

Please cite as: Gannon, T. A., Alleyne, E., Butler, H., Danby, H., Kapoor, A., Lovell, T. ... & Ó Ciardha, C. (2015). Specialist group therapy for psychological factors associated with firesetting: Evidence of a treatment effect from a non-randomised trial with prisoners. *Behaviour Research and Therapy*, 73, 42-51.

Specialist Group Therapy for Psychological Factors Associated with Firesetting: Evidence of  
a Treatment Effect from a Non-Randomized Trial with Male Prisoners

Theresa A. Gannon, Emma Alleyne, Helen Butler, Harriet Danby, Aparna Kapoor, Tamsin  
Lovell, Katarina Mozova, Elizabeth Spruin, Tracey Tostevin, Nichola Tyler

and

Caoilte Ó Ciardha

University of Kent, UK

Author Note

Theresa A. Gannon, Emma Alleyne, Helen Butler, Harriet Danby, Aparna Kapoor, Tamsin  
Lovell, Elizabeth Spruin, Tracey Tostevin, Nichola Tyler, Katarina Mozova, Caoilte Ó  
Ciardha, Centre of Research and Education in Forensic Psychology, School of Psychology,  
Keynes College, University of Kent, Canterbury, Kent, England.

This research was supported by an Economic and Social Research Council grant  
awarded to Theresa A. Gannon (RES-062-23-2522). We are grateful to area psychologists,  
prison establishment staff, Kent Fire and Rescue Service, our participants, and two  
anonymous reviewers who made very constructive suggestions on a previous version of this  
manuscript. The views expressed are those of the authors and do not necessarily reflect those  
of National Offender Management Services.

Correspondence concerning this article should be addressed to Theresa A. Gannon,  
Centre of Research and Education in Forensic Psychology, School of Psychology, Keynes

Please cite as: Gannon, T. A., Alleyne, E., Butler, H., Danby, H., Kapoor, A., Lovell, T. ... & Ó Ciardha, C. (2015). Specialist group therapy for psychological factors associated with firesetting: Evidence of a treatment effect from a non-randomised trial with prisoners. *Behaviour Research and Therapy*, 73, 42-51.

College, University of Kent, Canterbury, Kent, CT2 7NP, England. E-mail:

T.A.Gannon@Kent.ac.uk

## Abstract

Despite huge societal costs associated with firesetting, no standardized therapy has been developed to address this hugely damaging behavior. This study reports the evaluation of the first standardized CBT group designed specifically to target deliberate firesetting in male prisoners (the Firesetting Intervention Programme for Prisoners; FIPP). Fifty-four male prisoners who had set a deliberate fire were referred for FIPP treatment by their prison establishment and psychologically assessed at baseline, immediately post treatment, and three-months post treatment. Prisoners who were treatment eligible yet resided at prison establishments not identified for FIPP treatment were recruited as Treatment as Usual controls and tested at equivalent time-points. Results showed that FIPP participants improved on one of three primary outcomes (i.e., problematic fire interest and associations with fire), and made some improvement on secondary outcomes (i.e., attitudes towards violence and antisocial attitudes) post treatment relative to controls. Most notable gains were made on the primary outcome of fire interest and associations with fire and individuals who gained in this area tended to self-report more serious firesetting behavior. FIPP participants maintained all key improvements at three-month follow up. These outcomes suggest that CBT should be targeted at those holding the most serious firesetting history.

**Keywords:** Firesetting, Offender, Cognitive Behavioral Therapy, Group Treatment.

## Specialist Group Therapy for Psychological Factors Associated with Firesetting: Evidence of a Treatment Effect from a Non-Randomized Trial with Male Prisoners

Deliberate firesetting is a societal problem of vast proportions. Latest available statistics show that between 2007 and 2011, US fire departments received annual reports of approximately 282,600 deliberate fires which were responsible for 1,360 casualties, 420 deaths, and \$1.3 billion USD costs in property damage (Campbell, 2014). These latter property costs represent only a small amount of those incurred since they do not include some of the wider costs associated with firesetting (firefighting, or health costs or costs associated with wildfire damage). In the UK, there were 53,000 deliberately set fires and 451 fire-related deaths in 2008 (Department of Communities and Local Government, 2010) with estimated costs to the total economy in 2004 of £2.53 billion (Office of the Deputy Prime Minister, 2006). In Australia there is no centralized database documenting recorded incidents of deliberate firesetting. However, Rowlings (2008) has estimated that total costs associated with reports of arson in Australia in 2005 are in the region of \$1.62 billion AUD. Yet despite the huge human and economic costs associated with deliberate firesetting, no standardized therapy programs are available for individuals who present with this hugely destructive behavior. Compared with other offending behaviors such as sexual offending and violence, empirical research examining deliberate firesetting is embryonic. To date, there are no established assessments available for assessing risk of deliberate firesetting and no convincing evidence of ‘What Works’ to reduce deliberate firesetting behavior (Fritzon, Doley, & Clark, 2013; Gannon & Pina, 2010; Palmer, Caulfield, & Hollin, 2007).

Lack of research in this area appears to have stemmed from a long-standing assumption that deliberate firesetters are psychological ‘generalists’ who do not require specialist assessment or treatment. However, according to the only study to have adequately tested this hypothesis, deliberate male firesetters are psychologically unique offenders who—

relative to other matched offenders—exhibit higher levels of problematic association with fire (e.g., serious fire interest and identification with fire), anger related cognition, external locus of control, and hold lower levels of general self esteem (Gannon, Ó Ciardha, Barnoux, Tyler, Mozova, & Alleyne, 2013). On the basis of these findings, and those of other contemporary professionals examining allied areas of firesetting specificity (Ducat, McEwan, & Ogloff, 2015), professionals are now recognizing the need to establish assessment and treatment strategies for this neglected group. Fritzson et al. (2013), for example, argue that a more standardized evidence-based approach needs to be taken in devising and implementing treatment with firesetters. Towards this aim, researchers have recently begun to scrutinize how firesetters might best be assessed on fire-related variables (Ó Ciardha, Barnoux, Tyler, Mozova, & Gannon, 2015) and have developed an empirically informed theoretical framework examining the development and maintenance of firesetting (i.e., the Multi-Trajectory Theory of Adult Firesetting [M-TTAF]; Gannon, Ó Ciardha, Doley, & Alleyne, 2012). The M-TTAF emphasizes the interaction of biological, social-cultural, and contextual factors associated with firesetting and emphasizes the importance of examining inappropriate fire interest and associated cognitions (see Fritzson et al., 2013; Gannon et al., 2012).

Over the past two decades, a small number of cognitive behavioral treatment packages (CBT) have been developed for use with mentally disordered firesetters (Hall, 1995; Swaffer, Hagget, & Oxley, 2001; Taylor, Thorne, Robertson, & Avery, 2002; Taylor, Robertson, Thorne, Belshaw, & Watson, 2006). However, these represent uncontrolled ‘in house’ therapy conducted with very small numbers of participants. In the largest study available ( $N = 14$ ), Taylor et al. (2002) reported that a 40-session package of group CBT aimed primarily at reducing problematic fire interest and attitudes in patients with a learning disability led to significant improvements on standardized measures of fire interest and attitudes, anger, goal attainment (e.g., understanding of risk), and self esteem. In the absence

of any control group, however, the beneficial effect of this group therapy remains largely unclear. To our knowledge, no further firesetting treatment evaluation studies have been published. Furthermore, no treatment evaluation studies in prison settings have ever been reported. The current study aimed to provide the first evaluation of a specialist group therapy trial for male firesetters in a UK prison. The therapy evaluated differs from previous ‘in house’ therapies since it was designed for implementation in any UK prison, and was associated with a standardized CBT manual and training for all staff.

CBT has been established as most effective for addressing criminal behaviors (Lipsey, Chapman, & Landenberger, 2001). Meta-analyses, in particular, have highlighted the effectiveness of CBT in addressing sexual offending (Lösel & Schumucker, 2005; Walker, McGovern, Poey, & Otis, 2005), as well as generalist offending involving property or violent misdemeanors (Landenberger & Lipsey, 2005; Pearson, Lipton, Cleland, & Yee, 2002; Redondo, Sánchez-Meca, & Garrido, 1999). CBT allows individuals to challenge and restructure thoughts and attitudes associated with their offending, recognize and appropriately respond to the range of triggers associated with their offending, and practice newly developed competencies and skills aimed at promoting a pro-social lifestyle (Milkman & Wanberg, 2007). In addition, CBT allows individuals to engage in behavioral reconditioning designed to decrease problematic behaviorally learnt associations that result in criminal behavior (Jennings & Deming, 2013). Empirical research examining sexual offending shows that the most effective treatments produce changes not only for inappropriate sexual interests and behavior but also for secondary treatment targets such as emotional regulation and social skills training (Hanson et al., 2002).

The specialist group therapy evaluated in the current study—the Firesetting Intervention Programme for Prisoners (FIPP; Gannon, 2012)—was developed from latest theory and empirical research with male firesetters (e.g., Dickens, Sugarman, & Gannon,

2012; Doley, Fritzson, & Clark, 2013; Gannon et al., 2013; Gannon et al., 2012; Gannon & Pina, 2010). The resulting program consists of 28 weekly 2-hour group sessions as well as a weekly individual support session of up to one hour in length. The FIPP targets four key components empirically associated with firesetting behavior: *Fire-Related Factors*, *Offense-Supportive Cognition*, *Emotional Regulation*, and *Social Competence*. In terms of fire-related factors the FIPP targets problematic interests and associations with fire, teaches fire safety and prevention, and aids clients to develop the skills to understand their own firesetting and how to prevent future firesetting relapse. In terms of offense-supportive cognition, the FIPP aims to cognitively restructure attitudes supporting violence, entitlement, and antisocial behavior. Regarding emotional regulation, clients are encouraged to examine the role of anger arousal, cognition, and provocation tolerance in the lead up to their offending. They are also encouraged to develop effective strategies for regulating anger (e.g., relaxation techniques, cognitive restructuring), in order to improve their perceived self-regulatory control (i.e., a more internalized locus of control). Finally, the FIPP aims to improve social competence through psychoeducation and experiential exercises associated with assertiveness, relationships, and general self-esteem. A key focus of the program is to enable clients to become more aware of the factors associated with their firesetting and to support the development of personalized coping skills to deal with similar factors in the future (i.e., within prison or the community). Throughout treatment, clients are requested to complete out-of-group exercises documenting their childhood experiences with fire, current thoughts and feelings about fire, general coping strategies and thought patterns, as well as a written account of the factors leading up to their firesetting offense(s). Clients share written accounts within the group and are encouraged to receive feedback from group members and facilitators to challenge distorted cognitions associated with their firesetting and develop a realistic picture of the factors associated with firesetting behavior. In terms of skill generation, clients

are encouraged to practice and document their use of new skills (e.g., coping, assertiveness) within the prison setting. Conditioning principles in the form of covert satiation (i.e., repeatedly pairing a client's fire excitement with more negative and emotionally salient consequences) are also used with clients to reduce problematic affiliation with fire. Finally, fire safety officers visit the program to deliver sessions on fire safety practices.

Previous research with firesetters (Gannon et al., 2013) shows that Fire variables effectively discriminate firesetting and non-firesetting prisoners with the largest effect sizes when compared with non-fire variables. Thus, we conducted our treatment evaluation focusing on Fire variables (i.e., fire interest, attitudes, and affiliation with fire) as the primary outcome. Specifically, we predicted that firesetters attending the specialist FIPP would show significant improvement on these variables at treatment completion which would be maintained at three-month follow up. We predicted that this improvement would not be apparent in firesetters who were simply engaging in treatment as usual (i.e., receiving no treatment targeting their firesetting behavior). We included as secondary outcome measures variables that theory and research indicated were likely to facilitate and maintain firesetting behavior in unison with primary motivators such as Fire variables: Offense-Supportive Cognition, Emotional Regulation, and Social Competence. Again, we predicted that firesetters attending FIPP would demonstrate significant improvement across these variables which would be maintained at three-month follow up. We examined both statistical significance as well as indicators of reliable change. Given that this represents the first study of its kind, we also examined possible predictors of treatment response.



## **Method**

### **Design**

This study represents a non-randomized trial of specialist group firesetting treatment versus Treatment as Usual (TAU) for deliberate firesetting. The study was undertaken over 24 months at 7 medium secure prison establishments (2 treatment sites in the South of England and 5 TAU sites located in South England [3], North England [1] and Wales [1]). Medium security prisons are closed prisons that house prisoners whose escape should be made difficult yet are not deemed to require top-level security (Ministry of Justice, 2013). For the specialist group firesetting treatment, Offender Supervisors across 20 medium secure prisons located widely across England were invited to refer eligible participants. If participants did not already reside at one of the two treatment sites, they were transferred for assessment purposes. The five TAU prisons were selected to match treatment prisons on security category. Individuals residing at these prisons who were eligible participants for the specialist treatment were approached by the researchers for research inclusion as a TAU group member.

### **Participants**

Incarcerated firesetters were recruited from UK prisons. To be eligible for the study, participants had to be male adults (i.e.,  $\geq 18$  years) and to have set at least one deliberate fire that was either recorded in prison files or in their conviction history. All participants were required to comprehend and speak English sufficiently to read and understand questionnaires. Participants experiencing active mania, psychosis, suicidal ideation, or at risk of hostage taking were excluded. No incentives were provided to partake in the study.

### **Treatment Implementation/Integrity**

In total, nine FIPP groups were run and completed at two prison establishments in the South of England. Each group contained between four and ten clients. Two facilitators ran

groups; one registered psychologist who held a minimum of five years unsupervised practice experience and one psychology assistant who held a postgraduate qualification in forensic/clinical psychology. Psychologists delivering the FIPP were trained in principles of offender rehabilitation, Evidence Based Practice, and the FIPP by the lead author. Clinical supervision was provided monthly by a registered psychologist and was offered more regularly as required. To maximize facilitator adherence to the FIPP, the lead author observed 5% of group sessions and gave detailed feedback to facilitators. Clients attending the FIPP were informed that if they missed five or more treatment sessions they would be excluded from treatment.

## **Measures**

All measures were presented in a randomized order to participants except the demographic measure which was always presented first. Where possible, simplified or shortened versions of measures were chosen to heighten measure validity for our prison sample and minimize fatigue. Measures were administered face to face. We report reliabilities according to the following criteria (George & Mallery, 2003):  $\geq .90$  excellent,  $.89$  to  $\geq .80$  good,  $.79$  to  $\geq .70$  acceptable, and  $.69$  to  $.60$  marginal.

### **Demographic Measure**

Demographic information about ethnicity, formal education, offense history, and therapy history was collected using a questionnaire developed by the first and final authors.

### **Primary Outcome Measures**

**Fire-Related Measures.** The *Five Factor Fire Scale* (Ó Ciardha et al., 2015)—hereafter referred to as *The Fire Factor Scale*—combines items from the *Fire Interest Rating Scale* (Murphy & Clare, 1996), *Fire Attitude Scale* (Muckley, 1997), and *Identification with Fire Questionnaire* (Gannon, Ó Ciardha, & Barnoux, 2011). Factor analysis (Ó Ciardha et al., 2015) has indicated that five subscales can be empirically determined from this combination

of measures: (a) identification with fire (“Fire is almost part of my personality”), (b) serious fire interest (“Watching a house burn down”), (c) perceived fire safety awareness (“I know a lot about how to prevent fires”), (d) everyday fire interest (“Watching a bonfire outdoors, like on bonfire night”), and (e) firesetting as normal (“Most people have set a few small fires just for fun”). However, everyday fire interest does not usefully discriminate firesetters from non-firesetting controls (Gannon et al., 2013; Ó Ciardha, Gannon, & Tyler, 2014) and so a total score of four factors omitting everyday fire interest has been devised (Ó Ciardha et al., 2015). This total score reflects an individual’s overall fire interest, attitudes, and affiliation to fire with higher scores indicating problems in this area. Ó Ciardha et al. have reported excellent measure reliability ( $\alpha = .90$ ) for the Fire Factor Total Score with male prisoners. The present study showed good internal and acceptable test-retest reliabilities (see Table 2).

The *Relapse Prevention Questionnaire* (Beckett, Fisher, Mann, & Thornton, 1998) was originally devised for use with sexual offenders and examines *risk awareness* (i.e., the range of factors associated with increased risk of offending) and *risk strategies* (i.e., awareness of the range of strategies that could be used to cope with risk factors should they occur; using open ended questions (e.g., “In what situations are you most likely to offend?” and “How would you cope if you were in the same situations in the future?”). Client responses to each question are recorded verbatim and scored according to a predefined content checklist to produce an overall score of risk awareness and risk strategies. With permission from the test author, an adapted version of the questionnaire was created for use with firesetters (e.g., “In what situations are you most likely to set a fire?”) along with an adapted scoring spreadsheet. This adapted Fire Relapse Prevention Questionnaire (Beckett, Fisher, Mann, Thornton, & Gannon, 2011) assesses awareness of firesetting risk (where maximum awareness is 18) and awareness of strategies for dealing with firesetting risk (where maximum awareness is 14). No psychometric properties have previously been

reported for this adapted scale. In the present study internal reliability was good. However, test-retest reliability was poor (see Table 2).

## **Secondary Outcome Measures**

**Offense-Supportive Cognition Measures.** *The Measure of Criminal Attitudes and Associates-Part B* (MCAA-Part B; Mills & Kroner, 1999) is a 46 item self-report measure of antisocial attitudes examining (a) violence (“It’s understandable to hit someone who insults you”), (b) entitlement (“Taking what is owed you is not really stealing”), (c) antisocial intent (“I could see myself lying to the police”), and (d) associates (“Most of my friends don’t have criminal records”). Respondents are asked to agree or disagree with each item. The psychometric properties of the MCAA-Part B—including internal consistency and test-retest reliability—are well established with forensic populations (see Gannon et al. 2013; Mills, Kroner, & Forth, 2002; Mills, Kroner, & Hemmati, 2004). We removed the associates subscale for the purpose of our current study due to unacceptably low levels of internal reliability. Internal reliability for the other subscales ranged from marginal to excellent and test-retest reliability ranged from adequate to good (see Table 2).

**Emotional Regulation Measures.** *The Novaco Anger Scale and Provocation Inventory* (NAS-PI; Novaco, 2003) are two related, yet separate, self-report measures. The NAS (60 items) examines anger experiences across the four domains of cognition (e.g., rumination), arousal (e.g., somatic experiences), behavior (e.g., verbal aggression), and anger regulation (e.g., regulation of angry thoughts) rated using three response options (never, sometimes, or always true). In the current study Total NAS scores (i.e., across the three domains of cognition, arousal, and behavior) were used to indicate anger inclinations and the anger regulation subscale (NAS-REG) was used as an indicator of effective anger coping mechanisms. The PI (25 items) measures an individual’s ability to tolerate general provocation on a 4-point Likert scale (1 = not at all angry, 4 = very angry). The NAS-PI has

well-established psychometric properties when tested with forensic and non-forensic samples (see Culhane & Morera, 2010; Gannon et al., 2013; Novaco, 2003 for internal consistency and test-retest reliability). Good to excellent internal reliabilities were evidenced in our current study along with marginal to good test-retest reliabilities (see Table 2).

*The Nowicki-Strickland Locus of Control* (Nowicki, 1976) is a 40-item self-report measure of an individual's perception of their internal versus external control over events (e.g., "Are some people just born lucky?") rated using a yes/ no response format. This measure examined clients' perceived self-regulatory control (i.e., a more internalized locus of control would indicate a higher level of perceived self-regulatory control). Acceptable psychometric properties of the scale have been established with forensic (Gannon et al., 2013) and non-forensic samples (Nowicki & Duke, 1974). Our study showed acceptable internal reliability (KR20 = .78) and marginal test-retest reliability ( $r = .62$ ).

**Social Competence Measures.** *The Revised UCLA Loneliness Scale* (Russell, Peplau, & Cutrona, 1980) is a 20-item self-report measure of emotional loneliness (e.g., "I lack companionship") rated on a 4-point scale (1 = never, 4 = often). Good psychometric properties have been established by the scale authors and external researchers (Horowitz, Rosenberg, Baer, Ureño, & Villaseñor, 1988; i.e.,  $\alpha = .92$ ; test-retest reliability = .86) and good measure reliability has been evidenced with male prisoners (Gannon et al., 2013). Excellent internal reliability was evidenced in our current study ( $\alpha = .90$ ) alongside marginal test-retest reliability ( $r = .64$ ).

*The Simple Rathus Assertiveness Schedule—Short Form* (Jenerette & Dixon, 2010) is a simplified 19-item self-report measure of assertiveness across a variety of social situations (e.g., "To be honest, people often get the better of me") rated on a 6-point scale (1 = very much unlike me, 6 = very much like me). The authors of the measure report good internal

reliability which was also evidenced in Gannon et al.'s study with male prisoners and in the current study ( $\alpha = .81$ ) alongside adequate test-retest reliability ( $r = .74$ ).

*The Culture-Free Self-Esteem Inventory (2) - General Subscale* (Battle, 1992)

measures general adult self-esteem (e.g., "Are you lacking in self-confidence?") across 20 self-report items using a yes/no response format. The psychometric properties of this measure are well established (see Battle, 1997), internal reliability was good in Gannon et al.'s study with male prisoners and were also good in our current study ( $KR20 = .85$ ) although test-retest reliability was low.

**Impression Management.** The *Impression Management Scale* (IM) of the Balanced Inventory of Desirable Responding (BIDR6; Paulhus, 1991) is a 20-item self-report measure of intentional fake good responses (e.g., "I never swear") rated on a 7-point scale (1 = not true, 7 = very true). Continuous rather than dichotomous scoring of the scale was used (Paulhus, 1994; Stöber, Dette, & Musch, 2002). The IM has well-established psychometric properties within offending populations (Gannon et al., 2013; Lanyon & Carle, 2007; Paulhus, 1991). In our current study, internal and test-retest reliabilities were acceptable (see Table 2).

Each test was scored by an electronic algorithm after being inputted onto a database devised by the last author for this study. This database was designed to maximize accuracy through automatically checking for errors of data input and alerting the inputter of any key stroke errors.

## **Procedure**

The study was approved ethically by the University Research Ethics Committee (REF 20101507) and reviewed by the National Offender Management Service Research Committee (REF 74-10). Prisoners were assessed face to face (lasting approximately 60 minutes) to

maximize validity of self-report responding. To ensure maximum questionnaire comprehension, respondents were asked if they would like the questionnaires to be read aloud to them by the researcher. This format was chosen by the majority of FIPP respondents (> 80%). Unfortunately, this information was not systematically recorded for TAU respondents.

### **Analyses Strategy and Power Analyses**

All analyses were conducted using IBM SPSS statistics 21.0. Participants lost to follow up were not included in analyses. Thus, we chose to implement treatment retention analyses rather than intention-to-treat analyses because we wanted to examine the effects of the FIPP when delivered as planned. A mixed design ANOVA was conducted on each of the primary and secondary outcome measures with Intervention (FIPP vs. TAU) as the between participants factor and Time (Time 1 Baseline vs. Time 2 End of Treatment) as the within participants factor. Paired comparisons were used to follow up significant interaction effects. In order to calculate the magnitude of any detected treatment gains, we calculated effect sizes (Cohen's *d*) for each individual (i.e., the difference between their Time 1 and Time 2 scores divided by the overall group Time 1 standard deviation). We then categorized each participant according to whether their effect size calculation indicated a notable improvement ( $\geq .50$ ) at Time 2 as proposed by Eisen, Ranganathan, Seal, and Spiro (2007). Thus, using this criterion, for each significant treatment effect observed we report the percentage of participants within each group who show notable improvement along with Pearson's  $\chi^2$  test of independence and associated Odds Ratios. In order to examine whether any detected treatment gains remain stable three months post treatment, paired comparisons were used (Time 1 Baseline vs. Time 3 Follow Up). We also report these paired comparisons for the TAU group. Finally, a standard simultaneous multiple regression was conducted to identify whether any key variables could statistically predict treatment response on the primary Fire Factor outcome measure.

G\*Power (Version 3.1; Faul, Erdfelder, Land, & Buchner, 2007; with at least 80% power and  $\alpha = .05$ ) indicated that a total sample size of 92 participants would be required to conduct each mixed design ANOVA and detect a medium interaction effect (.25), a total sample size of 52 would be required to conduct each paired t-test and detect a medium effect (.35), and a total sample size of 58 would be required for a regression with a maximum of 5 predictor variables.

## **Results**

### **Participant Demographics**

**FIPP.** One hundred and thirty one male firesetters were initially referred for FIPP treatment (see Figure 1). Of these, six were ineligible for treatment due to impending release dates or inappropriate offense history (i.e., firesetting offenses occurred solely in childhood) and 50 declined to take part in treatment either because they felt it would not be beneficial or because they declined to relocate prison establishment. A further six individuals were lost immediately prior to treatment commencement due to prison transfer or release. Sixty-nine participants eventually enrolled for a FIPP treatment group. Fourteen participants (20.3%) were lost during FIPP treatment and one participant declined to allow his data to be used for the research resulting in 54 FIPP participants at Time 2 Follow Up. There were no significant differences on any of the key demographic variables outlined in Table 1 between participants who completed FIPP treatment and those lost during treatment (all  $ps = ns$ ). However, At Time 3 a further 7 participants were lost to follow up, leaving 47 FIPP participants.

Figure 1 About Here

**TAU.** Eighty-four male firesetters were initially approached and asked to participate in the study as the TAU group (see Figure 1). Of these, 14 declined to participate and one was ineligible for study participation since his only firesetting offenses occurred in childhood.



One participant who began the Time 1 assessments was unable to complete the assessment battery resulting in 68 participants who completed the Time 1 assessments. Twenty three (33.8%) participants were lost during the TAU period resulting in 45 TAU participants at Time 2 Follow Up. There were no significant differences on any of the key demographic variables outlined in Table 1 between participants who participated in the study in full and those lost during the TAU period (all  $ps = ns$ ). At Time 3 a further 32 participants were lost to follow up, leaving 13 TAU participants.

Table 1 About Here

**Demographic Comparison.** There were no baseline differences between FIPP and TAU groups on age, formal education, ethnicity, lifetime engagement with mental health services, sentence length, number of firesetting, sexual, theft, fraud, public disorder or drug offenses, number of self reported adult fires set, target of firesetting, or denial of firesetting. However, FIPP firesetters held a higher number of violent offenses on record,  $t(86) = 2.0, p = .04, d = .49$  and held significantly higher numbers of property offenses on record,  $t(86) = 2.3, p = .02, d = .49$  (see Table 1).

### **Impression Management**

For the BIDR Impression Management Scale, no notable differences were detected at baseline between FIPP and TAU participants,  $t(97) = 1.12, p = .27, d = .23$  and there was no significant Intervention x Time interaction, Wilks' Lamda = .97,  $F(1, 96) = 2.7, p = .10, \eta_p^2 = .03$ . Thus, treatment effect analyses have not been adjusted for Impression Management.

### **Treatment Effects**

For the primary outcome of the Fire Factor Scale, there was a significant Intervention x Time interaction, Wilks' Lamda = .94,  $F(1, 97) = 6.4, p = .01, \eta_p^2 = .06$  indicating that, at Time 2, firesetters attending FIPP demonstrated a significant decrease on the Fire Factor

Scale ( $p = .001$ ,  $d_z = .30$ ) which was not the case for firesetters undertaking TAU ( $p = .81$   $d_z = .04$ ). Individual effect size calculations indicated that 38.9% ( $n = 21$ ) of FIPP participants showed a notable improvement on the Fire Factor Scale compared to 15.6% ( $n = 7$ ) of TAU participants ( $p = .01$ ,  $OR = 3.45$ ). Furthermore, firesetters who attended FIPP maintained this decrease three-months post treatment ( $p = .003$   $d_z = 0.47$ ), whilst TAU firesetters exhibited no discernible shifts ( $p = .86$   $d_z = .05$ ). For the primary outcome of Fire Relapse Prevention Awareness there was no Intervention x Time interaction, Wilks' Lamda = .98,  $F(1, 81) = 1.78$ ,  $p = .19$ ,  $\eta_p^2 = .02$  although there was a main effect of time illustrating that awareness of firesetting risk increased regardless of treatment,  $F(1, 81) = 10.20$ ,  $p = .002$ ,  $\eta_p^2 = .11$ . For the final primary outcome of Fire Relapse Prevention Strategies there was no Intervention x Time interaction, Wilks' Lamda = .96,  $F(1, 81) = 3.03$ ,  $p = .09$ ,  $\eta_p^2 = .04$  although there was a main effect of time illustrating that knowledge of strategies for dealing with firesetting risk increased regardless of Intervention,  $F(1, 81) = 13.66$ ,  $p < .001$ ,  $\eta_p^2 = .14$ . Relapse Prevention Strategy scores increased by a mean of 2.6 at Time 2 for the FIPP group and by a mean of 0.6 for TAU (see Table 2).

For secondary outcomes, a significant Intervention x Time interaction was detected for MCAA Violence, Wilks' Lamda = .95,  $F(1, 97) = 4.69$ ,  $p = .03$ ,  $\eta_p^2 = .05$ , showing that FIPP firesetters at Time 2 significantly decreased in violence supportive attitudes ( $p = .001$ ,  $d_z = .46$ ), whilst TAU firesetters did not ( $p = .55$ ,  $d_z = .09$ ). Effect size calculations indicated that 42.6% ( $n = 23$ ) of FIPP participants showed a notable improvement on attitudes supporting violence compared to 24.4% ( $n = 11$ ) of TAU participants ( $p = .05$ ,  $OR = 2.29$ ). Firesetters who attended FIPP maintained this decrease three-months post treatment ( $p = .022$   $d_z = .35$ ), whilst TAU firesetters exhibited no significant shifts ( $p = .09$   $d_z = .51$ ). There was also a significant Intervention x Time interaction for MCAA Antisocial, Wilks' Lamda = .92,  $F(1, 97) = 7.99$ ,  $p = .006$ ,  $\eta_p^2 = .08$ , illustrating that, at time 2, firesetters undertaking the

FIPP significantly decreased in antisocial attitudes ( $p < .001$ ,  $d_z = .51$ ) which was not the case for TAU firesetters ( $p = .79$ ,  $d_z = .04$ ). Effect sizes indicated that 44.4% ( $n = 24$ ) of FIPP participants showed a notable improvement on antisocial attitudes compared to 33.3% ( $n = 15$ ) of TAU participants ( $p = .26$ ,  $OR = 1.6$ ). Three-months post treatment, FIPP firesetters maintained this decrease ( $p = .006$ ,  $d_z = .42$ ), whilst TAU firesetters showed no significant shifts ( $p = .17$ ,  $d_z = .43$ ). For MCAA entitlement, the Intervention x Time interaction was not significant, Wilks' Lamda = .99,  $F(1, 97) = 1.07$ ,  $p = .30$ ,  $\eta_p^2 = .01$ , and there was no main effect of time  $F(1, 97) = 2.35$ ,  $p = .13$ ,  $\eta_p^2 = .02$ .

For the secondary outcome of Locus of Control, there was a trend towards a significant Intervention x Time interaction, Wilks' Lamda = .96,  $F(1, 97) = 3.73$ ,  $p = .06$ ,  $\eta_p^2 = .04$ , indicating that, at Time 2, firesetters attending FIPP demonstrated a significant increase on internalized locus of control ( $p = .019$ ,  $d_z = .33$ ) which was not evidenced by the TAU group ( $p = .67$ ,  $d_z = .06$ ). However, effect size calculations indicated that 40.7% ( $n = 22$ ) of FIPP participants showed a notable shift towards internalized Locus of Control compared to 33.3% ( $n = 15$ ) of TAU participants ( $p = .45$ ,  $OR = 1.38$ ). Three-months post treatment, FIPP firesetters still showed this increase on internalized locus of control ( $p < .001$ ,  $d_z = .59$ ), which was not apparent in firesetters undertaking TAU ( $p = .74$ ,  $d_z = .09$ ).

#### Table 2 About Here

For the NAS Total, there was no Intervention x Time interaction ( $F < 1$ ) nor main effect of time. On the NAS Regulation subscale, there was a trend towards a significant Intervention x Time interaction, Wilks' Lamda = .97,  $F(1, 97) = 3.20$ ,  $p = .08$ ,  $\eta_p^2 = .03$ . Comparisons indicated that, at Time 2, firesetters undertaking the FIPP significantly increased their self-reported ability to effectively regulate anger ( $p = .002$ ,  $d_z = .45$ ), but the TAU firesetters did not ( $p = .44$ ,  $d_z = .12$ ). Individual effect size calculations indicated that 44.4% ( $n = 24$ ) of FIPP participants showed a notable improvement on NAS Regulation

compared to 31.1% ( $n = 14$ ) of TAU participants ( $p = .17$ ,  $OR = 1.77$ ). By time three, FIPP participants still exhibited gains on regulation ( $p = .02$ ,  $d_z = .35$ ) relative to the TAU firesetters who by this stage also appeared to have made some improvements in this area relative to baseline ( $p = .04$ ,  $d_z = .63$ ). There was no significant Intervention x Time interaction on the PI, Wilks' Lambda = 1.0,  $F(1, 97) = 1.03$ ,  $p = .31$ ,  $\eta_p^2 = .01$ , although there was a significant main effect of time showing that anger to provocation decreased regardless of treatment,  $F(1, 97) = 4.08$ ,  $p = .04$ ,  $\eta_p^2 = .04$ . PI scores decreased by a mean of 2.9 at Time 2 for the FIPP group and by a mean of 0.9 for TAU (see Table 2).

For secondary outcome measures associated with social competence, no Intervention x Time interactions were detected for UCLA loneliness,  $F(1, 95) = 2.92$ ,  $p = .09$ ,  $\eta_p^2 = .03$ , Assertiveness,  $F(1, 96) = 1.92$ ,  $p = .10$ ,  $\eta_p^2 = .03$ , or CFSEI General,  $F(1, 97) = .31$ ,  $p = .58$ ,  $\eta_p^2 = .003$ . CFSEI General demonstrated a significant main effect of time ( $p < .01$ ). Here, general self-esteem appeared to increase regardless of treatment and mean score increases were largely comparable between groups (see Table 2).

We calculated the percentage of FIPP participants who made at least one meaningful change (based on individual effect size calculations) on at least one primary outcome measure and one secondary outcome measure. Overall, 74.1% of FIPP participants made at least one meaningful change in both areas relative to 37.8% of TAU participants ( $p < .001$ ,  $OR = 4.71$ ).

### **Prediction of Primary Outcome**

We examined the following potential baseline predictors and their association with improvement on the Fire Factor Scale for FIPP participants at Treatment Completion (Time 2): age, years of formal education, sentence length, childhood firesetting (number of self reported incidents), adult firesetting (number of self reported incidents), total number of lifetime offenses (from file information), total number of firesetting offenses (from file

information), mental health problems (any self-reported lifetime engagement with mental health services), previous experience of psychological treatment, and denial of firesetting. Initial analyses revealed that only years of formal education ( $rs = .37, p = .02$ ), adult firesetting ( $rs = .43, p = .003$ ), and total number of lifetime offenses ( $r = -.36, p = .01$ ) were significantly related to improvement on the Fire Factor Scale. Entering each of these three variables into a simultaneous multiple regression to predict improvement on the Fire Factor Scale resulted in a significant model,  $F(3,35) = 2.99, p = .04$ , adjusted  $R^2 = .136$ . The only marginal significant predictor was number of self reported incidents of adult firesetting ( $beta = .32, p = .05$ ). Years of formal education and total number of lifetime offenses did not significantly predict change on the Fire Factor Scale.

## Discussion

This study is the first trial to evaluate group CBT designed specifically to target psychological factors associated with firesetting in male prisoners. The group therapy administered—the Firesetting Intervention Programme for Prisoners (FIPP)—was designed to facilitate a reduction in prisoners’ problematic fire interest, attitudes, and associations with fire as well as increase general understanding of firesetting risk and associated strategies for dealing with such risk. Since the FIPP was designed to target all key factors empirically implicated in the facilitation of firesetting, it was also anticipated that clients would experience pro-social changes in areas of Offense-Supportive Cognition (i.e., attitudes supporting violence, entitlement and antisocial behavior), Emotional Regulation (i.e., locus of control as well as anger inclination, regulation, and ability to tolerate provocation), and Social Competency (i.e. assertiveness, emotional loneliness, and general self esteem).

Our key findings showed that, compared to a control group of firesetters who did not receive specialist firesetting treatment, the 28-week FIPP significantly improved firesetting

prisoners' self-reported problematic fire interest and associations with fire, attitudes towards violence, and antisocial attitudes. When individual effect size measurements were calculated and compared between the groups, we found that FIPP participants made most notable gains on the Fire Factor Scale. Here, the odds of making significant improvement in this area for the FIPP group was calculated as being 3.45 times greater than for the TAU group. All key improvements noted for the FIPP group were also maintained three-months post treatment. In addition to these key findings, we observed a trend for FIPP participants to increase self-reported effective anger regulation and internalized Locus of Control at treatment completion. On factors measuring awareness of firesetting risk and strategies, both groups of participants were observed to make self-reported improvements regardless of whether or not they received the specialist FIPP. A similar effect was noted for ability to tolerate provocation and general self-esteem. In all other areas of emotional regulation and social competency, no improvements were evident regardless of intervention type. However, we calculated that, overall, the odds of making a significant improvement in at least one fire related primary variable *and* at least one non-fire related secondary outcome was 4.71 times greater for FIPP participants than for the TAU group. Overall, these findings add to the growing body of literature suggesting a need for specialist CBT targeting deliberate firesetting behavior (Gannon et al., 2013; Hall, 1995; Swaffer et al., 2001; Taylor et al., 2002, Taylor et al., 2006).

Our findings represent the largest ever evaluation of specialist treatment for deliberate firesetters and illustrate that a consistent CBT approach is successful in reducing key psychological factors associated with firesetting. These findings extend existing small-scale treatment evaluations conducted within healthcare settings (e.g., Swaffer et al., 2001; Taylor et al., 2002; Taylor et al., 2006) in three main ways. First, our evaluation measured the effectiveness of specialist firesetting treatment over and above the effects of completing

treatment as usual. This means that—unlike previous evaluation research—we can be more confident in ruling out the possibility that length of incarceration or other general activities were responsible for the treatment gains observed. Second, our evaluation incorporated a broad number of treatment outcomes associated with the very latest firesetting research. These treatment outcomes were measured using standardized questionnaires examining various variables relating to fire, relapse prevention, offense-supportive cognition, emotional regulation, and social competency. Finally, our evaluation is the first to examine the effects of treatment for deliberate firesetters within a prison setting.

When compared with the largest previous evaluation study available (i.e., Taylor et al., 2002;  $N = 14$ ), our findings support their findings regarding the beneficial effects of specialist CBT for reducing fire interest and other problematic associations with fire. Notably, in their small-scale healthcare evaluation, Taylor et al. also reported significant reductions in variables measuring understanding of risk and self esteem. Our research suggests that such reductions may simply reflect generic improvements associated with progression in secure facilities. In their evaluation, Taylor et al. reported a significant total score reduction on a learning disabled adapted version of the NAS incorporating cognition, anger, and behavior (Novaco & Taylor, 2004). We found only a trend towards an increase in self reported effective anger regulation; an aspect not measured by Taylor et al. Given that the FIPP focuses on the development of coping strategies, it is perhaps not surprising to see a trend in this area of the NAS rather than on areas relating to general experiences of anger. Furthermore, it is worth noting that Taylor et al.'s intervention was developed for patients with a learning disability in a mental health setting and so may have focused more on the concept of anger relative to the FIPP. Unlike Taylor et al., we measured antisocial attitudes in our cohort of firesetters and found that treatment facilitated significant reductions in attitudes supporting violence and antisocial behavior. We also found, that our specialist treatment

demonstrated a trend towards improving firesetters' self reported internalized locus of control.

Interestingly, during the second part of our evaluation we found that improvement on the primary outcome of the Fire Factor Scale post treatment was not associated with baseline measurements such as age, sentence length, childhood firesetting, mental health problems, previous experience of treatment, total number of firesetting offenses (from file information) or denial of firesetting. In fact, of the three factors associated with improvement on the Fire Factor Scale (formal education, number of self reported adult firesetting incidents, and total number of lifetime offenses) only self-reported adult firesetting entered the final regression equation as a marginally significant predictor. This finding suggests that clients who hold most problems in the area of firesetting are those likely to benefit most from specialist treatment. While this finding may be important for guiding client selection onto specialist firesetting treatment in the future, further exploration of the factors relating to therapeutic progression as well as analysis of how such factors fit with the Risk, Need, Responsivity model (Andrews & Bonta, 2010) would be highly informative. Our finding, that higher levels of self-reported adult firesetting predicted greater improvement on the Fire Factor Scale, is especially interesting given that formal recorded convictions for fire-relevant offenses were not related to such improvements. This supports the longstanding assumption that official records of arson may severely underestimate rates of firesetting behavior (Arson Control Forum, 2003; Dolan, McEwan, Doley, & Fritzson, 2011) and appears to indicate that such records should not be solely relied upon for therapeutic planning purposes. The disparity in number of recorded firesetting offenses and number of self reported fires set is clearly illustrated in Table 1 where number of self reported fires is notably higher for both the FIPP and TAU groups.



## **Limitations**

A key limitation associated with non-randomized trials is the possibility that the treatment and comparison group differ in some way that confounds treatment effects. For example, it is possible that the slightly higher level of attrition for TAU participants at Time 2 may have led to some unknown systematic bias. It is also possible that offenders with a more notable or prolific firesetting history were referred for treatment relative to TAU participants. Our analysis showed FIPP participants held more total violent offenses and property offenses on record. This could indicate some propensity for FIPP participants to be more problematic offenders. However, if this is the case then the FIPP group is likely to hold a larger number of treatment needs which research suggests would have given this group less of an opportunity to make observable gains in treatment (see Andrews & Bonta, 2010). However, no other baseline differences between the groups on potential confounding variables (e.g., formal education, lifetime engagement with mental health services, sentence length, number of self reported adult fires set, officially recorded firesetting offenses) were detected. It should be noted, however, that we were not always able to obtain full sets of data for all key variables. Consequently, we can be reasonably confident that the improvements observed in our evaluation are not confounded by age, formal education, ethnicity, or sentence length for which we held complete data. However, missing data associated with variables such as number of offenses, target of firesetting, and number of self reported adult fires set mean that we can not be fully confident that our FIPP and TAU group do not differ on these variables.

A further limitation relates to sample size. Although we initially invited 215 participants to take part in our evaluation, the attrition rate for reaching Time 2 was high (58.8% for FIPP participants and 46.4% for TAU) resulting in an overall sample size of 99 for the main Interaction x Time analyses. Such attrition rates are not unusual in forensic samples (Olver, Wong, & Nicholaichuck, 2009), and did not substantially decrease the

statistical power required to detect significant interaction effects according to our a priori power analyses. The key reasons for attrition at Time 2 in our study related to unforeseeable prison transfer /release or treatment drop out which was typically associated with medical or mental health issues. Whilst many of these latter issues were also unforeseeable, improved mental health provision within prisons could alleviate attrition in future programmes (see National Health Service Commissioning Board, 2013). Attrition did severely influence the numbers of individuals available in the TAU group at Time 3 ( $n = 13$ ) which substantially decreased statistical power to detect a medium effect according to our a priori power analysis. The majority of attrition here related to prison transfers which occurred over the time period of our study. Given this latter difficulty, and the fact that we did not feel it necessary to adjust our analyses for impression management, our study should be viewed as a more cautious estimate of the long term treatment effects associated with specialist CBT for firesetters.

A key issue associated with the interpretation of treatment effectiveness studies is that it is difficult to pinpoint exactly which part of treatment is responsible for the positive effects observed. In our study, for example, it is unclear whether improvement was associated with psychoeducation work or CBT. Furthermore, we do not know whether incorporating individual follow up sessions—a component often absent from forensic group work—served to strengthen the positive effects associated with treatment. Given that we found participants in both the FIPP and TAU groups increased in their awareness of fire risk and strategies, it is likely that factors non-specific to the FIPP are responsible for eliciting change in these areas. Future research is required to further specify the exact components associated with treatment progression in relation to firesetting. In particular, work is needed to disentangle the effects of CBT and educational fire safety training as well as work to ascertain why the program is impacting upon specific areas (i.e., the Fire Factor Scale and Offense-Supportive Cognition) and not others (i.e., Social Competence).

Finally, a notable limitation of our study is that outcome measures were self-reported psychological factors empirically associated with firesetting rather than direct measures of firesetting behavior. Furthermore, one of these measures (The Fire Relapse Prevention Questionnaire; Beckett et al., 2011) was developed specifically for this study, held very low test-retest reliabilities (possibly due to floor effects), and has yet to be fully psychometrically verified. This problem is likely to have obscured gains meaning that our study is likely to represent a more conservative estimate of treatment success. Ideally, future treatment evaluations with firesetters should seek to establish direct behavioral outcome measures that bypass the limitations of self-report. Post release recidivism figures, for example, would provide direct evidence of whether specialist treatment for firesetters reduces problematic firesetting.

## **Conclusions**

This study is the first trial examining the effectiveness of specialist treatment for prisoners who have set deliberate fires. Our analyses of primary and secondary outcome measures showed that participants who received specialist treatment improved significantly on one of three primary outcomes (i.e., interest and approach towards fire) as well as improving on some secondary outcomes (i.e., violent and antisocial attitudes) relative to participants who engaged in TAU. These improvements were sustained three-months post treatment. Trends were also noted for improvements on secondary measures examining emotional regulation and locus of control. However, no beneficial effects of specialist treatment were observed for social competency nor for the majority of emotional regulation measures. Our study suggests that specialist interventions may be best targeted at those who hold the most serious firesetting behavior. Nevertheless, further trials are required—perhaps

with a randomized component—to further specify both the breadth of factors impacted through specialist treatment as well as the key criteria leading to therapeutic improvement.

## References

- Andrews, D. A., & Bonta, J. L. (2010). *The psychology of criminal conduct* (5<sup>th</sup> edition). Cincinnati, OH: Anderson.
- Arson Control Forum (2003). *Research bulletin no. 1. Arson: From reporting to conviction*. Office of the Deputy Prime Minister. Retrived from:  
<http://www.stoparsonuk.org/documents/resources/No1%20From%20Reporting%20to%20Conviction.pdf>
- Battle, J. (1992). *Culture-free Self-Esteem Inventories* (2nd ed.). Austin, TX: PRO-ED.
- Battle, J. (1997). Culture-free Self-esteem Inventories for children and adults. In C. P. Zalaquett & R. J. Wood (Eds.), *Evaluating stress: A book of resources* (pp. 67-95). London: The Scarecrow Press, Inc.
- Beckett, R. C., Fisher, D., Mann, R., & Thornton, D. (1998). The relapse prevention questionnaire and interview. In H. Eldridge (Ed.), *Therapist guide for maintaining change* (pp. 138-150). London: Sage.
- Beckett, R. C., Fisher, D., Mann, R., Thornton, D., & Gannon, T. A. (2011). *The fire relapse prevention questionnaire and scoring procedure*. Unpublished questionnaire.
- Campbell, R. (2014). *Intentional fires*. Massachusetts, United States: National Fire Protection Association. Retrieved from  
<http://www.nfpa.org/~media/files/research/nfpa%20reports/major%20causes/osintentional.pdf>
- Culhane, S. E., & Morera, O. F. (2010). Reliability and validity of the Novaco Anger Scale and Provocation Inventory (NAS-PI) and State-Trait Anger Expression Inventory-2 (STAXI-2) in hispanic and non-hispanic white student samples. *Hispanic Journal of Behavioral Sciences*, 32(4), 586-606. doi:10.1177/0739986310381458
- Department for Communities and Local Government (2010). *Fire Statistics United Kingdom*

2008. Retrieved from  
<http://www.communities.gov.uk/documents/statistics/pdf/1780609.pdf>
- Dickens, G., Sugarman, P., & Gannon, T. A. (Eds.). (2012). *Firesetting and mental health: Theory, research and practice*. London: RCPsych Pubs.
- Dolan, M., McEwan, T. E., Doley, R., & Fritzon, K. (2011). Risk factors and risk assessment in juvenile fire-setting. *Psychiatry, Psychology and Law*, 18, 378-394. doi: 10.1080/13218719.2011.559154
- Ducat, L., McEwan, T. E., & Ogloff, J. R. P. (2015). An investigation of firesetting recidivism: Factors related to repeat offending. *Legal and Criminological Psychology*, 20, 1-18. doi: 10.1111/lcrp.12052
- Eisen, S. V., Ranganathan, G., Seal, P., & Spiro, A. (2007). Measuring clinically meaningful change following mental health treatment. *Journal of Behavioral Health Services and Research*, 34, 272-289. doi: 10.1007/s11414-007-9066-2
- Faul, F., Erdfelder, E., Lang, A., & Buchner, A. (2007). G\*Power 3: A flexible statistical power analysis program for the social, behavioural, and biomedical sciences. *Behaviour Research Methods*, 35, 175-191. doi: 10.3758/BF03193146
- Fritzon, K., Doley, R. & Clark, F. (2013). What works in reducing arson-related offending. In L. A. Craig, L. Dixon, & T. A. Gannon (Eds.), *What works in offender rehabilitation: An evidence-based approach to assessment and treatment* (pp. 255-270). Chichester, England: Wiley-Blackwell.
- Gannon, T. A., Ó Ciardha, C., & Barnoux, M. L. (2011). *The identification with fire questionnaire*. Unpublished manuscript, CORE-FP, School of Psychology, University of Kent, UK.
- Gannon, T. A., Ó Ciardha, C., Barnoux, M. L., Tyler, N., Mozova, K., & Alleyne, E. K. A. (2013). Male imprisoned firesetters have different characteristics than other

- imprisoned offenders and require specialist treatment. *Psychiatry: Interpersonal and Biological Processes*, 76, 349-364. doi: 10.1521/psych.2013.76.4.349
- Gannon, T. A., Ó Ciardha, C., Doley, R. M., & Alleyne, E. (2012). The Multi-Trajectory Theory of Adult Firesetting (M-TTAF). *Aggression and Violent Behavior*, 17(2), 107-121. doi:10.1016/j.avb.2011.08.001
- Gannon, T. A., & Pina, A. (2010). Firesetting: Psychopathology, theory and treatment. *Aggression and Violent Behavior*, 15(3), 224-238. doi:10.1016/j.avb.2010.01.001
- George, D., & Mallery, P. (2003). *SPSS for windows step by step: A simple guide and reference 11.0 update* (4<sup>th</sup> ed.). Boston, MA: Allyn and Bacon.
- Hall, G. (1995). Using group work to understand arsonists. *Nursing Standard*, 9, 25-28.
- Hanson, R. K., Gordon, A., Harris, A. J. R., Marques, J. K., Murphy, W., Quinsey, V. L., & Seto, M. C. (2002). A report of the collaborative outcome data project on the effectiveness of psychological treatment for sex offenders. *Sexual Abuse: A Journal of Research and Treatment*, 14, 169-194. doi: 1079-0632/02/0400-0169/0
- Horowitz, L. M., Rosenberg, S. E., Baer, B. A., Ureño, G., & Villaseñor, V. S. (1988). Inventory of interpersonal problems: Psychometric properties and clinical applications. *Journal of Consulting and Clinical Psychology*, 56(6), 885-892. doi:10.1037/0022-006x.56.6.885
- Jenerette, C., & Dixon, J. (2010). Developing a Short Form of the Simple Rathus Assertiveness Schedule Using a Sample of Adults With Sickle Cell Disease. *Journal of Transcultural Nursing*, 21(4), 314-324. doi:10.1177/1043659609360712
- Jennings, J. L., & Deming, A. (2013). Effectively utilizing the “behavioral” in Cognitive-Behavioral group therapy of sex offenders. *International Journal of Behavioral Consultation and Therapy*, 8, 7-13. doi: 10.1037/h0100968

- Landenberger, N. A., & Lipsey, M. W. (2005). The positive effects of cognitive-behavioral programs for offenders: A meta-analysis of factors associated with effective treatment. *Journal of Experimental Criminology*, 1, 451-476. doi: 10.1007/s11292-005-3541-7
- Lanyon, R. I., & Carle, A. C. (2007). Internal and external validity scores on the Balanced Inventory of Desirable Responding and the Paulhus Deception Scales. *Educational and Psychological Measurement*, 67, 859-876. doi: 10.1177/0013164406299104
- Lipsey, M. W., Chapman, G. L., & Landenberger, N. A. (2001). Cognitive-behavioral programs for offenders. *The Annals of the American Academy of Political and Social Science*, 578, 144-157. doi: 10.1177/000271620157800109
- Milkman, H., & Wandberg, K. (2007). *Cognitive behavioral treatment: A review and discussion for corrections' professionals*. Washington, DC: National Institute of Corrections.
- Mills, J. F., & Kroner, D. G. (1999). *Measures of Criminal Attitudes and Associates: User Guide*. Unpublished instrument and user guide.
- Mills, J. F., Kroner, D. G., & Forth, A. E. (2002). Measures of Criminal Attitudes and Associates (MCAA): Development, factor structure, reliability, and validity. *Assessment*, 9(3), 240-253. doi: 10.1177/1073191102009003003
- Mills, J. F., Kroner, D. G., & Hemmati, T. (2004). The Measures of Criminal Attitudes and Associates (MCAA). *Criminal Justice and Behavior*, 31(6), 717-733. doi:10.1177/0093854804268755
- Ministry of Justice (2013). *Costs per place and costs per prisoner: National Offender Management Service annual report and accounts 2012-2013 management information addendum management information addendum*. Retrieved from [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/251272/](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/251272/)



prison-costs-summary-12-13.pdf

- Muckley, A. (1997). *Firesetting: Addressing offending behaviour: A resource and training manual*. Redcar and Cleveland Psychological Service.
- Murphy, G. H., & Clare, I. C. H. (1996). Analysis of motivation in people with mild learning disabilities (mental handicap) who set fires. *Psychology, Crime & Law*, 2(3), 153-164. doi:10.1080/10683169608409774
- National Health Service Commissioning Board (2013). *Securing excellence in commissioning for offender health*. NHS. Available from <http://www.england.nhs.uk/wp-content/uploads/2013/03/offender-commissioning.pdf>
- Novaco, R. W. (2003). *The Novaco anger scale and provocation inventory: NAS-PI*. Los Angeles, CA: Western Psychological Services.
- Novaco, R. W., & Taylor, J. L. (2002). Assessment of anger and aggression in male offenders with developmental disabilities. *Psychological Assessment*, 16, 42-50. doi: 10.1037/1040-3590.16.1.42
- Nowicki, S., & Duke, M. P. (1974). A Locus of Control Scale for Noncollege as Well as College Adults. *Journal of Personality Assessment*, 38(2), 136-137. doi:10.1080/00223891.1974.10119950
- Nowicki, S., Jr. . (1976). *Adult Nowicki-Strickland internal-external Locus of Control Scale*. (Test Manual available from S. Nowicki, Jr., Department of Psychology, Emory University, Atlanta, GA 30322).
- Ó Ciardha, C., Barnoux, M., Alleyne, E., Tyler, N., Mozova, K., & Gannon, T. A. (2015). Multiple factors in the assessment of firesetters' fire interest and attitudes. *Legal and Criminological Psychology*, 20, 37-47. doi: 10.1111/lcrp.12065

- Ó Ciardha, C., Gannon, T. A., & Tyler, N. (2014). *A practical guide to assessing adult firesetters' fire-related treatment needs using the Five Factor Fire Scale*. Manuscript submitted for publication.
- Office of the Deputy Prime Minister (2006). *The economic costs of fire: Estimates for 2004 April*. London: Office of the Deputy Prime Minister.
- Olver, M. E., Wong, S. C. P., Nicholaichuk, T. P. (2009). Outcome evaluation of a high-intensity inpatient sex offender treatment program. *Journal of Interpersonal Violence*, 24, 522-536. doi: 10.1177/0886260508317196
- Palmer, E. J., Caulfield, L. S., & Hollin, C. R. (2007). Interventions with arsonists and young fire setters: A survey of the national picture in England and Wales. *Legal and Criminological Psychology*, 12(1), 101-116. doi:10.1348/135532505x85927
- Paulhus, D. L. (1991). Measurement and control of response bias. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (pp. 17-59). San Diego, CA: Academic Press.
- Paulhus, D. L. (1994). *Balanced Inventory of Desirable Responding: Reference manual for BIDR Version 6*. Unpublished manuscript, University of British Columbia, Vancouver, Canada.
- Pearson, F. S., Lipton, D. S., Cleland, C. M., & Yee, D. S. (2002). The effects of behavioral/cognitive-behavioral programs on recidivism. *Crime and Delinquency*, 48, 476-496. doi: 10.1177/001112870204800306
- Redondo, S. Sánchez-Meca, J., & Garrido, V. (1999). The influence of treatment programmes on the recidivism of juvenile and adult offenders: An european meta-analytic review. *Psychology, Crime and Law*, 5, 251-278. doi: 10.1080/10683169908401769
- Rowlings, K. (2008). *Counting the costs of crime in Australia: A 2005 update*. Research and Public Policy Series No. 91. Canberra, ACT: Australian Institute of Criminology.

Retrieved from <http://www.aic.gov.au/documents/9/A/3/{9A333836-6275-4855-9C0B-20FB05B05992}rpp91.pdf>

- Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The revised UCLA Loneliness Scale: concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*, 39(3), 472-480. doi:10.1037//0022-3514.39.3.472
- Stöber, J., Dette, D. E., & Musch, J. (2002). Comparing Continuous and Dichotomous Scoring of the Balanced Inventory of Desirable Responding. *Journal of Personality Assessment*, 78(2), 370-389. doi: 10.1207/s15327752jpa7802\_10
- Swaffer, T., Haggett, M., & Oxley, T. (2001). Mentally disordered firesetters: A structured intervention programme. *Clinical Psychology & Psychotherapy*, 8(6), 468-475. doi: 10.1002/cpp.299
- Taylor, J. L., Robertson, A., Thorne, I., Belshaw, T. & Watson, A. (2006). Responses of female fire-setters with mild and borderline intellectual disabilities to a group intervention. *Journal of Applied Research in Intellectual Disabilities*, 19, 179-190. doi: 10.1111/j.1468-3148.2005.00260.x
- Taylor, J. L., Thorne, I., Robertson, A., & Avery, G. (2002). Evaluation of a group intervention for convicted arsonists with mild and borderline intellectual disabilities. *Criminal Behaviour and Mental Health*, 12(4), 282-293. doi: 10.1002/cbm.506
- Walker, D. F., McGovern, S. K., Poey, E. L., & Otis, K. E. (2005). Treatment effectiveness for male adolescent sexual offenders: A meta-analysis and review. *Journal of Child Sexual Abuse*, 13, 281-293. doi: 10.1300/J070v13n03\_14

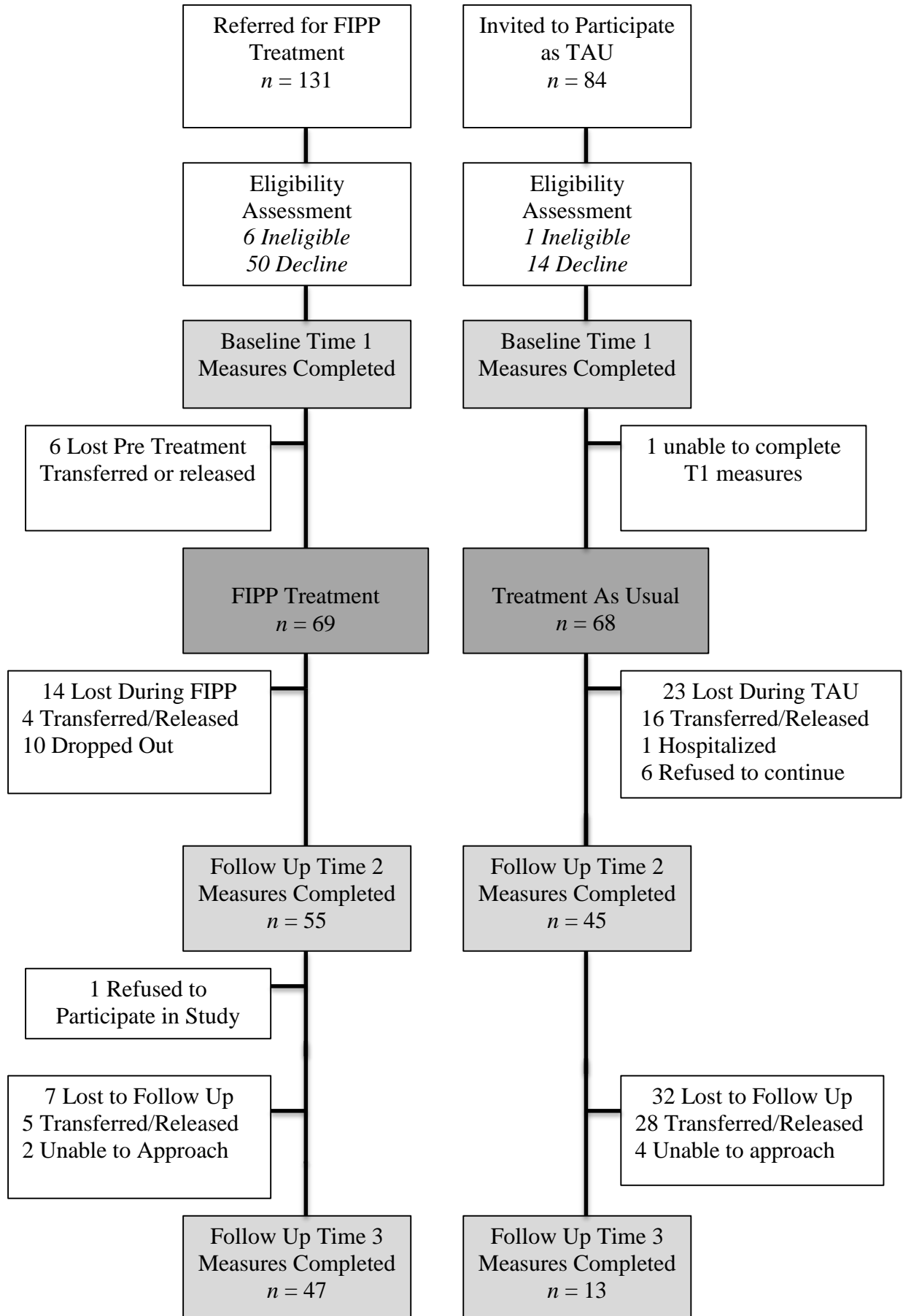


Figure 1. Diagram of Study Protocol

Table 1

*Pre-Treatment Demographic Variables Associated with Firesetters Assigned to the FIPP Treatment (n = 54) and Firesetters Assigned to the Treatment as Usual condition (n = 45)*

Variable	FIPP Treatment	Treatment as Usual
Age <i>M</i> years ( <i>SD</i> )	34.6 (13.4)	31.4 (11.3)
Formal Education <i>M</i> years ( <i>SD</i> )	10.9 (3.4)	12.1 (2.4)
Ethnicity		
White European (%)	79.7	82.2
Black Ethnic Minority (%)	5.6	4.4
Other (%)	14.7	13.4
Lifetime Engagement with Mental Health Services (%)	66.7	51.1
Sentence Length <i>M</i> years ( <i>SD</i> )	6.4 (4.7)	5.8 (5.7)
Number of Offenses <sup>a</sup>		
Firesetting <i>M</i> ( <i>SD</i> )	2.1 (2.6)	1.6 (1.1)
Violent <i>M</i> ( <i>SD</i> )	2.0 (2.2)	1.1 (1.8) *
Sexual <i>M</i> ( <i>SD</i> )	0.2 (1.0)	0.1 (0.6)
Thefts <i>M</i> ( <i>SD</i> )	7.8 (10.6)	7.2 (11.7)
Fraud <i>M</i> ( <i>SD</i> )	0.6 (1.6)	0.3 (0.9)
Property <i>M</i> ( <i>SD</i> )	4.1 (4.0)	2.2 (3.7) *
Public Disorder <i>M</i> ( <i>SD</i> )	1.1 (2.0)	1.1 (1.7)
Drug <i>M</i> ( <i>SD</i> )	1.0 (2.1)	0.7 (1.9)
Number of Self Reported Adult Fires Set <sup>b</sup> <i>M</i> ( <i>SD</i> )	5.3 (15.3)	3.4 (10.9)
Firesetting Includes <sup>c</sup>		
Cell Fire(s) (%)	12.0	17.9
Self Harm/Attempted Suicide (%)	20.4	7.1
Attempt Direct Harm to Other (%)	26.0	8.6

Denies Firesetting Offense(s) <sup>d</sup> (%)	14.0	18.4
--	------	------

*Note.* Violent Offenses refer to offenses against the person only.

<sup>a</sup>Missing data (35% FIPP, 33% TAU) <sup>b</sup>Missing data (13% FIPP, 20% TAU) <sup>c</sup>Missing data (9% FIPP, 51% TAU) <sup>d</sup>Missing data (9% FIPP, 51% TAU).

\*  $p < .05$

Table 2

Analysis of Primary and Secondary Outcome Measures Following Group Assignment to FIPP Treatment ( $n = 54$ ) or Treatment as Usual ( $n = 45$ ).

	Time 1 Baseline <i>M</i> (SD)		Time 2 Follow Up <i>M</i> (SD)		Meaningful Change (ES ≥.50) %		Time 3 Follow Up <i>M</i> (SD)		Time 1 vs. Time 2 Intervention x Time
Primary Measures	FIPP	TAU	FIPP	TAU	FIPP	TAU	FIPP	TAU	
Fire									
Fire Factor Scale (28-150; α = .87, <i>r</i> = .76)	58.8 (13.3)	54.5 (12.6)	53.1 (13.5)	54.2 (11.8)	38.9	15.6	53.3 (14.3)	57.4 (16.0)	<i>p</i> = .01, η <sub>p</sub> <sup>2</sup> = .06
FRPQ Awareness (0-18; α = .85, <i>r</i> < .2)	6.9 (4.5)	3.5 (3.5)	9.8 (3.7)	4.1 (4.3)	37.0	24.4	9.3 (3.3)	7.2 (4.9)	<i>p</i> = .19, η <sub>p</sub> <sup>2</sup> = .02
FRPQ Strategies (0-14; α = .84, <i>r</i> < .2)	5.4 (3.7)	2.9 (2.4)	8.0 (3.3)	3.5 (3.1)	44.4	26.7	8.2 (3.1)	6.2 (4.2)	<i>p</i> = .09, η <sub>p</sub> <sup>2</sup> = .04
Secondary Measures									
Offense-Supportive Cognition									
MCAA Violence (0-12; α = .90, <i>r</i> = .82)	5.3 (4.0)	5.2 (3.9)	3.8 (3.9)	5.0 (4.2)	42.6	24.4	3.5 (3.8)	4.8 (4.1)	<i>p</i> = .03, η <sub>p</sub> <sup>2</sup> = .05
MCAA Entitlement (0-12; α = .66, <i>r</i> = .73)	6.2 (2.7)	6.0 (2.6)	5.5 (2.7)	5.9 (2.9)	33.3	24.4	5.7 (2.8)	6.2 (2.6)	<i>p</i> = .30, η <sub>p</sub> <sup>2</sup> = .01
MCAA Antisocial (0-12; α = .88, <i>r</i> = .74)	5.5 (3.8)	5.8 (3.8)	3.9 (3.6)	5.9 (4.1)	44.4	33.3	3.9 (3.5)	5.8 (4.5)	<i>p</i> = .006, η <sub>p</sub> <sup>2</sup> = .08
Emotional Regulation									
Locus of Control (0-40; α = .78, <i>r</i> = .62)	17.0 (5.6)	13.5 (5.6)	15.3 (6.0)	13.8 (6.4)	40.7	33.3	14.6 (5.9)	14.7 (7.1)	<i>p</i> = .06, η <sub>p</sub> <sup>2</sup> = .04
NAS Total (48-144; α = .96, <i>r</i> = .84)	86.3 (19.8)	90.9 (19.6)	83.3 (20.9)	88.9 (19.8)	25.9	24.4	80.6 (20.9)	85.2 (21.5)	<i>p</i> = .69, η <sub>p</sub> <sup>2</sup> = .002
NAS Regulation (12-36; α = .82, <i>r</i> = .58)	86.3 (19.8)	90.9 (19.6)	83.3 (20.9)	88.9 (19.8)	44.4	31.1	80.6 (20.9)	85.2 (21.5)	<i>p</i> = .08, η <sub>p</sub> <sup>2</sup> = .04
PI (25-100; α = .95, <i>r</i> = .74)	50.6 (13.3)	52.0 (11.7)	47.7 (13.5)	51.1 (11.2)	25.9	26.7	47.2 (12.8)	51.2 (11.7)	<i>p</i> = .31, η <sub>p</sub> <sup>2</sup> = .01

Social Competence									
Loneliness (20-80; $\alpha = .90$ , $r = .64$ )	44.9 (11.4)	41.9 (12.1)	42.0 (10.4)	42.2 (11.0)	37.0	26.7	41.0 (10.3)	41.3 (11.6)	$p = .09$ , $\eta_p^2 = .03$
Assertiveness (19-114; $\alpha = .81$ , $r = .74$ )	69.9 (16.2)	72.2 (15.4)	73.8 (16.7)	72.2 (14.3)	37.0	22.0	72.4 (15.8)	72.9 (14.3)	$p = .10$ , $\eta_p^2 = .03$
CFSEI General (0-16; $\alpha = .85$ , $r = .49$ )	9.5 (4.0)	10.1 (4.1)	11.2 (3.7)	11.4 (3.8)	29.6	33.3	11.2 (3.5)	9.8 (5.1)	$p = .58$ , $\eta_p^2 = .003$
Impression Management									
BIDR (20-140; $\alpha = .79$ , $r = .71$ )	77.9 (21.2)	73.1 (20.7)	83.1 (21.2)	72.4 (19.1)	--	--	85.1 (23.1)	75.0 (24.5)	$p = .10$ , $\eta_p^2 = .03$

Note:  $r$  = test retest reliability calculated using Time 1 and Time 2 TAU scores. FRPQ = Fire Relapse Prevention Questionnaire; MCAA = Measure of Criminal Attitudes and Associates; NAS = Novaco Anger Scale; PI = Provocation Inventory; CFSEI = Culture-Free Self-Esteem Inventory, BIDR = Balanced Inventory of Desirable Responding. Time 3  $N$ s = 47 and 13 for the FIPP and TAU groups respectively.