues (e.g., Roy, Virkkunen, Guthrie, & Linnoila, 1986; Virkkunen, De Jong, Bartko, & Linnoila, 1989). Furthermore, Virkkunen, De Jong, Bartko, Goodwin, and Linnoila (1989) identified that firesetters who recidivated over a 3 year period (\pm 18 months) were those most likely to hold 5-HIAA abnormalities relative to non-recidivist firesetters. Such findings suggest that it is highly abnormal neurotransmitter defects which, in part, account for the prolonged and impulsive firesetting observed in some individuals.

Interestingly, glucose metabolism abnormalities have also been implemented in firesetting and firesetting recidivism (Roy, et al., 1986; Virkkunen, 1984; Virkkunen, De Jong,

Bartko, Goodwin, & Linnoila, 1989) suggesting that, for some firesetters, blood sugar disturbances may play a causal role in their firesetting behavior.

Finally, a variety of brain and chromosome anomalies have been implicated in firesetting such as impoverished frontal lobe function (Calev, 1995; Friedman & Clayton, 1996), posterior abnormalities (Meinhard, Oozeer, & Cameron, 1988), epilepsy (Carpenter & King, 1989; Mende, 1960), and Klinefelter's or XYY syndrome (Eytan, Paoloni-Giacobino, Thorens, Eugster & Graf, 2002; Kaler, While, & Kruesi, 1989; Nielson, 1970). Nevertheless, such anomalies are not generally well studied, and much of the evidence is either case study-based or subject to methodological problems.

In contrast to the psychoanalytical approach detailed earlier, the biological perspective provides professionals with a relatively simplistic physiological explanation for firesetting that is empirically supported (i.e., evidence of *empirical adequacy*), and offers some promise for rehabilitation depending on the nature of the insult or abnormality (e.g., the provision of serotonergic drugs for offenders with 5-HIAA abnormalities; evidence of *clinical utility*). Nevertheless, cases of firesetting associated *only* with biological causes are rare. Thus, focusing only on the biological factors associated with firesetting is likely to limit professionals' examination of psychological and sociological factors that are also likely to be heavily implicated in firesetting (i.e., poor *explanatory depth* and *unifying power*). Clearly, however, the biological approach to firesetting opens up a number of avenues for future research including examination of the potential link between structural brain impairment and impulsive firesetting behavior (i.e., evidence of *research utility*).

Social Learning Theory

Social learning theorists view firesetting as a manifestation of reinforcement contingencies and learning through modeling or imitation (Bandura, 1976; Kolko & Kazdin, 1986; Macht & Mack, 1968; Singer & Hensley, 2004; Vreeland & Levin, 1980). For example, Vreeland and Levin (1980) argue that firesetting holds instantly reinforcing consequences in the form of (i) the sensory excitement associated with fire, and (ii) the sirens, noise, and

crowds elicited by fire. Vreeland and Levin note that further positive reinforcement may also stem from overt praise elicited from external observers who may mistakenly believe that the firesetter raised the alarm or played a significant effort in fighting the fire. Furthermore, because social learning theory predicts that positive reinforcement is not required to be *directly* experienced in order for learning to occur, learning may occur vicariously via observation. In other words, individuals who are exposed to firesetting (legitimate or illegitimate)—especially throughout their formative years—are hypothesized to be at an increased risk of engaging in firesetting behavior themselves. Interestingly, evidence does suggest that (i) firesetters' fathers hold occupations involving significant exposure to fire (e.g., firemen; Macht & Mack, 1968), (ii) firesetters are raised in environments where fire is more pervasive (e.g., countryside locations; Wolford, 1972) or fire is used as a punishment (Haines, Lambie, & Seymour, 2006; Ritvo, Shanok, & Lewis, 1983), and (iii) firesetters originate from families who hold a history of firesetting (Rice & Harris, 1991).

Social learning theory appears most likely to account for the etiology of revenge or anger-related firesetting (i.e., indirect anger expression; McKerracher & Dacre, 1966). For example, social learning theory predicts that self-regulatory responses are shaped through environmental reinforcement contingencies. Thus, poor childhood socialization characterized by exposure to negative developmental experiences (i.e., perceived failure), and role models may result in aggression, poor coping skills, and lack of assertiveness. These traits are associated characteristics of firesetters (see Associated Traits), and so are likely to increase an individual's propensity to light fires in an attempt to gain positive environmental control (Vreeland & Levin, 1980). Thus, according to social learning theory (see Kolko & Kazdin, 1986), a whole range of developmental experiences, stresses, cues, cognitive perceptions, and expectations contribute to, and shape an individual's tendency towards firesetting behavior; specifically as a form of learned hostility or aggression.

The social learning perspective has played an extremely important role in highlighting the developmental experiences leading to firesetting behaviors, fits well with general

psychological theory (good *external consistency* and *unifying power*), and appears generally supported by studies examining the developmental experiences of firesetters (evidence of *empirical adequacy*). Nevertheless, while social learning theory is able to account for fire interest, and antisocial expressions of aggression or anger, it is not clear which combination of factors culminate to facilitate various other types of firesetting (i.e., poor *explanatory depth*), resulting in a clinical tool that will only be useful in very specific cases (i.e., limited *clinical utility*).

Multi factor Theories

Functional Analysis Theory (Jackson et al., 1987b)

One of the earliest multi factor explanation of firesetting was adopted by Howard Jackson and his colleagues using a functional analysis framework (see Slade, 1982 or Sturmey, 2008 for the underlying principles of functional analysis). Using the overarching tenets of Functional Analysis Theory, the authors present firesetting as a behavior that is facilitated and maintained via a complex interaction of *antecedents* (i.e., previous circumstances and events) and behavioral *consequences* (i.e., reinforcement principles associated with exploratory or deliberate firesetting). Clinical experience with firesetters, preexisting research, and tenets of social learning theory are used by Jackson et al. (1987b) to guide the underlying associative links hypothesized to culminate and reinforce firesetting (see Figure 1). In terms of antecedents, Jackson et al. hypothesize five main factors underlying deliberate firesetting behavior: (1) *psychosocial disadvantage* (e.g., poor caregiver relationships and associated psychological consequences); (2) *life dissatisfaction and self-loathing* (e.g., depression, and self esteem issues stemming from psychosocial disadvantage); (3) *social ineffectiveness* (e.g., impoverished conflict resolution skills and rejection from others); (4) *factors determining the individual's experiences of fire* (e.g., previous vicarious or individual fire experiences), and (5) *internal or external firesetting triggers* (i.e., affective states, or particular contexts that trigger firesetting urges). Jackson et al. contend that firesetting consequences play a significant role in facilitating and maintaining firesetting via strong reinforcement contingencies. For

example, Jackson et al. hypothesize that, for children who experience significant social difficulties, fire, and fire paraphernalia may offer them (i) power, influence, and acceptance from their peers that are ordinarily unobtainable via their limited social repertoire, or (ii) increased attention from distracted or distanced caregivers such that fire interest becomes positively reinforced. Such temporary increases in personal effectiveness and self esteem alongside the potential sensory stimulation of fire thus escalate the individual's interest in fire further, increasing the chances of further antisocial behavior involving firesetting.

Interestingly, Jackson et al. contend that negative reinforcement principles may play an equally important role in the development and maintenance of antisocial firesetting. They cite the common punitive consequences of firesetting (e.g., punishment, rejection, or intense supervision concerning fire-related activities) as potential expedients of personal inadequacies already experienced by the individual that are likely to deeply entrench and further maintain antisocial firesetting.

Many of the core assumptions underlying the theory proposed by Jackson et al. (1987b) are empirically supported. For example, firesetters' experiences of isolation (Hurley & Monahan, 1969), depression (Grant & Kim, 2007), poor self esteem (Tennent et al., 1971), impoverished social skills (Tennent et al., 1971; Rice & Chaplin, 1979) and strong negative affect preceding firesetting (see Murphy & Clare, 1996). Further, the fundamental contingencies hypothesized to facilitate and maintain firesetting behavior are based on the well established principles of conditioning theory which underpin contemporary clinical psychological methods (i.e., strong *external consistency*). Functional Analysis Theory illustrates enormous strengths in unifying isolated findings and hypotheses together into one workable whole (i.e., the unification of the Displaced Aggression Hypothesis with Social Learning Theory). Nevertheless, Jackson et al.'s theory has not been rigorously empirically tested to date, and so *empirical adequacy* of the theory as a working whole is yet to be specifically established. An obvious strength of this model lies in its relevance for clinicians (i.e., *clinical utility* strengths), since it is used to underpin and guide contemporary firesetting treatment

(Swaffer et al. 2001; Taylor, Thorne, Robertson, & Avery, 2002). Clearly, clinicians who work with firesetters require a complex multi factor framework with which to guide their interventions and firesetting assessments, and this is something that cannot be gained from single factor theories. The focus on developmental experiences as a factor potentially explaining interest in, and reinforcement of, firesetting behavior is a clear strength. However, more proximal aspects of the firesetting behavior appear a little less clearly articulated by comparison (e.g., cognitions that support firesetting); illustrating a relative lack of *explanatory depth*.

Dynamic-Behavior Theory (Fineman, 1980, 1995)

Fineman's Dynamic-Behavior Theory of firesetting, to our knowledge, is the only other multi factor theory constructed to explain firesetting. In many respects, it is very similar to Jackson et al.'s (1987b) Functional Analysis Theory, yet intriguingly, Fineman did not acknowledge, nor compare his theory to that of Jackson et al.'s in his pioneering 1995 paper.

Similarly to Functional Analysis Theory, Fineman (1995) viewed firesetting as the product of core historical psychosocial influences that direct and shape an individual's propensity towards firesetting through various early social learning experiences. Drawing upon previous professionals' conceptualizations of firesetting within a dynamic-behavioral framework (i.e., Cook, Hersch, Gaynor, & Roehl, 1989; Gaynor, 1991), Fineman expressed firesetting using the following formula:

$$\text{Firesetting} = G1+G2+E$$

$$\text{Where } [E = C+CF+D1+D2+D3+F1+F2+F3+Rex+Rin]$$

Put simply, the overarching equation stipulates that firesetting is the result of: (*G1*) historical factors that predispose individuals to behave antisocially (i.e., social disadvantage, social ineffectiveness), (*G2*) previous and existing environmental reinforcement contingencies promoting firesetting (e.g., childhood fire experiences, fire fascination) and (*E*) instantaneous environmental reinforcement contingencies promoting firesetting (e.g., external, internal, or

sensory reinforcement). Fineman (1995) unpacks instantaneous environmental reinforcement contingencies (E) into various variables that he believes *must* be explored by any consulting clinician working with firesetters for risk assessment/ intervention purposes. These include (C) impulsivity triggers (e.g., rejection, victimization or trauma), (CF) crime-scene features which may provide valuable clues regarding the *goals* of the firesetting behavior (e.g., was the attack seemingly planned, were specific individuals targeted?), (D1, D2, and D3) cognitions prior to, accompanying, and post firesetting, (F1, F2, and F3) affective states prior to, accompanying, and post firesetting (which, alongside cognitions, may be impacted by substance intoxication). Finally, (R) is used by Fineman to describe any firesetting reinforcers including (R_{ex}); that is, external reinforcements such as financial reward, or law evasion and (R_{in}); that is, internal reinforcements such as satisfaction, recognition, or sensory excitation. Fineman views firesetting as resulting from the complex, and unique interactions between all the above factors and recommends careful evaluation of each of the aforementioned components and their constituent parts in order to assess and treat the firesetter.

Similarly to Functional Analytic Theory (Jackson et al., 1987b), Dynamic-Behavior Theory fits well with the principles of conditioning theory underpinning contemporary clinical psychology (i.e., strong *external consistency*). Dynamic-Behavior Theory also holds significant strengths in the area of *clinical utility* since it provides clinicians with a guiding framework with which to underpin their basic assessments and formulations of firesetting behavior. Most notable, for example, is that Fineman (1995) has developed an assessment grid, which clinicians may use to structure their understanding of the sequence of events leading to, and potentially reinforcing firesetting behavior (i.e., the *Firesetting Sequence Analysis* form). We view such guidance as essential for understanding the offense sequence, and also for teaching firesetters adequate relapse prevention strategies both individually or in groups. Thus, a notable strength of Dynamic-Behavior Theory relative to Functional Analysis Theory is the notable appreciation of firesetting in the form of an offense chain, and the close examination of offense-supportive cognitions at various points in the offense sequence (i.e.,

explanatory depth). Additionally, Fineman presents clinicians with guidance on the assessment of risk according to the goals identified as underlying the firesetting behavior (i.e., further *clinical utility evidence*). Furthermore, akin with Functional Analysis Theory, many of the general tenets or assumptions underlying this theory are relatively established in the firesetting literature (e.g., family variables associated with firesetting; *empirical validity*), although it should be noted that the theory remains untested as a unified whole (problems with overall *empirical adequacy*). Finally, Doley (2009) notes that, although this theory appears able to account for the initiation of firesetting behaviors, it is less clear regarding the exact mechanisms maintaining recidivist firesetting; a feature more adequately explained by Functional Analysis Theory.

Clinical Interventions

Risk Assessment

In terms of current clinical information relating to firesetters' risk factors, there is very little *specific* guidance. Fineman (1995; described earlier) provided clinicians with a fairly comprehensive risk checklist, based on his dynamic-behavioral conceptualization of firesetting. The checklist covers historical events (i.e., fire history), general psychopathology and behavior (e.g., social functioning with peers), characteristics and motivations driving the firesetting, cognitions and affective states associated with the firesetting, substance abuse issues, and notable firesetting reinforcers. Fineman recommends that clinicians use multiple sources to gather the information required to complete the checklist (i.e., interviews with the firesetter, family, and reports from other relevant professionals). The checklist should then be used by the clinician to guide relative judgments regarding risk of future firesetting behavior. Fineman argues that risk of future firesetting will relate to—amongst other things—history of firesetting, severity of psychopathology, the motive and intent to harm underlying the act, and the firesetter's post offense response (i.e., positive or negative). We are not, however, aware of any published empirical research validating the use of this risk assessment tool with adult firesetters. Nevertheless, many of the factors documented by Fineman as risk factors

for firesetting have been implicated in the more substantially developed literature relating to child and juvenile firesetters (e.g., Kolko & Kazdin, 1989a, 1989b; Hanson, MacKay, Atkinson, Staley, & Pignatiello, 1995). Furthermore, Rice and Harris (1996) found that, for mentally disordered adult firesetters, paramount predictors for recidivist firesetting tended to be fire-specific variables (i.e., age of first firesetting incident, overall number of firesetting charges, and childhood firesetting history) over a mean follow up period of 7.8 years. Rice and Harris' study also illustrated that factors predictive of recidivist firesetting were generally different to those predictive of other types of reoffending in the same group of firesetters. In a more recent study, Dickens et al. (in press) examined the key characteristics of UK firesetter recidivists using regression analyses. Amongst other factors, Dickens et al. found that recidivist firesetters could be characterized by factors such as being *young, single*, having a developmental history of *violence* or *substance abuse*, an early onset of *criminal convictions*, lengthier *prison stays*, *relationship problems*, and more *preconvictions for property offences*. Dickens et al. also found that fire severity, as rated by coders, did not predict firesetting recidivism. Put another way, when firesetters were coded as having started a dangerous fire, that was likely to cause significant harm or damage, they appeared no more likely than other firesetters to repeat their firesetting behavior. On first glance, Dickens et al.'s findings appear to suggest that *general criminality* may differentiate recidivists from non recidivists. However, recidivists were no more likely to hold preconvictions for aggression or violent and sexual abuse, suggesting that their criminal interests may lie explicitly with property or fire-related offences. In support of this, Dickens et al. found that more of the recidivist firesetters experienced some sort of excitement or anxiety around the time of their firesetting. These findings suggest that at least one type of risk factor for repeat firesetting in adults relates to *interest in* or *excitement* associated with fire itself. Unfortunately, however, there are no other published studies further examining the predictive ability of various variables in recidivist firesetters, nor studies examining the links between childhood firesetting and later firesetting behavior.

For contemporary clinicians involved in firesetting risk prediction, it is worth noting that the HCR-20 manual for violence risk prediction (Webster, Douglas, Eaves, & Hart, 1997; p25) includes arson as a “less clear” case of violence and recommends that clinicians consider violent behavior according to the obvious likelihood of causing harm to other individuals (cf. VRAG; Quinsey, Harris, Rice, & Cormier, 1998; Rice & Harris, 1995). Clearly, then, firesetting serving the purpose of revenge or with reckless regard regarding others’ safety may be classifiable as violence, although many instances may be unclear regarding underlying motivators. Nevertheless, it is clear that, at present, firesetting is represented in generic assessments of violence as one of the many actions constituting risk for violence more generally rather than risk of firesetting per se. Thus, for consulting clinicians asked to assess firesetters for future risk of recidivism, the issue is complex. If the firesetting appears to stem from intentions relating to violence and/or is embedded within a plethora of other violent criminal actions, the HCR-20 may be used as a structured clinical guide for predicting future violence in the form of *firesetting*, or including firesetting. If, on the other hand, clinicians are required to assess risk of firesetting per se (perhaps in the absence of overtly violent intentions), it would seem reasonable to suggest that professionals devise their own individual assessment of risk using Fineman’s (1995) basic framework as a guide, and paying particular attention to the clinical evaluation of firesetting interests, as well as reinforcing cognitions, and affect. In such cases, clinical interview and use of the *Fire Interest Scale* (Murphy & Clare, 1996) and the *Fire Attitude Scale* (Muckley, 1997) will represent pertinent tools.

Treatment

Although there appear to be numerous firesetter treatment programs and initiatives in use with, and specifically developed for child and adolescent firesetters (Adler, Nunn, Northam, Lebnan, & Ross, 1994; Bumpass, Brix, & Preston, 1985; Kolko, 2001, 2002; McGrath, Marshall, & Prior, 1979; Muller & Stebbins, 2007; Nishi-Strattner, 2003; Schwartzman, et al., 1998; Webb, Sakheim, Towns-Miranda, & Wagner, 1990), there are very

few similar initiatives reported with adult firesetters. For example, there are currently no standardized treatments for firesetters in the UK (see Palmer, Caulfield, & Hollin, 2005, 2007), US (M. Rice, personal communication, March 17, 2009), or Australasia (K. Fritzon, personal communication, March 23, 2009). It is unclear exactly *why* this is the case. However, this state of affairs appears to have been facilitated and maintained via our lack of knowledge concerning adult firesetters' risk factors and "What Works" with this population (Palmer, Hollin, Hatcher, & Ayres, in press). Furthermore, given the wide range of offenses committed by adult firesetters, it is intuitively appealing to presume that firesetters' needs are adequately met though myriad offending behavior programs designed for generic offending populations (e.g., assertiveness and social skills training).

As other professionals have recently noted (Palmer et al., 2005), the adult interventions that have been documented for firesetters are typically cognitive behavioral and implemented in psychiatric settings (e.g., Smith & Short, 1995; Swaffer et al., 2001; Taylor et al., 2002; Taylor, Thorne, & Slavkin, 2004), although there are some reports of behavioral aversion therapy (Royer, Flynn, & Osadca, 1971) and social skills treatment (Rice & Chaplin, 1979). Furthermore, it is somewhat unsurprising to note that many reported treatment efforts are susceptible to much variation (see Haines et al., 2006 or Palmer et al., 2007). The danger with this, of course, is that professionals worldwide approach the treatment of firesetting in vastly different ways according to their own understanding of the extremely scant research evidence and theoretical perspectives most of which are based on aged evidence gained from psychiatric populations. Nevertheless, there are some extremely admirable treatment efforts that have been documented in the research literature.

Swaffer et al. (2001) described their group-based firesetting intervention program for UK mentally disordered patients comprising of 62 group sessions covering (1) education regarding fire danger, (2) coping skills (including social skills, assertiveness, conflict resolution, problem solving), (3) reflective insight (including self esteem and self concept work), and (4) relapse prevention. Unfortunately, however, although Swaffer et al. describe a

detailed case study outlining the apparent effectiveness of the program, and describe the package of assessments utilized to assess progress on the program, they do not report any data on clinical change.

Taylor et al. (2002) described a group-based intervention program for UK intellectually disabled patients ($n = 14$) comprising of 40 group sessions covering education regarding fire, analysis of offending, coping skills, family problems, and relapse management. Taylor et al. reported statistically significant improvements on measures assessing attitudes towards fire and fire interest (*Fire Attitude Scale*; Muckley, 1997 and *Fire Interest Scale*; Murphy & Clare, 1996 respectively), understanding of victim issues, risk, and emotional expression (*Goal Attainment Scales*; Milne & Learmonth, 1991), anger (*Novaco Anger Scale*; Novaco, 1994), and self esteem (*Culture Free Self Esteem Inventory*; Battle, 1992). It is unclear, however, whether these improvements were *clinically* significant, and the authors themselves note their study lacks adequate control group comparisons. In a later paper, Taylor et al. (2004) describe detailed case studies of four intellectually disabled male patients who completed a similar program. The authors report somewhat positive outcomes for each of the studied patients, who attended the majority of the program. However, the sample size was simply too small to draw any meaningful conclusions from the measures used to examine post treatment improvement.

A particularly interesting case study has been described by Clare, Murphy, Cox, and Chaplin (1992). They describe the case of P.R.; an intellectually disabled 23 year old male who set a series of fires in order to reduce negative affect and gain attention. The patient was individually treated using cognitive behavioral therapy including social skills, assertiveness, adapted covert sensitization, relaxation exercises, coping skills, and graded exposure. P.R. also received surgery for a cleft palate. Clare et al. report no firesetting recidivism over a 30 month follow up period following hospital discharge and P.R. reported coping successfully with urges to set fires.

At present, therefore, not only are published reports of clinical interventions with adult firesetters' scarce, but reports of the effectiveness of programs are practically non-existent. It is essential then, that professionals consider wide dissemination of their practice with adult firesetters, alongside substantial follow-up efficacy studies comprising adequately matched control groups and follow up periods. Such studies are vital for useful inquiries into "What Works" for firesetters, and may even prompt more comprehensive treatment efficacy studies that compare the effectiveness of various treatment programs for firesetters (e.g., generic offending behavior programs versus more specific firesetting programs).

There are various possibilities available for developing treatment aimed at firesetters. An examination of general offending treatment programs shown to be effective in reducing recidivism, highlights three main principles of paramount importance: Risk, Need, and Responsivity (Andrews & Bonta, 2003). The *Risk* principle is concerned with ensuring that those offenders deemed to be of higher risk for reoffending are provided with more intensive treatment. The *Need* principle contends that treatment interventions should pinpoint offenders' criminogenic needs (i.e., dynamic risk factors empirically related to offending). Finally, the *Responsivity* principle is concerned with ensuring that the intervention program is an adequate match for the recipient populations' personal identity, learning styles, skills and abilities (Andrews & Bonta, 2003).

In terms of the risk principle, it appears that, although there are myriad instruments available for assessing risk of violence *generally*, very little is available to guide consulting clinicians regarding what factors would indicate a *high* risk of adult firesetting. Further studies examining the relationships between various historical and clinical factors with future risk of firesetting relative to future risk of generally violent offending would be extremely useful for this purpose. A further particularly important requirement is for professionals to increase their current understanding of how firesetting and non-firesetting criminogenic needs are related in firesetters. Empirical evidence shows that firesetters evidence myriad criminal behaviors that are not dissimilar to either property or violent offenders. In this sense then, it

is easy to see why corrections establishments have currently chosen to treat firesetters via more generalist intervention programs rather than via specific firesetting programs (e.g., HM Prison Service, UK; Palmer et al. 2007). Yet, we believe that for individuals who use fire repetitively as part of a wider array of criminal acts, or for whom firesetting has become part of their personal identity, generic offending behavior programs may not prove to be the most effective treatment that we are able to provide. This is especially relevant given the research evidence suggesting that firesetting is predicted by fire-relevant variables such as fire interest or age of first firesetting incident (Kolko, Herschell, & Scharf, 2006; Rice & Harris, 1996) rather than more generic offending variables (Rice & Harris, 1996).

It would seem reasonable to suggest that repetitive firesetters may benefit from the development of standardized, specific offending behavior programs that focus both on fire factors (i.e., early socialization with fire, fire interest/ reinforcement, fire as part of self identity, attitudes supporting antisocial behavior with fire, fire education), but also more general treatment needs hypothesized to be associated with firesetting and violent and non-violent offending generally (e.g., social skills and assertiveness training, self-esteem, problem solving, and coping skills). Furthermore, it is likely that some firesetters, who show relatively high fire interest, and experience significant physiological reinforcement from firesetting, may benefit from more behavioral covert sensitization, or minimal *physiological* arousal conditioning. Such techniques are designed to re-associate the pleasant physiological experience of fire with unpleasant imagined consequences, and aversive stimuli. Successful covert sensitization procedures have been reported as resulting in positive consequences, for child and adult firesetters (Clare et al., 1992; McGrath et al., 1979). Nevertheless, these studies are typically case study-based, or lack methodological rigor (i.e., lack control groups or adequate follow up periods), highlighting an exceptional gap in the adult firesetting intervention literature and the empirical underpinnings of this literature. We find it curious that professionals have not deemed the issue of firesetting unique enough to warrant separate intervention and recidivist study. Certainly, base rates of reoffenses for *firesetting* are low

(approximately 16%, Rice & Harris, 1996), but these are not exceptionally different to the base rates of sexual offending (cf. 16.8%; Hanson et al., 2002). Sexual offenders also hold generalist offense histories (Gannon et al., 2008), and yet many specialist standardized programs are available for sexual offenders. We are certainly not suggesting that firesetting programs focus *only* on offenses related to fire. Instead, it may be beneficial for firesetters to construct offense chains, not only for their firesetting behaviors, but also for other offending behaviors so that they can make sense of the patterns of behaviors underlying their offending behavior. Such interventions would enable firesetters to develop strong and unified relapse prevention plans that target both their firesetting behavior and also their other offending.

The above mentioned suggestions are associated with firesetters' hypothesized treatment *needs*. However, they also relate strongly to the responsivity issues that are likely to be associated with firesetters. Research suggests that adult firesetters desire early interventions that *specifically* focus on firesetting behavior, and the underlying motivators of firesetting (Haines et al., 2006). In other words, firesetters feel that more focused firesetting interventions fit with their personal identify as offenders. Clearly, such perceptions are vital for group process issues since offenders who perceive their treatments as personally relevant will be more likely to engage with and benefit from such treatments. In relation to other responsivity issues (e.g., learning styles, skills and abilities), it is vital that clinicians ensure that their newly developed programs fit with these group attributes, or at least provide flexible individual sessions alongside the group to ensure that treatment materials are adequately tailored for each individual's skills and abilities.

Future Directions and Conclusions

The firesetting field appears to hold a whole host of exciting possibilities for future advancement of both etiological and practical knowledge. Here, we outline what we believe are the most significant problems in this area and make suggestions for future advancements to the field.

Our review has highlighted that the vast majority of empirical work undertaken with firesetters has focused on the proliferation of typological classificatory systems or the examination of firesetters' psychopathological and sociodemographical features. While such information is useful for gaining a basic understanding of the variety of motives underlying firesetting behavior, this information provides professionals with little guiding etiological theory for use in therapy.

Further, in examining the literature on adult firesetters, we have highlighted the fact that firesetters are typically treated using generic offending behavior programs since they often commit a wide array of either violent or property crimes. This is not to say that firesetters do not benefit from such generalist programs. However, we believe that there is significant scope for further investigating and evaluating the treatment needs of firesetters. Clearly, it may be time for professionals to begin investigating the wider treatment possibilities that exist for firesetters and develop existing theory governing this area. Adult firesetters cause significant injury, death, and property destruction and so require adequate evidence-based treatment from clinicians entrusted with their rehabilitation. For these professionals, especially those based in correctional institutions, this task creates significant problems given the current state of knowledge in this field. For example, existing research examining the developmental backgrounds and attachment styles of firesetters is very poor, as too is our knowledge of the neurological features, cognitions, and affective patterns associated with firesetting behavior.

We have documented a very small number of single factor and multi factorial theories used to explain firesetting. However, the single factor theories are unable to explain the myriad of features typically interacting to facilitate and maintain firesetting, and the multi factor theories are relatively dated. Given the amount of theory proliferation in other arenas of forensic psychology (e.g., sexual offending, violence), it is extraordinary that professionals have not yet attempted to generate a multi factor theory to fill this gap. Some of the research evidence that we have documented suggests firesetters are most likely to be generalists (e.g.,

Rice & Harris 1996). Thus, we believe that professionals may benefit substantially from further developing theory that is able to account for such myriad behaviors. Furthermore, other forensic research arenas have paid specific attention to developing micro level theories that examine sexual or violent offenders' offense styles in order to improve the clinician's ability to provide evidence-based relapse prevention work for these populations (see Ward, Louden, Hudson, & Marshall, 1995 or Gannon, Rose, & Ward, 2008). The development of such theory in relation to firesetters would not only provide evidence vital for examining the firesetting and non firesetting offense overlap, but would substantially develop and inform rehabilitatory work with firesetters.

Finally, our examination of the research evidence relating to firesetters has highlighted that there is an urgent requirement for researchers and clinical professionals to further develop their current understanding of the treatment needs of firesetters and the overlap of these needs with the general offending population. Our current understanding of this field is developmentally stunted and requires significant re-generation if we are to begin understanding the treatment needs and requirements of firesetters. At present, there is no standardized best practice with firesetters. It is unlikely that we would ever dare inform a sexual offender that his needs would be adequately met via myriad general offending behavior programs. Thus, we urge professionals to think about the careful construction of research programs and offending behavior programs to address the significant gaps in the firesetting arena that we have highlighted.

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