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A preliminary firesetting offence chain for adults with intellectual and other developmental disabilities

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ABSTRACT

Background: The theoretical understanding of firesetting behaviour has predominantly been developed with men in prisons or psychiatric hospitals without neurodevelopmental disabilities. Consequently, there is a lack of evidence regarding the validity of current theory when applied to adults with intellectual disabilities and/or autism.

Method: Thirteen adults in England with intellectual and other developmental disabilities were interviewed about the affective, cognitive, behavioural, and contextual factors leading up to and surrounding a recorded firesetting incident. Interviews were analysed using a Grounded Theory approach.

Results: The resulting model consists of four phases: (1) background, (2) early adulthood, (3) pre-offence period, and (4) offence, and post offence period.

Conclusion: The model accounts for unique precursors to firesetting including mental health deterioration, poor problem solving, and new motivations for firesetting. Unlike other offence chain theories, the significance of post-offence behaviour and cognitions are highlighted.

KEYWORDS

Arson; firesetting; intellectual disabilities; autism

Statistics suggest that in December 2020, there were 525 adults ($n = 382$ males, $n = 142$ females) with a conviction for Arson detained under Part III of the Mental Health Act (2007) in hospitals across England and Wales (Ministry of Justice, 2020). Evidence suggests at least 0.4–1.4% of adults who set fires have intellectual disabilities (Devapriam et al., 2007; Ritchie & Huff, 1999), but there are no published theoretical developments to date that adequately explain the factors contributing to an act of firesetting for this population. This could be problematic considering they may have unique characteristics and treatment needs (Collins et al., 2021; Courtney et al., 2006). Several multifactorial theories of firesetting have already been developed, including the Functional Analysis Theory (Jackson et al., 1987), Dynamic Behaviour Theory (Fineman, 1980, 1995) and Multi-Trajectory Theory of Adult firesetting (M-TTAF; Gannon et al., 2012). Research highlighting single factors relevant to firesetting behaviour include the Psycho-Analytical Theory (e.g., Freud, 1932), Biological Theorists (Virkkunen, 1984; Virkkunen et al., 1995; Virkkunen et al., 1987) and Social Learning Theory (e.g., Bandura, 1976; Kolko & Kazdin, 1986; Singer & Hensley, 2004).

However, single factor theories do not consider the complex interaction between historical and proximal factors that lead to deliberate firesetting.

Micro-level theories describe an offence as it unfolds across time, specifying the cognitive, behavioural, motivational, and social factors associated with offending behaviour (Ward & Hudson, 1998). Two micro-level theories have been developed to explain firesetting behaviour and are described as the Firesetting Offence Chain for Mentally Disordered Offenders (FOC-MD; Tyler et al., 2014) and the Descriptive Model of Adult Male Firesetting (D-MAF; Barnoux et al., 2015). Authors highlighted links between firesetting behaviour in adults and developmental factors (e.g., behavioural difficulties, experiences of trauma/abuse, relationship difficulties), psychological and personality traits (e.g., impulsivity, aggressive traits, maladaptive coping strategies, emotional regulation difficulties), psychopathology (i.e., mental health difficulties), and offence specific characteristics (e.g., an excessive interest in fire). While the samples in both Tyler et al.'s (2014) and Barnoux et al.'s (2015) offence chain models included a small number of individuals who reported additional learning needs, neither model included

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individuals who had been diagnosed with a developmental disability, nor were these theories devised with this population in mind. Current theory does not adequately capture factors more relevant to individuals with developmental disabilities (e.g., social stigma, poor problem solving, communication difficulties; Chaplin et al., 2017; Gausel & Thørrisen, 2014; Salekin et al., 2010). As such, theories may require further conceptualisation to account for this population.

The aims of the current research are to: (i) validate Barnoux et al.'s (2015) and Tyler et al.'s (2014) micro-level theories of adult firesetting with a sample of adults with intellectual and developmental disabilities who have set fires; and (ii) offer a preliminary unified descriptive model of the offence chain for adults with intellectual and other developmental disabilities who set fires.

Method

Participants

Thirteen adults with intellectual and other developmental disabilities (12 males, 1 female) who had a history of deliberate firesetting behaviour were recruited from three low secure inpatient units ($n = 6$), one medium secure unit ($n = 3$), two locked rehabilitation units ($n = 3$) and one supported living service ($n = 1$) in England. Age ranged from 21 to 52 years

($M = 34.31$; $SD = 10.27$) and all participants identified as White and British. The Full-Scale Intelligence Quotient ranged from 51 to 97 ($M = 66.08$; $SD = 13.81$). Index Offences reported included Arson ($n = 8$), Sexual Offending ($n = 1$), Property Damage with Intent to Endanger Life ($n = 1$), Assault ($n = 2$), and Possession of an Offensive Weapon and Explosive Substances ($n = 1$). Participants without an index offence of Arson had either a previous conviction for Arson ($n = 2$), been cautioned for Arson ($n = 1$) or had a history of un-convicted firesetting ($n = 2$). Number of previous convictions for firesetting ranged from 0 to 6 ($M = 0.75$; $SD = 1.71$). Number of previous offences (not necessarily related to firesetting) ranged from 0 to 10 ($M = 2.15$; $SD = 3.46$). All participants had a diagnosis of intellectual disability ($n = 9$), Autism ($n = 2$), or both ($n = 2$) (see Table 1).

Procedure

The study was approved by the Health Research Authority and Social Care Research Ethics Committee (IRAS Ref: 255255). Informed consent was obtained for each participant. Demographic and background information (i.e., offence related information) was collected via self-report questionnaire. A semi-structured interview schedule was adapted from schedules used in previous offence process research (e.g., Tyler et al., 2014). Participants were asked to describe their childhood and adult experiences and detail the events, thoughts, and feelings leading up to, surrounding, and immediately following a recorded firesetting incident. Twelve interviews were recorded via digital audio recorder before being transcribed verbatim, and detailed notes were made for one interview (M length = 44.08 min; $SD = 9.33$). To assure data validity, the background questionnaires were verified by the patient's Responsible Clinician to ensure the accuracy of the information provided.

It was important for authors to firstly determine whether current micro-level theories could be applied to adults with intellectual and other developmental disabilities, before deciding whether it was necessary to develop a new preliminary theory to account for the unique needs of this population. The process for analysis was separated into two steps. Firstly, an inductive approach using grounded theory to code transcripts (Strauss & Corbin, 1998) was taken to ensure any new categories, properties, and relationships between conceptual components were identified. Secondly, a more deductive approach was then used to determine whether concepts identified in the transcripts were present in the offence chains of imprisoned males and adults with a

Table 1. Participant demographic information.

Participant	Age	Full Scale IQ	Documented psychiatric diagnosis
1	35	69	Dissocial Personality Disorder, Emotionally Unstable Personality Disorder, Intellectual Disability
2	46	58	Mixed Personality Disorder, Hyperkinetic, Mild intellectual Disability
3	25	58	Paedophilia, Mild Intellectual Disability
4	52	61	Emotionally Unstable Personality Disorder, Autism Spectrum Disorder, Mild Intellectual Disability, Non-organic Psychotic Disorder
5	23	90	Dissocial Personality Disorder, Autism Spectrum Disorder
6	26	59	Mild Intellectual Disability, Attention Deficit Hyperactivity Disorder
7	46	58	Intellectual disability
8	33	64	Mild Intellectual Disability, Autism Spectrum Disorder
9	47	97	Autism Spectrum Disorder, Paranoid Schizophrenia
10	34	59	Mild Intellectual Disability
11	21	51	Intellectual Disability, Attention Deficit Hyperactivity Disorder, Communication Issues
12	29	NR	Mild Intellectual Disability, Attention Deficit Hyperactivity Disorder
13	29	69	Paranoid Schizophrenia, Intellectual Disability

Note: NR = Not reported.

mental disorder as reported in previous research (Barnoux et al., 2015; Tyler et al., 2014).

Step One-Model Validation. Grounded Theory (Strauss & Corbin, 1998) was used to analyse each participant's offence chain narrative for all interviews ($n = 13$). Grounded Theory is a set of systematic qualitative procedures that use the logic of induction to move from the detail of individual cases to a theoretical model that represents all cases under consideration (Strauss & Corbin, 1998). Data were broken down into conceptual components (termed open coding). Inter-rater reliability (IRR) checks were conducted on the meaning units of two transcripts by the second author to assess the reliability and validity of the open coding (IRR = 85.8%), suggesting almost perfect agreement (Landis & Koch, 1977). To ensure ratings were as independent as possible, the second rater was blind to where the first had positioned their meaning units. Any differences were discussed until an agreement was reached.

Secondly, a deductive approach was taken during the model validation stage. Authors attempted to map the conceptual components onto the existing categories of current firesetting offence chain models. This process acted as a test of scope and completeness (i.e., saturation; Ward et al., 1998). However, new categories, properties, and relationships between conceptual components were evident. A total of 25 (49%) categories that constitute the FOC-MD (Tyler et al., 2014), and 24 (42%) categories that constitute the D-MAF (Barnoux et al., 2015) were applicable to the current sample of adults with intellectual and developmental disabilities. However, 13 concepts identified within the primary data during open coding could not be accounted for by the two existing models. This test of validity indicated that neither the D-MAF or FOC-MD could sufficiently account for the offence chains of adults with intellectual and other developmental disabilities who set fires.

Step Two-Theory Refinement. Categories from the FOC-MD (Tyler et al., 2014) and the D-MAF (Barnoux et al., 2015) applicable to the current sample were refined and further developed to account for areas of conceptual overlap. New concepts and categories, unique to the offence chain narratives of adults with intellectual and other developmental disabilities, were added and those that did not apply were removed (see supplementary data – Table 2). Each category of the adapted model, and the relationships between categories were reviewed until agreement was reached between the first and second author (i.e., axial coding; Strauss & Corbin, 1998). This led to the development of a preliminary adapted model for adults with intellectual and other developmental disabilities who set fires.

After analysis of nine interviews, no new information or categories in the data emerged in the subsequent four interviews, suggesting saturation had been achieved. In grounded theory, data saturation occurs when no new or relevant data are emerging regarding a category, when the development of the category's properties and dimensions can withstand variations in the context of the phenomenon, and when the relationships among categories are well established (Morse, 1995). However, the notion of "absolute" theoretical saturation is questionable, as findings are forever tentative and open to modification (Morse, 1995).

Results

The current model is divided into four main phases: (i) *Background Factors*; which account for historical factors in the person's childhood and adolescence, (ii) *Early Adulthood*, (iii) *Pre-Offence Period*; factors that occur in the person's early adulthood and in the period up until immediately prior to the fire, and (iv) *Offence and Post Offence Period*; factors that occur during and immediately after the fire. Factors unique to adults with intellectual and other developmental disabilities are shaded in the model diagrams below (see Figures 1–4).

Phase 1: Background factors (Figure 1)

Childhood environment. Caregiver environment and social environment was relevant, and caregivers included primary (e.g., biological parents) and secondary (e.g., foster carers, step-parents) carers. A minority of participants ($n = 3$) reported a positive caregiver experience (i.e., relatively stable home environment, positive relationships with caregivers). For example, one participant reported having contact with both their parents during childhood, stating, "My father was a butcher. He had a business, so I used to see him ... [I lived with] My mother all my life". Another participant recalled his childhood environment as positive, stating, "I know it sounds awful but it's just. I have never had trouble with parents or that. Never been abused when I was a kid." Caregiver experiences were identified as negative for the majority of participants ($n = 10$) and were characterised by poor interpersonal relationships with at least one caregiver, instability, adverse events, separation, and caregiver mental health issues and/or substance misuse. For example, one participant reported:

My mum and dad split up when I was really young. I can't remember when they split up to be honest, I was

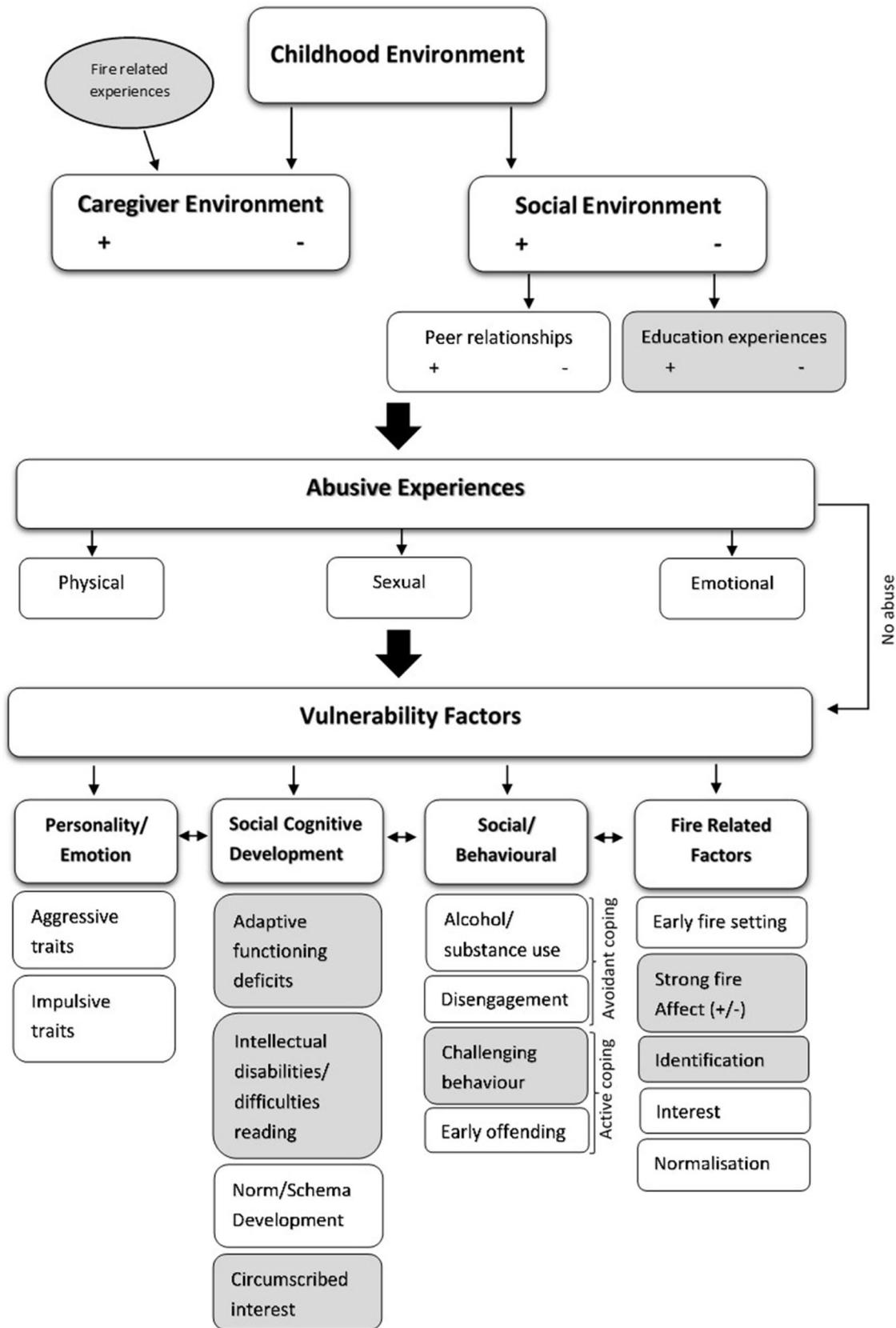


Figure 1. Phase 1: background factors.

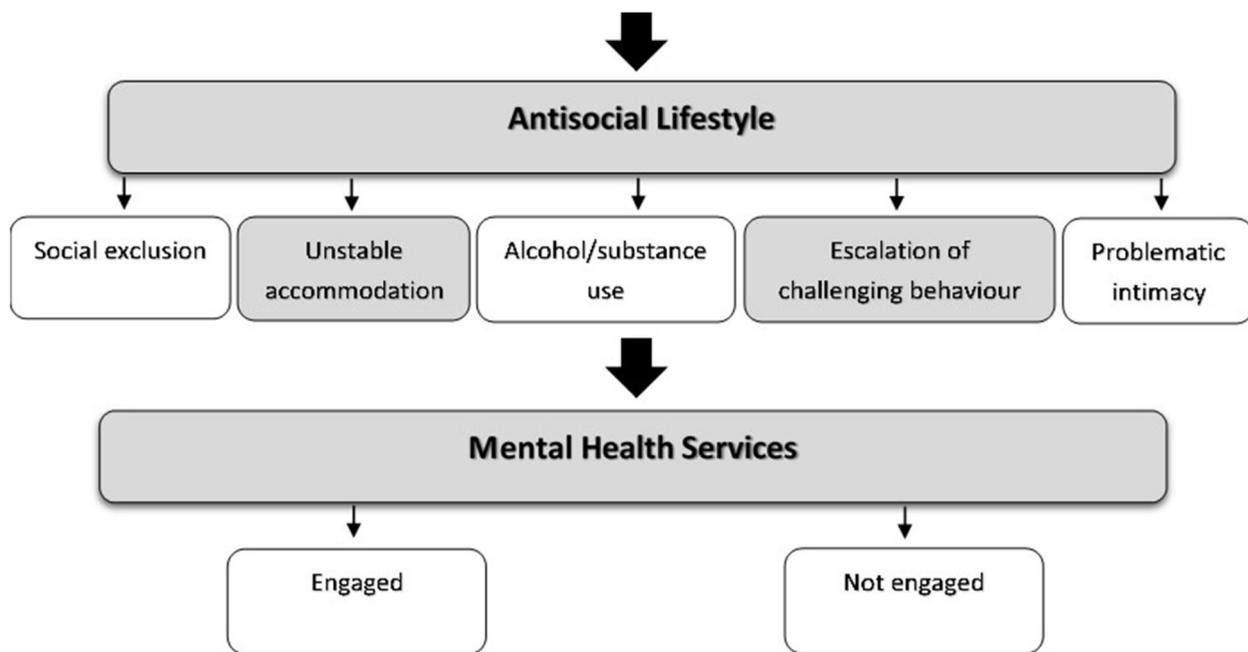


Figure 2. Phase 2: early adulthood (aged 18+).

that young. My mum met someone; she met another guy in a pub. She met him. His name was xxx. But he then obviously got arrested for being, he done sexual things to me and to other people, other young and vulnerable people. So, yeh he got arrested and put into prison for that. So that happened.

Most participants who experienced negative caregiver environment described having been removed from their primary caregivers during childhood and adolescence ($n = 7$). Participants who were removed from their caregivers were taken into social care ($n = 5$) and/or taken to live with extended family ($n = 4$). For example, one participant described how they “grew up around all different places really. I have been moved around place to place, pillar to pillar. Children’s homes, foster care, adoption ... Yeh been in care all my life. Been in children’s homes, foster care, foster families. You name it I have been in it. There is never a place I have not been in”. Three participants remained with one biological parent and three participants remained with both biological parents. Some participants were periodically separated from their parents on more than one occasion ($n = 5$). Bereavement of a caregiver during childhood and adolescence was highlighted as a type of negative caregiver experience for a minority of participants ($n = 2$).

The caregiver environment was characterised by fire-related experiences for 46% of participants ($n = 6$), which included witnessing fires being set by a primary caregiver ($n = 4$), witnessing a caregiver being injured by fire ($n = 1$), early firesetting under the supervision of a primary caregiver ($n = 3$), and/or

having a caregiver who was employed as a firefighter ($n = 2$). For example, one participant recalled having played with candles from a young age, “I think I was 12. 10 or 12. I think I was that age. Probably younger to be honest because I remember my dad telling me that I used to mess around with candles when I was really young”, and also witnessing other family use fire reporting:

Sometimes I would stay at my nan’s for a little while and me and my uncle would light a fire in the garden and set a bonfire in the garden and burn all the rubbish so yeh it was fun ... from previous experience from bonfire nights and stuff my dad used petrol and its gone bomb ... that is what I did with my uncle once because he got caught on fire on bonfire night. His leg got caught alight and I noticed it and I said to him your legs on fire, and I had the hose, and I just sprayed his leg with the hose.

Another participant reported:

Growing up I always looked up to my uncle quiet a lot. He was a fireman and I always wanted to be like him, and it was always doing good and stuff and from that young age a sense of belonging and being part of something good and something bigger but after setting fires, it is hard to describe, I don’t know.

Social environment. The social environment of participants was characterised as either positive ($n = 6$) or negative ($n = 7$). A positive social environment referred to positive peer relationships (i.e., positive socialisation; $n = 8$) and a positive educational experience ($n = 6$) such as regular attendance at school, well supported by

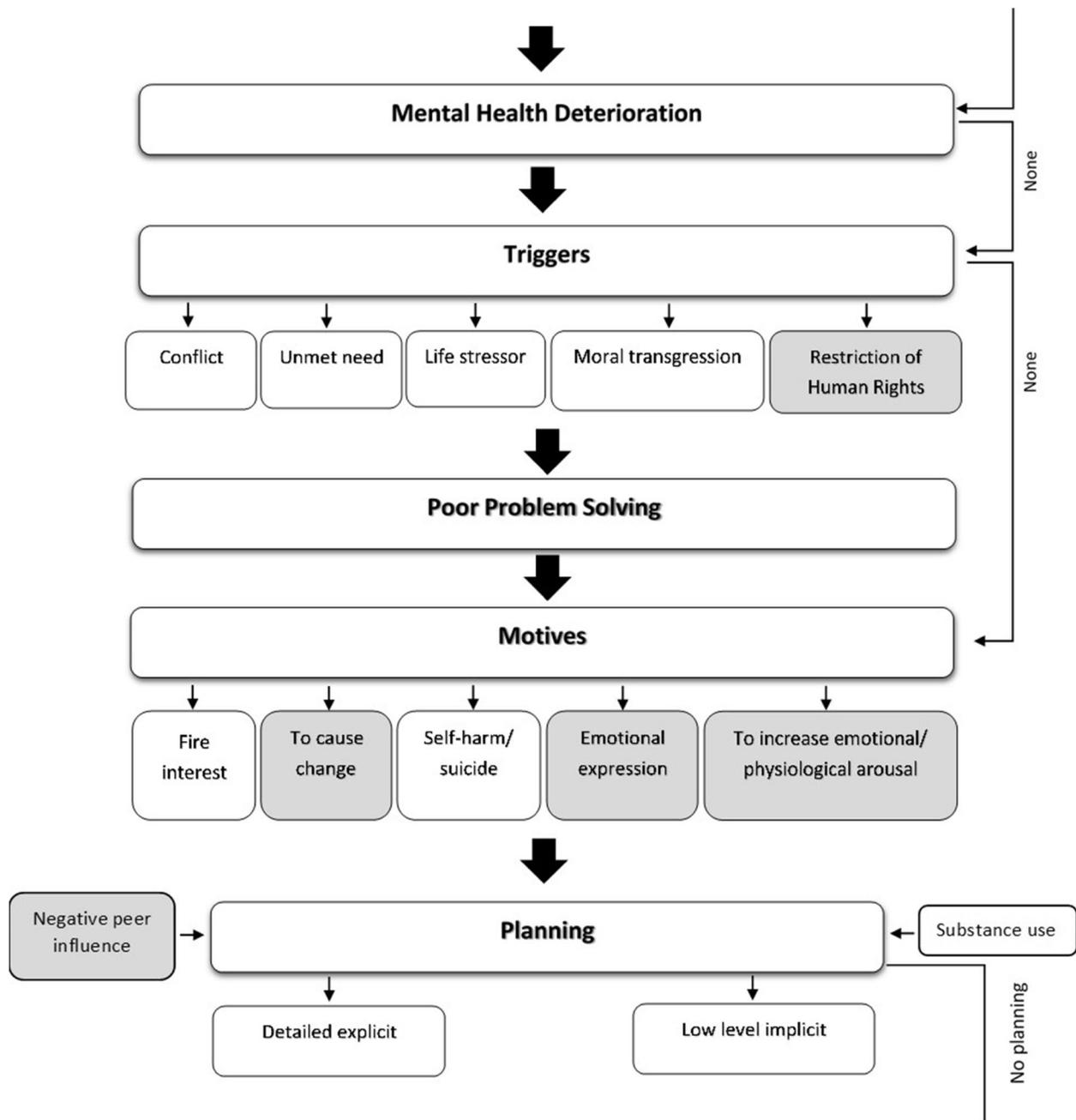


Figure 3. Phase 3: pre-offence period.

teachers, and positive feelings towards school. For example, one participant recalled his daily routine reporting, “Went home. Done my homework. Went out with friends. and then went home for about 7 o clock. Went to bed and got up the next day and went to school”. Another participant recalled a positive experience at school and during an interaction with teaching staff, stating:

I used to like mathematics. I like mathematics an history. I used to do history in school and the teacher said you are very clever with history because I was

getting involved with all about the history about the world. They gave me a paper for mathematics and for history.

In contrast, a negative social environment ($n = 5$) referred to negative peer relationships, whereby participants were influenced towards antisocial behaviour (e.g., truancy), affiliated with a gang culture, or experienced social exclusion (i.e., a lack of friendship formation). For example, one participant described the antisocial behaviour his witnessed in his local neighbourhood during childhood stating, “I would say, in

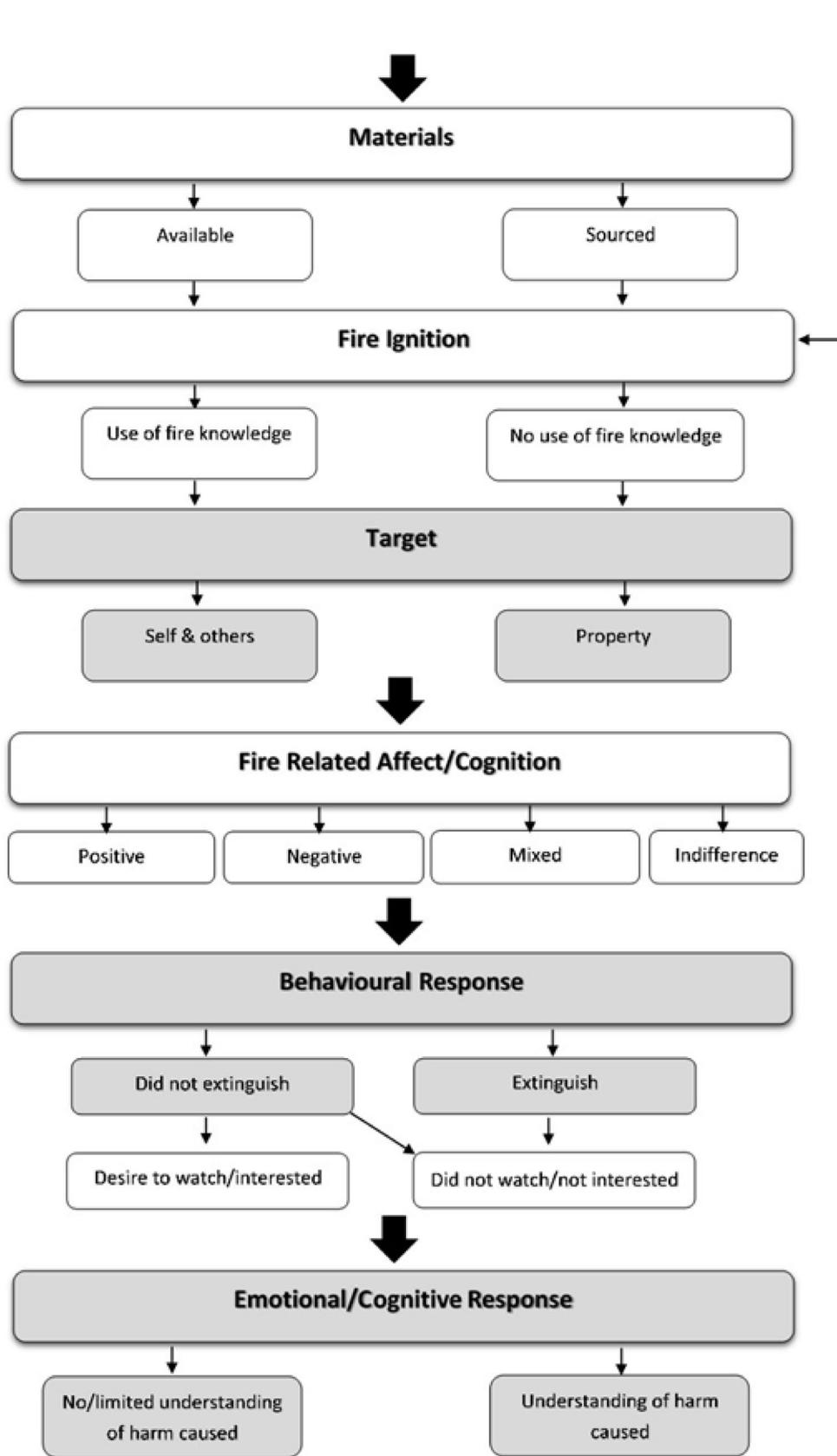


Figure 4. Phase 4: offence and post offence period.

the area where I was living there was lots of crime, drug dealing, gangs, a lot of high tension". The same participant also reported travelling in a larger group and being aware of gang activity, stating "Quite a big group. We always travel in big groups in xxx because it is quite high in gang activity. It was a gang environment to live in". Negative educational experiences ($n=7$) referred to experiences of multiple school placements, exclusion from school, lack of support at school, and negative feelings towards school. For example, one participant reported, "As I grew up, I just went from school to school ... I went to loads of different schools".

Abusive experiences. Most participants ($n=11$) experienced abuse perpetrated by someone known to them during childhood and adolescence. Types of abuse included: (i) physical ($n=5$), in form of excessive physical punishment or physical conflict with adults, (ii) emotional ($n=10$), in the form of verbal or psychological abuse, bullying by peers, witnessing domestic violence, or neglect and, (iii) sexual ($n=3$). For example, one participant reported:

One of them [mum's partner] I kind of got along well with, the others I didn't. One in particular I didn't get along with. He was a junkie and threatening and violent. Never hit me or anything but he was a big block. This was before we got kicked out so I would have been like nine, ten. He became quite aggressive and threatening when he was drunk and at that age it was quite scary.

Another participant reported multiple forms of abuse over many years, stating:

I have been through hell and back so it's not just because of what my stepfather did to me it is also what they did to me at the children's homes and certain other places. So, yeh I have been bullied and abused, sexual abused ... Physical [abuse], kicked, punched, you name it I have been through all sorts.

Some participants experienced multiple forms of abuse ($n=5$), while two participants reported no abuse.

Vulnerability factors. Several psychological vulnerabilities appeared to arise from participants' environments and abusive experiences and were further exacerbated by a developmental disability and/or mental health problem (i.e., intellectual disabilities, autism, attention deficit hyperactivity disorder).

Personality/emotion. Personality traits emerged and were interpreted as potentially problematic for later phases in the offence process, including aggressive traits (e.g., anger; $n=10$), and impulsive traits (e.g., boredom proneness, thrill-seeking tendencies; $n=6$). For example, one participant recalled acting impulsively in response to conflict with a peer stating, "When he

grabbed hold of me it just made me snap ... That is the problem when someone throws a punch at me, I get really angry and that's it I snap."

Social cognitive development. All participants demonstrated potentially problematic areas of social cognitive development including, (i) intellectual disabilities or difficulties reading; $n=11$, (ii) adaptive functioning deficits (i.e., social skill deficits, communication problems, poor problem-solving abilities, poor budgeting skills, life skills difficulties; $n=10$), (iii) circumscribed interests (i.e., special interest in the military, emergency services, weapons, or explosives; $n=2$), and (iv) norm/schema development ($n=4$). One participant recalled having difficulties with his verbal speech during childhood, recalling a specific time when he had difficulties communicating his needs stating "I was watching the TV and you know when you're like can't talk out loud, but you think that you can talk in your head ... I wanted to say it, but I couldn't because everything that I wanted and everything I wanted to do I just kept pointing and saying 'der' all the time. Everyone took the mick out of us over it". Such difficulties may predispose participants to engage in offending behaviour, including seeing violence ($n=4$), and offending as normal ($n=3$), while constructs such as loyalty were distorted in support of criminal behaviour ($n=2$). For example, one participant spoke about his allegiance to his family and friends, stating "See if it is me, I am not bothered what would happen to me but when it comes to my family and friends, I am always there for them, that is just who I am".

Social and behavioural. Participants seemed to use a combination of avoidant and active coping strategies. Avoidant coping strategies included: (i) alcohol and substance use ($n=8$) and (ii) disengagement, including self-isolation, absconding and truancy ($n=5$). For example, one participant reported that to cope with a difficult situation, "I tried running away but that didn't do anything". Another participant found school challenging, particularly interpersonal relationships and managed these difficulties by not attending:

I didn't really have much of a normal school like really. I went to God knows how many different schools. All in the same area. It was quite a big town so there were a few different schools, so I went to those different schools. I had issues, didn't want to go to school, making friends with people, bullying and stuff. I always had issues with school. Always. I missed a lot of school as well ... Depends. My mum would sometimes keep me out of school. I would just go home doing nothing really. Probably some of the times set fires. Secondary school and stuff when my family didn't know that I was skipping school.

Active coping strategies included challenging behaviour ($n = 9$) and early offending ($n = 2$). For example, one participant reported using violence against peers, stating:

Sometimes I would deal with it in not such a good way, sometimes when I was younger, I used to just hit them because it was the only way I could see of dealing with them so yeh I used to get into fights because of bullying so got into scraps with people.

Fire-related factors. Fire-related vulnerability factors developed during childhood or adolescence and included early firesetting ($n = 8$), strong fire affect ($n = 3$), identification ($n = 2$), an excessive interest in fire¹ ($n = 3$), and normalisation ($n = 2$). For example, one participant reported, “I just loved lighting fires ... when I shut my eyes, I see flames in my eyes”. The majority of participants had at least one of these fire factors emerge during childhood or adolescence ($n = 10$). Early firesetting included, “Like setting bins on fire. Stuff like that.”. Similarly, another participant recalled having “Played with fire yeh. Matches yeh. Set fire to dustbins, things like that”.

Phase 2: Adulthood experience (Figure 2)

Adulthood experiences reflect participants’ experiences from the age of 18 up to their incident of firesetting behaviour.

Antisocial Lifestyle. All participants appeared to have a lifestyle outcome that was antisocial: (i) social exclusion ($n = 9$), characterised by an absence of meaningful relationships and engagement in meaningful activity; (ii) problematic intimacy ($n = 12$), whereby participants reported unhealthy relationships with peers, support staff and/or family; (iii) unstable accommodation ($n = 10$), whereby participants reported living in hostels or other temporary residential placements in the community; (iv) alcohol/substance misuse ($n = 8$); and (v) an escalation of offending/challenging behaviour ($n = 7$), whereby participants reported an increase in frequency and/or severity of challenging behaviour (i.e., aggression, self-harm), offending behaviour (e.g., violence), or setting fires. For example, one participant reported, “Then as I got older, I moved around quite a lot, moved to different places”. A second participant recalled living in hostels as an adult and living in an antisocial environment:

When I was living in hostel. People around me selling drugs, things like that. And they were smoking in my room, and they were drinking around me. I would have a couple every now and again, but they were smoking stuff around me.

Mental Health Services. A minority of participants reported being engaged with mental health services in the community during early adulthood ($n = 2$). One participant reported having engaged with a mental health service professional once a month, “I had been coming here for, not here but going to the other place to speak to one in xxx. They have got someone to talk to ... About once a month”. Similarly, the second participant recalled being assessed by a mental health professional:

I don’t know what that was caused by, so I have done that since I was younger, and I got assessed and came back saying that I have got a split personality and also got the mind of a ten-year-old and it all just gathered up on us over the years. It does scare me. I am afraid of it. What’s the odds of what is going to happen to me next?

Phase 3: Pre-offence period (Figure 3)

Mental Health Deterioration. The pre-offence period refers to the period spanning from approximately one year before the fire up to immediately prior to the fire and describes factors that occurred during this period. The majority of participants ($n = 12$) self-reported some level of mental health deterioration prior to setting the fire, including increased anxiety, depression, suicidal thoughts, paranoia, and hallucinations. One participant recalls how their mental health deteriorated stating:

My mental health went down after a while as I got older it went downhill a little bit. I was trying to kill myself for quite a while, but I could never do it. I think that is because of my mum to be honest. Yeh I was getting knives out of the kitchen drawer and wanting to cut my wrists, but I couldn’t do it. Just couldn’t do it for some reason. There is a thing in my head that stops me from doing it. Weird.

A second participant described his mental health deterioration as a “nervous breakdown and then after that it was just kind of changed. Going down. Getting angry, getting upset, getting frustrated, depressed”. Another reported being depressed and anxious, stating:

I think I was really depressed looking back now. I knew there was problems, but I wasn’t able to sit there and go it is depression, it is anxiety. I have always had problems with anxiety growing up, which looking back now I can kind of go yeh that was anxiety.

One participant did not report any problems with their mental health prior to setting the fire.

Triggers. Most participants experienced multiple triggers prior to their firesetting incident ($n = 8$). Triggers included conflict ($n = 4$), unmet need ($n = 9$), life stressor ($n = 6$), moral transgression ($n = 3$), and

restriction on human rights ($n = 5$). Conflict was most frequently with support staff, neighbours, family, and peers. Unmet need most frequently reflected a wish for additional support or not feeling heard. Life stressors included bereavement, parental ill-health, being a victim of crime and/or being bullied. Moral transgression referred to feelings of injustice, for example, one participant recalled feeling “betrayed” and “punished for things I didn’t do”. Participants who reported a restriction on human rights were living independently ($n = 1$), in supported accommodation ($n = 3$), or at a hostel ($n = 1$). Participants living in supported accommodation reported negative experiences, including having a lack of independence and control over important areas in their life (i.e., accommodation, food, and finances). For example, one participant reported that they felt “controlled rather than cared for” and they “didn’t like all the rules”. A second participant experienced a lack of independence because of, “how they [staff] do everything for you. Like they keep your money... they cook for you... I would say what is for dinner and they would say wait and see... I never got to decide what I had for dinner”. Despite living independently, one participant felt a lack of control as he perceived the police as a threat to his independence, reporting that they were forcing him to move to another area. This participant also reported having no control over the relationship with his son as he was prevented from having any contact with him.

Poor Problem Solving. Following a trigger, 12 participants demonstrated poor problem-solving skills, characterised by an inability to source appropriate support, difficulties coping with negative interpersonal relationships and/or problematic rumination.² For example, one participant’s firesetting was triggered by an incident in which he felt betrayed and a sense of injustice due to being unfairly punished. Prior to setting a fire, the participant reported thinking repeatedly about the incident that had occurred that day, in addition to historical incidents of abuse and reported, “I was angry. I was pissed off not just about being grassed up but about what happened and what’s been going on over the years”. Several participants set a fire because they were experiencing inter-personal difficulties and wanted to move accommodation, therefore demonstrating poor problem-solving skills. For example, one participant reported:

I was in locked rehab and I ran away because I was getting bullied. Because I couldn’t explain it to people I ran away and set the fire so the police arrested me for it and in interview I explained the reasons why to the police so they could help me.

Motives. Triggers led to motives for offending including, to cause change ($n = 3$), fire interest ($n = 1$), suicide or self-harm ($n = 2$), emotional expression, including anger, frustration, distress ($n = 10$), and to increase emotional and physiological arousal ($n = 2$). Interestingly, the most prevalent motives reported by adults without intellectual and other developmental disabilities (e.g., revenge, crime concealment, economic gain) were not reported by participants. This is depicted by one participant who reported, “I didn’t go out there to kill anyone or harm anyone”. Another participant recalled their firesetting as a way to cope and express their emotions, reporting, “My friend was taking the piss out of my speech, and I didn’t like it so I walked out of the pub. I walked away and set fire to the mattress”. One participant who had a motive of fire interest was also motivated by a desire to increase emotional/physiological arousal (e.g., excitement, sensory stimulation) and had developed several fire-related vulnerabilities during childhood and adolescence such as early firesetting, strong fire affect, identification with fire, and normalisation of fire. For example, one participant reported a particular interest in the emergency services, military and described:

A lot of it interests me including firearms police they always interest me. It is generally the whole military aspects I like. I love the military; completely love it and the way the police went into the building is interesting. It is like a dance.

Planning. Planning was proximal for all participants and occurred within a few days to a few minutes before the offence. Three main types of planning were apparent in the data: detailed explicit, low level implicit, and no planning. Detailed explicit planning ($n = 5$) those who acknowledge explicitly planning to set the fire. These participants generally planned to set the fire several hours/days before the offence (e.g., sought materials, visited location). For example, one participant reports sourcing materials with peers to make “Molotov cocktails”. Low level explicit planning ($n = 1$) refers to some explicit planning of the offence, but this occurred immediately prior to setting the fire (i.e., an hour to minutes before), for example, deciding to use accelerants or ignition sources that were available on arrival at the scene. For example, one participant recalled:

I don’t know I guess one thing was fuel and there was a lot of fuel in this [vehicle], carpet and sticks that would burn... We do put some things in there though before we lit it. We put some big timbers, massive. We put some of them in there. We put them on the seat.

None ($n = 7$) describes participants who did not report any planning of the offence. Firesetting for these

participants was generally impulsive or opportunistic (i.e., the fire was set because there was an available opportunity rather than a pre-planned target and/or method of firesetting). Most autistic participants (75%) showed detailed explicit planning for the firesetting ($n = 4$) in contrast to none of the participants with ADHD/hyperkinetic disorder, who instead reported having done no planning ($n = 4$). Peer influence and substance misuse (e.g., drugs and alcohol) both emerged as having a direct influence on planning. For example, one participant recalled “My friend suggested that, so he made the petrol bomb and threw it inside the [vehicle]”. Another participant recognised the links between their substance use and firesetting behaviour reporting, “It caused problems because when I set fires, I was drinking too much”. For example, participants who were intoxicated were more likely to set the fire on impulse ($n = 6$). A minority of participants ($n = 4$) were negatively influenced by peers at the time of planning and setting the fire and set the fire in the company of at least one other person. None of the participants who were influenced by peers had a history of offending behaviour.

Phase 4: Post offence period (Figure 4)

Materials. Materials used to set the fire were either sourced ($n = 4$) or available ($n = 9$). Unlike available materials, already at the scene of the crime and used impulsively, sourced materials were acquired ahead of the fire or immediately before and were therefore associated with planned rather than unplanned fires.

Fire ignition. The fire ignition aspect of the model refers specifically to how participants went about starting the fire. Two key subcategories within fire ignition were evident: use of fire knowledge and no use of fire knowledge. Participants who employed their use of fire knowledge when starting the fire ($n = 5$) used accelerants, specific flammable materials, and the application of specific knowledge or previous fire experience regarding igniting the fire. For example, one participant, when asked how he set the fire, stated, “We didn’t want to cause an explosion, so we removed the gas cylinder”. They were more likely to have used materials that were sourced prior to setting the fire (e.g., petrol). Participants who employed their use of fire knowledge all engaged in detailed explicit planning. Participants who did not use fire knowledge when starting the fire ($n = 8$) were more likely to use materials that were available (e.g., their own clothes, furniture) and had either set the fire out of impulse or opportunity (no planning) or had engaged in low level planning of the offence and were less likely to have developed fire-related risk factors in childhood.

Target. The target of the offence often became fully formulated shortly after any motive(s) had developed. For most participants, the target of the firesetting was someone else’s property ($n = 8$; e.g., public property, private property, vehicle, countryside), or their own property ($n = 4$). For one participant, the target of the firesetting was himself (i.e., suicide) and they had hoped to harm others. Participants who had more than two fire-related vulnerabilities were more likely to target the fire at someone else’s property rather than their own and light the fire outside their home environment.

Fire-related affect/cognition-fire. Some participants reported to have experienced fire-related affect and cognition while initially igniting the fire and immediately after. Four main subcategories were evident: positive, mixed, negative, and indifference. Positive affect/cognition experienced ($n = 3$) included pride, excitement, and a release of pressure (e.g., “it was at the time fun in that moment. It was fun you know, hence why I continued to go back to it for a while.”) and positive thoughts after having set fire (e.g., one participant set fire to an abandoned vehicle and reported feeling “Amazed how it burnt, especially the seat, that just got incinerated, the glass cracked and blew up, how the car, because this car was tracked, so amazing how this bit just went [explosion noise]”). Two participants experienced mixed affect/cognition ($n = 3$) and reported both positive and negative affect/cognition, which appeared to be competing with one another. One participant reported feeling “better” after having set the fire but also “disgusted” with himself. A second participant appeared to enjoy telling his narrative (i.e., he was smiling and laughing) but expressed the concern he had at the time and “hoped no one was hurt” by the fire. Six participants reported experiencing negative affect/cognition during the fire, which included regret, upset, and anger (e.g., “After I had set the fire, I felt angry and upset that I had damaged someone’s car ... when the police arrested me, I felt a bit upset and annoyed at myself”) and negative thoughts about the fire (e.g., “What the hell are you doing?”). Indifference ($n = 1$) refers to not experiencing any strong internal arousal (affective or cognitive) towards the fire (i.e., were not excited or scared by the fire – any overwhelming affect/cognition experienced generally related to the situation rather than the fire itself). This participant had diagnosed mild intellectual disability and autism, which may be related to challenges around recalling, identifying, or communicating an emotional or cognitive response to setting the fire, rather than an indifference in and of itself.

Behavioural response. This represents whether participants reported watching the fire and whether they

attempted to extinguish the fire. Most participants reported not being interested in watching the fire ($n = 10$) and had no more than one fire-related vulnerability factor. Three participants watched the fire as they were interested, all of whom did not attempt to extinguish the fire. Participants who watched the fire had at least one of the fire-related risk factors (i.e., fire interest, a strong fire affect, early firesetting). Those who extinguished the fire themselves prior to arrival of emergency services ($n = 3$) all showed no interest in watching the fire. For example, one participant reported, “No, [I didn’t watch the fire] we heard sirens and we legged it. Didn’t want to be around that area”.

Emotional/cognitive response. Most participants demonstrated no/limited understanding of harm caused ($n = 11$). For example, one participant reported “They [two firefighters] got injured putting the fire out but it is just one of those things”. The remaining two participants showed some understanding of harm caused by the fire and reported feeling remorse and regret, with one of the participants stating, “I regret what I did ... I am sorry for what I have done ... I wish I had never done it”.

Discussion

The development of a preliminary micro-level theory explaining the pathways to offending for adults with intellectual and other developmental disabilities who set fires represents the first important theoretical step towards informing the assessment and treatment of this population, therefore improving evidence-based practice. At each phase of the offence process, factors unique to adults with intellectual and other developmental disabilities emerged (e.g., vulnerability factors, motives, behavioural responses).

Current micro-level theories of adult firesetting were shown to be invalid for adults with intellectual and other developmental disabilities. Adults with intellectual and other developmental disabilities had a unique pathway to offending, although they were most alike adults with a mental disorder (as reported by Tyler et al., 2014), which is perhaps unsurprising given the high prevalence of comorbidity reported among the population. However, the background factors associated with adults who set fires do appear to be similar for imprisoned males, adults with a mental disorder and participants recruited to the current study, including experiences of abuse. These factors also appear to be associated with people who engage in other types of offending behaviour. For example, abusive experiences are frequently reported by people who commit a sexual offence (e.g., Craissati et al., 2002).

At phase one of the model, fire-related experiences, circumscribed interests in violence/emergency services, and caregiver environments that were characterised by fire-related experiences are highlighted as unique factors present in the backgrounds of participants. The presence of challenging behaviour as opposed to early offending behaviour among participants, together with the number of previous convictions reported, suggested participants who set fires were less likely to present with a long history of offending. Findings support more recent research in the field suggesting identification with fire is a significant predictor of firesetting and one of four key factors relevant to clinical practice (Gannon et al., 2013; Ó Ciardha et al., 2015). Unlike incarcerated adult males and adults with a mental disorder, however, this population is less likely to present with multiple fire-related vulnerability factors (Barnoux et al., 2015; Tyler et al., 2014).

At phase two of the model, participants were categorised as having an antisocial lifestyle outcome, despite previous research suggesting a proportion of incarcerated adult males who set fires had prosocial lifestyles (Barnoux et al., 2015). Reasons for this difference may be due to a higher prevalence of comorbid mental health issues, as well as barriers to community inclusion that provide stability reflective of a more prosocial lifestyle (e.g., lack of employment opportunities; Hendricks & Wehman, 2009). In addition to problematic intimacy, early adulthood for this population was characterised by alcohol/substance misuse, social exclusion, unstable accommodation, and an escalation of challenging and/or offending behaviour. Most participants reported experiencing social exclusion, characterised by a lack of meaningful relationships and engagement in meaningful activities, indicative of unequal social opportunities and suggestive of an environment that was too restrictive. Participants reported an escalation in offending and/or challenging behaviour prior to setting the fire, suggesting an opportunity for earlier intervention. Unequal social opportunities and restrictive environments may contribute to an escalation in offending and/or challenging behaviour in adults, irrespective of the presence of an interest in fire per se.

At phase three of the model, participants were triggered and motivated to set a fire by some similar factors reported by non-autistic adults/adults without intellectual disabilities (i.e., conflict, unmet needs, life stressors, and moral transgression, fire interest, self-harm/suicide, to cause change; Barnoux et al., 2015; Tyler et al., 2014). However, revenge and crime concealment, common motives for firesetting reported in the wider literature (e.g., Icové & Estep, 1987; Inciardi, 1970; Koson & Dvoskin, 1982; Pettway, 1987; Rix, 1994), were

markedly absent within the current sample. Participants did report experiencing a restriction on their human rights, characterised by a lack of control over their personal finances, food choices, and accommodation leading them to feel disempowered and setting a fire as way to regain control. Experiences relating to restriction on human rights and powerlessness are prevalent in the wider non-offending intellectual disability research (Connolly & Ward, 2008), but the link to challenging and/or offending behaviour has rarely been made. Participants were motivated by a desire to express emotions, rather than boredom, protection, crime concealment, economic gain, or to harm/kill a target (Barnoux et al., 2015; Tyler et al., 2014). More recent qualitative research provides further support for these findings (e.g., Holst et al., 2019) and may suggest this population are more likely than others to have difficulties in communication, emotional regulation difficulties, poor problem-solving skills and impulsivity, as described in the M-TTAF (Gannon et al., 2012). However, the M-TAFF does not account for all factors identified as important in the offence chains of adults with intellectual and other developmental disabilities. In addition, the unique and direct impact of peer influence in the planning phases of setting a fire for this population has not previously been identified and suggests a level of submission by less assertive or more suggestible peers into fire-related activities. Most participants showed a lack of understanding for the consequences of having started the fire (e.g., could not identify a victim, did not understand the dangers of the fire) and a general lack of empathy during the post offence period, unrelated to whether participants had completed offence related psychological treatment. However, no theory to date has incorporated or identified the contributory risk factors associated with cognitive and affective empathy for this population, despite cognitive empathy skills (e.g., perspective taking) being highlighted as a key deficit among autistic adults (e.g., Smith, 2009).

Limitations

However, the current research is limited as the sample size is small in part due to the circumstances of the COVID-19 pandemic, which prohibited further data collection and does pose problems to the generalisability of the findings. Nonetheless, the current sample represents 2.5% of all adults detained in hospitals under Part III of the Mental Health Act (1983, as amended in 2007) across England and Wales with a conviction for Arson ($n = 525$; Ministry of Justice, 2020) and is larger than the estimated prevalence rates of firesetting in

adults with intellectual disabilities within this population (0.4–1.4%; Devapriam et al., 2007; Ritchie & Huff, 1999). Further, while the current sample size is larger than some existing samples used to develop other grounded theory offence chain models in the field of offending behaviour (e.g., Courtney et al., 2006; Wakeling et al., 2007), the findings of the current article are not intended to generalise to all adults with intellectual and other developmental disabilities who set fires but to represent the offence chains of the current sample. A further weakness is potentially the recruitment of both autistic adults and adults with intellectual disabilities and treating the sample one as homogeneous group. Factors unique to these different populations may not have been identified because they were combined. However, both autism and intellectual disabilities come under the broader category of neurodevelopmental disabilities. Arguably, intellectual disabilities are the most common co-occurring disorder with autism, and a strong predictor of poor prognosis (Matson & Shoemaker, 2009). Due to a high prevalence of intellectual disabilities among autistic people (e.g., Matson et al., 1996; Wilkins & Matson, 2009), authors felt it was important to not exclude individuals from the current study. Nevertheless, further research should look to explore the similarities and differences between these populations. A core strength of grounded theory methodology is its ability for future modification in response to additional data and as a result the preliminary conclusions drawn from this study should be applied cautiously until replicated with larger samples and different populations (e.g., females, autistic adults without intellectual disabilities). A separate issue is that while excellent inter-rater reliability was established, the raters were not independent of the current study and were known to each other. However, the second rater was blind to the initial positioning of the meaning units.

Implications for policy and practice

Current research provides a useful theoretical grounding for future assessment and treatment practices. To our knowledge there is currently no accredited offender behaviour program specifically designed for adults with intellectual and other developmental disabilities who set fires, and some existing programs were developed before recent advancements in the field (Taylor et al., 2002, 2004, 2006). The Firesetting Intervention Program for Mentally Disordered Offenders (FIP-MO; Gannon & Lockerbie, 2014), has shown promising results (Tyler et al., 2018), but further validation is needed. The current study suggests individuals with intellectual

and other developmental disabilities may have different characteristics and offence specific treatment needs, which should be considered when offering interventions to this group. Future research would look to cross-validate the Firesetting Offence Chain for Adults with Intellectual and other Developmental Disabilities using a larger sample. A better understanding of the different pathways people may take through the model would provide a useful classification and highlight important differences between individuals, along with developing a better understanding of the treatment needs of this population.

Notes

1. Fire interest was defined as an elevated and/or deep-seated fascination with fire, fire paraphernalia and/or the consequences of fire.
2. Defined as repetitively thinking about the causes, situational factors, and consequences of one's negative emotional experience.

Data availability statement

Anonymised data is available on request.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Ethics approval

The study was approved by the Health Research Authority and Social Care Research Ethics Committee (IRAS 255255, REC ref: 19/IEC08/0019).

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