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Trauma Symptoms and Social Skills Deficits in Juvenile Firesetters

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Abstract

Archival data were analyzed to explore relationships among trauma symptoms (i.e., anger and anxiety), social skills deficits, and severity of firesetting among adolescent male firesetters in residential treatment. Standardized measures were used to assess levels of trauma symptoms (i.e., anger and anxiety) and social skills while an idiographic assessment was used to measure severity of firesetting behavior. Zero-order correlations and hierarchical regression analyses were conducted to test the hypotheses that (a) adolescents who report higher levels of trauma-related anger engage in more severe types of firesetting than those adolescents who report lower levels of trauma-related anger; (b) adolescents who report higher levels of trauma-related anxiety engage in more severe types of firesetting than those adolescents who report lower levels of trauma-related anxiety; (c) social skills mediate the relationship between trauma-related anger and juvenile firesetting; and (d) social skills mediate the relationship between trauma-related anxiety and juvenile firesetting. Hypotheses were not supported, which may have been due to participants reporting levels of trauma-related anger and anxiety that were not clinically elevated. Alternatively, the nonsignificant results may have been due to insufficient power to detect statistically significant differences. Suggestions for future research are provided.

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ABSTRACT

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Keywords: juvenile firesetting, trauma symptoms, social skills, adolescent firesetters

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INTRODUCTION

The perception of fire in many cultures is complicated: it is both revered and feared (Hardesty & Gayton, 2002;Yarnell, 1940). Our fascination with, and misapprehension about, fire typically begins early in life (Kolko & Kazdin, 1986) and follows a rather predictable pattern concurrent with normally occurring developmental stages (Suss, 1998). Many children first demonstrate an interest in fire between the ages of three and five years, and playing or experimenting with fire usually occurs between the ages of five to nine years (Showers & Pickrell, 1987). Up to one-third of all children engage in playing or experimenting with matches or fire, which is often viewed by adults as a passing phase (Raines & Foy, 1994). By the age of ten years, most children have learned the rules of fire safety and prevention (Showers & Pickrell), and fire play or experimentation ceases. However, for some children and adolescents, what began as experimentation or fire play can become intentional (i.e., the unsupervised or inappropriate and intentional use of an incendiary device to burn or set fire to an object; Wilder, 2007) or even severe firesetting (i.e., serious property damage with immediate risk of harm to self or others, or with harm or death, such as a house or bedroom fire, S. L. Henry, personal communication, September 2, 2008).

Although most juveniles (i.e., persons under the age of 18 years) who exhibit an interest in fire do not engage in firesetting behavior, a significant minority do. For

example, according to one national survey, approximately six percent of adolescents acknowledged they had set a fire recently (Chen, Arria, & Anthony, 2003). Just how many fires are set is unknown. Accurate data are difficult to obtain because fire personnel and law enforcement are never alerted to many of the fires that are set (Zipper & Wilcox, 2005). It is important to understand why juveniles (i.e., persons under the age of 18 years) engage in firesetting, particularly severe types, as the consequences of fire are extremely costly in terms of injury and loss of life as well as property damage and loss. According to the Federal Bureau of Investigation (FBI), more than half of arson arrests in the United States involve juveniles (Federal Bureau of Investigation, 2006). In 2002, juveniles set almost 14,000 fires, which resulted in 1,250 injuries, 210 deaths, and $339 million in property damage (Hall, 2005).

Rationale for the Study

It is highly unlikely that any one factor will be identified as responsible for juvenile firesetting behaviors as they appear to develop through multiple, complex pathways (Fineman, 1995). It is important to study those factors that appear to predispose some individuals to engage in juvenile firesetting behavior as understanding the role of these factors can inform the design and implementation of treatment and reduce risk of recidivism. In addition to external factors, a number of internal characteristics have been proposed to contribute to the development of juvenile firesetting behaviors. Two such characteristics that have not been adequately measured and examined are trauma symptoms, specifically anger and anxiety, and social skills deficits. As researchers have focused their study on children rather than adolescents (McCarty & McMahon, 2005;

Stickle & Blechman, 2002) and because almost two-thirds of juvenile arson arrests in 1997 involved adolescents aged 13 years and older (McCarty & McMahon), it is important to investigate the possible associations between trauma symptoms of anger and anxiety, social skills deficits, and adolescent firesetting behavior.

Similarly, very few researchers have examined characteristics of fires set by adolescents (e.g., severity of damage, setting, materials used). However, this type of information is important in assessing the severity of juvenile firesetting, and severity of firesetting is related to risk of recidivism (Kolko & Kazdin, 1994). In one study researchers interviewed juvenile firesetters aged 6 to 13 years in order to study details of firesetting incidents and identify potential predictors of recidivism, including severity of damages (Kolko & Kazdin). No similar study conducted with adolescent firesetters was found in extensive reviews of the published research literature.

<center>Purpose of the Study</center>

The purpose of the study will be to investigate the hypotheses that (a) adolescent firesetters who report high levels of trauma symptoms (specifically anger and anxiety) and high levels of social skills deficits engage in more severe firesetting behaviors than those adolescent firesetters who report low levels of trauma symptoms (specifically anger and anxiety) and low levels of social skills deficits and (b) social skills deficits mediate the relationship between level of trauma symptoms and severity of firesetting behavior. Some of the methodological problems in previous research will be addressed in this

study. Specifically, standardized measures will be used to assess level of trauma symptoms (specifically anger and anxiety) and social skills deficits.

In contrast, firesetting severity will not be assessed by a standardized measure. Rather, it will be evaluated using a severity rating scale that was developed specifically to measure characteristics of firesetting incidents committed by the present study's participants. Use of such an idiographic assessment is recommended by researchers who advocate linking practical assessment directly to treatment intervention in order to provide clinicians the most useful information (Barreto & Boekamp, 2005). Understanding the relationships among trauma symptoms such as anger and anxiety, social skills deficits, and severity of juvenile firesetting behaviors in adolescents will inform treatment development and implementation so that interventions can best meet individual needs.

REVIEW OF THE LITERATURE

Juvenile Firesetting

Historically, there has been a scarcity of research on juvenile firesetting. In the 1970s researchers reviewed the literature and found six articles specifically about juvenile firesetting and 17 related articles. Currently, the available literature is several times that number (Hardesty & Gayton, 2002). Within the past decade, juvenile firesetting has been recognized as a serious problem. This recognition may be in part a result of the significant growth in research examining risk factors for its development and maintenance as well as treatment outcomes (Root, MacKay, Henderson, Del Bove, & Warling, 2008). However, due to methodological limitations and a focus on children rather than adolescents, many of the research studies conducted to date are of limited utility for the purpose of developing and implementing treatment interventions to meet the special needs of adolescent juvenile firesetters. These treatment needs may include interventions to reduce symptoms of trauma and to enhance social skills. The trauma symptoms of anger and anxiety will be specifically examined because each of these emotions may negatively affect the development and utilization of social skills that could otherwise be a protective factor (Rak & Patterson, 1996).

The social learning theory developed by Kolko and Kazdin (1986) is the model most often used to describe the risk factors that predispose juveniles to engaging in

firesetting behaviors. In this model the researchers propose that risk factors can be categorized into three broad groups: (a) early learning experiences (e.g., early interest in fire, early direct and vicarious experiences with fire, adult modeling, peer pressure); (b) personal repertoire of cognitive and behavioral components (e.g., interpersonal skills deficits, covert antisocial behaviors, motivational factors such as revenge, limited awareness of fire and safety skills); and (c) parent and family influences and stressors (e.g., stressful external factors such as traumatic experiences and parental uninvolvement, limitations, and pathology, including child abuse or abandonment) (Glancy, Spiers, Pitt, & Dvoskin, 2003; Kolko & Kazdin). According to this model, juveniles are more likely to engage in firesetting, and more severe types of firesetting, as the number of risk factors they experience increases (Kolko & Kazdin).

Individuals can have a variety of reactions to the external factors they encounter (e.g., traumatic experiences) as well as a variety of motives for engaging in firesetting behavior (Fineman, 1995). In an attempt to better understand the role of various risk factors and motives in firesetting behavior, some theorists and researchers have developed classifications or typologies of juvenile firesetters so that the most appropriate treatment interventions for each individual can be developed (Brett, 2004). One such typology was developed by Fineman who proposed a classification system of seven types of juvenile firesetters, including the curiosity type, the accidental type, the cry for help type, the delinquent type, the severely disturbed type, the cognitively impaired type, and the sociocultural type. Under this classification system, juvenile firesetters who have high levels of trauma symptoms may be best classified as (a) "cry for help" firesetters who

have been abused or feel victimized and consciously or subconsciously use firesetting to bring attention to their plight (Slavkin, 2004) or (b) "severely disturbed" firesetters who have received diagnoses indicative of psychopathology, including Posttraumatic Stress Disorder.

Compared to the numerous empirical studies examining internal characteristics of juveniles who have set fires, there are far fewer studies of the characteristics of firesetting incidents. There is significant variability in aspects of individual fires such as severity of damage, settings, materials used, and whether others were present (Kennedy et al., 2006; Kolko & Kazdin, 1994). Some researchers have suggested that examination of these variations could help distinguish fireplay or relatively minor firesetting behaviors from more serious, severe types of firesetting. Such examination may also elucidate underlying motives for the fire (e.g., symptoms of trauma such as negative emotions from which the fire may provide some sense of relief; Glancy et al., 2003; Martin et al., 2004; Sharp et al., 2006).

Trauma Symptoms Among Juvenile Firesetters

Although there are a variety of pathways by which juveniles can develop trauma symptoms, sexual and physical abuse and neglect are among the most psychologically harmful as they are "immediate, proximate, injurious, and [often] of extended duration" (Ronen, 2002, p. 97). Adolescents who lack parental support and protection as a result of abuse or neglect have a higher risk of developing symptoms of trauma than those who have such parental support and protection. One risk factor for juvenile firesetting is parental absence, distance, or uninvolvement (Kolko & Kazdin, 1986; Slavkin, 2004).

The potential link between abuse and neglect and juvenile firesetting has been studied by a number of researchers dating back to Yarnell's (1940) seminal study (Root et al., 2008). Research results have been mixed. Some researchers have found that juveniles who have been abused or neglected are more likely to set fires, re-engage in firesetting after treatment, and report emotional and behavioral problems in general than juveniles without such an abuse history (Jayaprakash, Jung, & Panitch, 1984; Root et al.; Showers & Pickrell, 1987). However, several other researchers have found no evidence that abuse or neglect is associated with juvenile firesetting behavior (Ritvo, Shanok, & Lewis, 1983; Stewart & Culver, 1982) or is a predictor of firesetting recidivism (Kolko, Day, Bridge, & Kazdin, 2001).

Some researchers posit that it is not the experience of being abused or neglected per se that leads to firesetting behavior but suggest instead that the association between abuse and neglect and juvenile firesetting "operates largely through heightened emotional and behavioral difficulties" (Root et al., 2008, p. 172). In other words, it is possible that juveniles who have been abused or neglected and consequently experience symptoms of trauma are less able to regulate their emotions. This decreased ability to regulate emotion may increase one's vulnerability to engaging in acting-out behaviors such as firesetting when one experiences negative emotions. Two negative emotions commonly associated with traumatic experiences that may be especially difficult to regulate are anger and anxiety. According to Kolko and Kazdin's (1986) social learning model, juvenile firesetting is seen as an indication of both anger and anxiety (Moore, Thompson-Pope, & Whited, 1996).

Anger

As early as Yarnell's 1940 study, theorists and researchers alike have asserted that anger is an important element in understanding juvenile firesetting (Root et al., 2008). One theory that has been proposed to explain the relationship between anger (as a symptom of trauma) and firesetting is Lowenstein's (1989) expressive trauma theory. According to this theory, juvenile firesetting behavior is an indication of trauma symptoms and a vehicle for expressing anger and frustration about adverse life events and victimization or other life circumstances (Kolko, Kazdin, & Meyer, 1985; Putnam & Kirkpatrick, 2005). By setting fires, individuals attempt to express their feelings of anger without direct confrontation (Kolko, Kazdin et al.).

Results of research exploring the association between anger and juvenile firesetting have been relatively consistent even though researchers have used various methods to retrospectively and prospectively measure juveniles' anger. For example, in one study of children and adolescents who were referred to an assessment and intervention program for firesetting behavior, researchers interviewed the participants' caregivers to learn if the juveniles' firesetting had been motivated by anger (Root et al., 2008). These researchers found that the juveniles who had experienced abuse or neglect were more likely to endorse anger as the motive for their firesetting behavior than those without a history of abuse or neglect. Another group of researchers examined projective and other psychological test data for children and adolescents in a residential treatment center and found that those who had a history of firesetting were more likely to report

feelings of anger toward their father for abuse than those who had no history of firesetting behaviors (Sakheim, Vigdor, Gordon, & Helprin, 1985).

A few researchers have assessed juvenile firesetters' feelings of anger using standardized measures. For example, in a study of hospitalized children aged 5-13 years, Kolko, Kazdin, and their colleagues (1985) found that those who had a history of firesetting had significantly higher rates of externalizing behaviors as rated by their parents on the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983). However, although there is an externalizing aggressive behavior syndrome scale on the CBCL, it may not be an appropriate measure of anger. The constructs of anger and aggressive behavior are not equivalent (Feindler, 1990), and externalized aggressive behavior is not the sole manifestation of anger. In the same study, participants and their parents each completed the Interview for Aggression (IA; Kazdin, French, Unis, & Esveldt-Dawson, 1983), a semi-structured interview, and the Hostility-Guilt Inventory (HGI; Kazdin, French, Unis, & Esveldt-Dawson, 1983), a paper-and-pencil questionnaire, to rate participants' level of aggression. The HGI and IA may be more appropriate measures of anger than the CBCL as they include its multiple variations (e.g., indirect aggression, resentment, assaultiveness; Kolko, Kazdin et al.). Through analysis of these measures, the researchers found that children who had set a fire were perceived by their parents to have higher levels of aggression than children who had not engaged in firesetting behavior. In contrast, the participants' scores on these measures were not significantly different regardless of their group membership. The failure of the participants' scores to distinguish between firesetters and those without such a history is

consistent with other research indicating that children may tend to underestimate the severity and duration of their symptoms. Researchers have not conducted similar studies for adolescent populations using standardized measures such as the HGI or IA.

While numerous research studies conducted to date have focused on the potential association between anger and firesetting, at least one group of researchers has extended study to examine the potential link between feelings of anger and severe firesetting behavior. In a study of 50 juvenile firesetters in residential treatment, Sakheim and colleagues classified children and adolescents into two groups: those who engaged in "minor" or "severe" firesetting (Sakheim, Osborn, & Abrams, 1991). "Minor" firesetting was defined as playing with matches or setting a small fire accidentally. "Severe" firesetting was defined as activity that was deliberate or planned and resulted in significant injury or property damage. Using projective test data, the researchers found a number of internal characteristics distinguished the two groups. Those deemed to have engaged in "severe" firesetting were more likely than those in the "minor" firesetting group to experience conscious and unconscious "rage at insults or humiliations" and "intense anger at maternal rejection, neglect, or abandonment" (Sakheim, Osborn et al., p. 492).

In addition to anger, juveniles who have significant difficulty appropriately expressing other types of negative emotions, such as anxiety, may be more likely to engage in covert behaviors such as firesetting (Root et al., 2008).

Anxiety

Anxiety is one of the hallmark symptoms of a traumatic experience. The association between traumatic experiences such as abuse and neglect and disorders such as Posttraumatic Stress Disorder (PTSD) and other disorders on the anxiety spectrum has been well established (Briere & Rickards, 2007; Famularo, Fenton, Kinscherff, & Augustyn, 1996; Fergusson, Horwood, & Lynskey, 1996). As categorized in Fineman's typology (1995), those adolescents identified as "severely disturbed" firesetters are likely to have experienced parental neglect and dysfunctional relationships with their parents and to be diagnosed with a number of disorders on the anxiety spectrum such as PTSD and General Anxiety Disorder (GAD; Slavkin, 2004). Some researchers have demonstrated that a significant number of juvenile firesetters report symptoms of internalizing problems such as anxiety rather than feelings of anger (Barreto & Boekamp, 2005; Kolko & Kazdin, 1986). Other researchers have found that releasing feelings of anxiety is one of the motives cited for firesetting behaviors (Bumpass, Fagelman, & Brix, 1983; Zipper & Wilcox, 2005).

In a study of projective and other psychological test data for children and adolescents at a residential treatment facility, those who engaged in firesetting behaviors were found to have higher levels of anxiety and to have more difficulty tolerating their anxiety than those who had not set fires (Sakheim, Vigdor et al., 1999). The researchers found that for almost one-half of the youth in their study, firesetting behaviors could be "conceptualized as an overt destructive reaction to painful feelings of anxiety" (Sakheim,

Vigdor et al., p. 467), especially those feelings related to feeling abandoned or rejected by their parents.

In a study of adolescent males at a state psychiatric hospital, other researchers examined the Minnesota Multiphasic Personality Inventory-Adolescent (MMPI-A; Butcher, Williams, Graham, Archer, Tellegen, Ben-Porath et al., 1992) scores of male firesetters and found they had higher scores on several clinical scales, indicating internalizing symptoms of worry, fear, and tension (Moore et al., 1996), suggesting relatively high levels of anxiety. Although a number of researchers have examined the construct of anxiety as it relates to juvenile firesetting behavior, to date only one researcher - in a dissertation - has assessed levels of anxiety related to trauma using a standardized measure (Murphy, 2005). This research was conducted for children ages 6 to 13 years; no such research has been conducted for adolescent firesetters. In searches of the PSYCInfo, Medline, ERIC, Social Services Abstracts, and Sociological Abstracts databases and criminal justice periodicals, no citations were found for studies of anxiety related to trauma as a risk factor for severe types of firesetting behavior.

<div style="text-align:center">Social Skills Deficits</div>

In addition to resulting in symptoms of trauma such as anger and anxiety, the experience of abuse or neglect is a risk factor for a number of other difficulties, such as social skills deficits (Root et al., 2008). Regardless of when traumatic experiences occur, they have consequences for a child or adolescent's social development (Ronen, 2002). As children progress through developmental stages, they have different relational tasks to master. Thus, those who experience trauma as a result of abuse or neglect may have

issues related to trust, attachment, self-control, interpersonal relationships, and intimacy as they develop.

At least since the 1970s, some theorists and researchers have hypothesized that juvenile firesetting behavior is associated with social skills deficits and/or negative interpersonal relationships (Chen et al., 2003; McGrath, Marshall, & Prior, 1979; Showers & Pickrell, 1987; Vandersall & Wiener, 1970). According to Kolko and Kazdin's (1986) social learning theory, social skills deficits may be associated with a number of factors, including early learning experiences and parental and family influences and stressors. For example, in one study in which parent-child relationships were examined, parents of juvenile firesetters reported they had more dysfunctional interactions with their children and more unstable home environments than parents of youths without a history of firesetting (Kolko & Kazdin, 1991). The researchers suggested these familial stressors were associated with children's development of inadequate social skills and difficulty managing behavior and emotions (Gilman & Haden, 2006). Children who lack suitable role models may not develop appropriate assertiveness skills and may have difficulty directly expressing anger (Fineman, 1995). They may instead indirectly express their anger through covert actions such as firesetting.

A number of researchers have examined the association between social skills deficits and juvenile firesetting and have found inconsistent results (Kennedy et al., 2006). In several studies of juvenile firesetters, Kolko and colleagues used the CBCL (Achenbach & Edelbrock, 1983) to measure levels of social competence in children 13 years and younger. The "social competence" scale on the CBCL is comprised of three

subscales assessing participation in social activities and social interactions with others. In two of these studies, children who had a history of firesetting were found to have significantly lower levels of social competence than those without such a history (Kolko, Kazdin et al., 1985; Kolko & Kazdin, 1991). In a third study, however, no such difference was found (Kolko & Kazdin, 1992), perhaps because children who were in inpatient treatment (and thus likely to have high levels of externalizing behavior) were excluded from this study. Another potential explanation for the mixed findings is the reliance on parents' assessments of their children's social skills. When both the participants (aged 6-13 years) and their parents assessed children's use of socially skillful behaviors, as measured by the Matson Evaluation of Social Skills for Youngsters (MESSY; Matson, Rotatori, & Helsel, 1983), those children who had set fires were rated as having fewer social skills than those children without a history of firesetting (Kolko & Kazdin, 1991). To date, the CBCL and MESSY are the only standardized measures of social skills that have been used in studies of juvenile firesetters.

Several researchers have studied the potential link between social skills deficits and severe juvenile firesetting behaviors (Kennedy et al., 2006). For example, in a study of 180 child and adolescents in residential treatment, researchers examined projective and other psychological test data to assess social skills deficits (Sakheim & Osborn, 1999). The researchers found that those juveniles who engaged in "severe" firesetting behavior had weaker social skills (i.e., weaker social judgment and social anticipation) than those who engaged in "minor" firesetting or had set a fire accidentally.

Relationship between Trauma Symptoms and Social Skills Deficits

Anger and Social Skills Deficits

There is a strong theoretical relationship between anger and social skills deficits in which the effects are bidirectional (Feindler, 1990). A number of researchers have found that children who have been traumatized as a result of abuse or neglect often experience, and have difficulty regulating, negative emotions such as anger (Root et al., 2008). This emotional disregulation may impact their ability to develop and/or effectively use appropriate social skills. A vicious cycle can develop: a youth who perceives peer rejection may feel frustrated and angry, which increases the likelihood that he or she will use ineffective social skills and experience actual peer rejection (Kolko et al., 1985). Social skills training is one intervention often used to help adolescents learn to cope effectively with feelings of anger (Lochman, Barry, & Pardini, 2003).

Anxiety and Social Skills Deficits

Overall, the association between social skills deficits and anxiety is not as well-established as that of social skills deficits and anger. There is abundant empirical support for the link between social anxiety and social skills deficits (Elizabeth et al., 2006), and some researchers have found empirical support for child sexual abuse as a risk factor for a diagnosis of society anxiety or social phobia (Fergusson et al., 1996). Specifically, in a longitudinal study designed to determine the nature of the relationship between child sexual abuse and development of psychiatric disorders, researchers found that 7.8% of those who had experienced child sexual abuse also met criteria for a diagnosis of social phobia. Even if individuals do not meet criteria for a diagnosis of social anxiety, those

who feel insecure about their interpersonal relationships may also perceive they are being rejected by peers and feel anxious as a result. This anxiety may impair one's ability to utilize effective social skills (Kolko et al., 1985). The relationship between social skills deficits and anxiety as a symptom of trauma is not clear. Despite extensive searches through several venues (e.g., PSYCInfo, Medline, ERIC, Social Services Abstracts, Sociological Abstracts databases, and criminal justice periodicals) to the best of our knowledge, no studies have examined social skills deficits and anxiety in relation to traumatic experiences.

One group of researchers hypothesized that there is a relationship among aggressive behaviors, anxiety related to interpersonal relationships (defined as "shyness"), problems with social skills (defined as "peer rejection"), and juvenile firesetting behaviors. In a nationally representative sample of adolescents aged 12 to 17 years, 4,491 respondents completed self-report questionnaires about their problems and experiences, specifically feelings of aggressiveness, shyness or social withdrawal, rejection by peers, and firesetting behaviors occurring within the past six months (Chen et al., 2003). The researchers found that (a) adolescents who reported having set a recent fire were more likely to report feelings of aggressiveness and shyness than adolescents who did not engage firesetting, and (b) adolescents who reported having set a recent fire reported moderate to high levels of peer rejection. The group of adolescents most likely to report having set a recent fire were those who reported a combination of peer rejection, shyness, and aggressiveness (as measured by items such as enduring teasing, difficulty in getting along with other children, describing oneself as "shy," and fighting with peers).

Because this was a cross-sectional study, it was not possible to determine the sequence in which the participants' experiences and behaviors occurred. One possible limitation of this study is that the researchers equated the constructs of social anxiety and shyness, which view is not shared by some researchers who have argued that they are closely related but separate phenomena (Chavira & Stein, 2005). However, this study appears to provide some measure of empirical support for the association between social skills deficits and anxiety related to social or interpersonal issues.

<div align="center">Summary</div>

Juvenile firesetting has been a topic of interest for many years, but it is only within the past two decades that a significant number of researchers have examined the internal and external factors that may be associated with juvenile firesetting behavior. Internal characteristics such as symptoms of trauma, specifically the negative emotions of anger and anxiety, and social skills deficits have received some research attention, but the research has limitations. From a review of the literature, a number of tentative conclusions can be drawn. First, researchers have found mixed results for the potential link between abuse and neglect and juvenile firesetting. Second, there is ample research evidence that children and adolescents who have experienced abuse or neglect are at risk for developing symptoms of trauma, two of which are the negative emotions of anger and anxiety. Third, there is considerable empirical support for the association between anger and juvenile firesetting. Fourth, researchers have demonstrated that for some juvenile firesetters symptoms of anxiety are more salient than feelings of anger. Fifth, empirical studies examining the potential association between social skills deficits and juvenile

firesetting have yielded inconsistent results. Sixth, those few researchers who have studied severity of firesetting behaviors found that feelings of anger and social skills deficits distinguished juveniles who engaged in "severe" firesetting from those who engaged in "minor" firesetting. There have been no empirical studies of anxiety as a predictor of severe types of firesetting behavior.

One significant limitation of previous research on juvenile firesetting is the failure to use standardized assessment measures to assess those internal characteristics that may predispose individuals to engage in firesetting (Kolko & Kazdin, 1986), particularly for adolescents who engage in such behavior. A variety of methods have been used to measure symptoms of trauma such as parent and caregiver interviews (Kolko & Kazdin, 1992; Root et al., 2008), interviews of the youth (Kolko & Kazdin, 1992; Kolko & Kazdin, 1994; Kolko, Day et al., 2001), and self-report instruments that did not specifically measure emotional symptoms related to traumatic events (Martin, Bergen, Richardson, Roeger, & Allison, 2004). For example, in only one study has a standard assessment tool been used to measure trauma symptoms. The Trauma Symptom Checklist for Children – Alternate Version (TSCC-A) was used in a dissertation (Murphy, 2005) to measure trauma symptoms of children aged 6-13 years. The TSCC-A does not include the ten item Sexual Concerns subscale or one critical item relating to sexual issues. However, the test developer recommended that the full Trauma Symptoms Checklist for Children (TSCC) be used in clinical and forensic settings which serve children and adolescents who are likely to have experienced traumatic events of a sexual nature (Briere, 1996).

Social skills deficits are another internal characteristic that appears to be related to juvenile firesetting behavior in adolescents but has not been assessed using standardized measures. To date, participants in the only studies using standardized measures of social skills have been children age 13 years and under. The standardized measures used thus far are the parent forms of the Child Behavior Checklist (Kolko & Kazdin, 1992; Kolko, Day et al., 2001) and the MESSY (Matson et al., 1983). By using caregivers' reports of juveniles' social skills in the CBCL, the researchers assumed that adults are likely to have meaningful information about juveniles' social skills. However, adults may not have the most accurate information as juvenile peer culture is largely hidden (Youniss, 1981). Further, adult ratings of juvenile behaviors and symptoms have been shown to be more valid for identifying general difficulties than for identifying specific problems (McFadyen-Ketchum & Dodge, 1998). Using the MESSY (Matson et al.), researchers used both self-report and parents' reports to measure socially skillful behavior in children aged 6 to 13 years. However, self-reports of social skills other than the CBCL Youth Self Report have not been utilized with adolescent populations.

One goal of the current study was to address this limitation in previous studies by utilizing standardized measures for adolescents with a history of firesetting behavior. Another goal of the current study was to clarify the associations among trauma symptoms, social skills deficits, and severe types of firesetting behavior in adolescents in order to inform intervention development.

Hypotheses of the Study

The present study examined the following hypotheses:

1. Adolescents who report higher levels of anger, as it relates to trauma, engage in more severe types of firesetting behavior than those adolescents who have lower levels of anger.

2. Adolescents who report higher levels of anxiety, as it relates to trauma, engage in more severe types of firesetting behavior than those adolescents who have lower levels of anxiety.

3. Social skills mediate the relationship between anger and juvenile firesetting behavior.

4. Social skills mediate the relationship between anxiety and juvenile firesetting behavior.

METHODS

Procedures

Archival data from a residential treatment facility for males aged 10 to 18 years in a mid-size West Coast city were used to examine the hypothesized relations among trauma symptoms, social skills deficits, and juvenile firesetting behaviors. The source of the data was a database of information collected in the evaluation process of each resident upon his entrance to the residential treatment facility.

Participants

Participants in this study were 42 males between the ages of 11 and 16 years who entered a West Coast residential treatment facility and had a history of firesetting behavior. With regard to ethnicity, a total of 33 (78.6%) participants identified themselves as white or Caucasian, three (7.1%) identified themselves as Hispanic or Latino, two (4.8%) identified themselves as African American, two (4.8%) identified as Native American, and two (4.8%) identified as biracial.

Measures

The firesetting evaluations were conducted by the clinical director, a licensed clinical psychologist, or clinical psychology graduate students trained in the evaluation of firesetting behavior. In addition to the firesetting evaluation, participants were given two measures to complete: the Trauma Symptom Checklist for Children (TSCC; Briere, 1996) and the Social Skills Rating System (SSRS; Gresham & Elliott, 1990).

Trauma Symptom Checklist for Children (TSCC)

The TSCC is a widely-used measure of broad trauma symptoms in children aged 8 to 16 years. It is designed to assess children who have experienced a number of traumatic events, including abuse, witnessing violence, and significant loss. The TSCC is a self-report, paper and pencil instrument. Its 54 items are scored on a 4-point Likert scale on which respondents are asked to rate how often something (i.e., a thought, feeling, or behavior) occurs: 0 (*never*), 1 (*sometimes*), 2 (*lots of times*), or 3 (*almost all of the time*). There are no reverse scored items. The TSCC has two validity scales (i.e., Under-Response and Hyper-Response) and six clinical scales: Anger, Anxiety, Depression, Dissociation, Posttraumatic Stress, and Sexual Concerns. The nine items on the Anger scale measure a respondent's angry thoughts, feelings, and behaviors (e.g., "arguing too much"). There are nine items on the Anxiety scale, which is used to measure a respondent's level of anxiety, worry, and hyperarousal (e.g., "feeling afraid something bad might happen"). Depressive symptoms are measured on the Depression scale, which has nine items (e.g., "feeling sad or unhappy"). The Posttraumatic Stress scale, consisting of ten items, assesses the three customary constellations of posttraumatic stress symptoms: arousal, avoidance, and re-experiencing (e.g., "bad dreams or nightmares"). The Dissociation scale has ten items and measures dissociative symptoms (e.g., "feeling like things aren't real"). The ten items in the Sexual Concerns scale measure thoughts, feelings, and behaviors of a sexual nature that are concerning to the respondent (e.g., "getting upset when people talk about sex").

TSCC scores may range from 0 to 162. They are converted into *T* scores for purposes of interpreting a respondent's level of symptomatology. *T* scores of 65 or above on the Anger and Anxiety clinical scales are considered clinically significant (Briere, 1996).

The normative sample of 3,008 children was comprised of three separate nonclinical samples from Midwestern states. The sample was stratified for age and ethnicity. The six clinical scales have good internal consistency (α = .77 to .89; Briere, 1996). The two validity scales (i.e., Hyper-Response and Under-Response) have adequate internal consistency (.66 and .85 respectively). No information as to test-retest reliability was available. Convergent validity was demonstrated by the TSCC's moderate correlations with similar measures (e.g., Child Behavior Checklist and the Revised Children's Manifest Anxiety Scale). However, results of factor analyses and other information to support construct validity was not available in the manual (Boyle, 2003).

Social Skills Rating System (SRSS)

The SRSS was used to determine participants' level of broad social skills. Staff members of the treatment facility where participants were in residential treatment rated participants' social skills in four domains (i.e., assertion, cooperation, responsibility, and self-control) using the parent form of the SSRS. This form has 55 items and is a self-report, paper and pencil instrument. Participants rate how often behaviors occur on a 3-point Likert scale, ranging from *never* to *very often*. They also rate how important these

behaviors are on a 3-point Likert scale that ranges from 0 (*not important*) to 2 (*critical*).

There are no reverse scored items. The range of raw scores is 0 to 110, and raw scores are

converted into Standard Scores with a mean of 100 and a standard deviation of 15. High

scores indicate that target adolescents use social skills more often than what was average

for same-aged peers in the normative sample. Similarly, low scores indicate that target

adolescents use social skills less often than what was average for same-aged peers in the

normative sample.

Internal consistency for the total score of the parent form of the SRSS was

deemed to be high ($\alpha = .90$; Gresham & Elliott, 1990). Test-retest reliability data were not

provided for the parent form. Although this form also has four subscales, the total score

was used for analysis in the present study as the four subscales are not reliable enough for

independent analysis (Furlong & Karno, 1995). Construct validity was supported by

factor analyses with the normative sample. The SRSS correlated highly with a number of

similar measures (e.g., Child Behavior Checklist, Achenbach & Edelbrock, 1983; Social

Behavior Assessment, Stephens, 1979), demonstrating convergent validity (Benes, 1995).

The normative sample of 4,170 children included male and female students of

each grade level in regular education, self-contained special education, and mainstream

special education settings in the Northeast, North Central, Southern, and Western United

States. Hispanic children were underrepresented, possibly due to the fact that no children

from West Coast states were included in the normative sample.

Fire Incident Rating Scale (FIRS)

This instrument was developed specifically for those residents of the West Coast treatment facility who have a history of firesetting behavior. The FIRS is used to assess the severity of past firesetting incidents, which information is used to determine risk of repeated firesetting and need for intensive firesetting treatment. Information is gathered through a structured clinical interview of the treatment facility's clients by a licensed clinical psychologist or clinical psychology graduate students who have been trained in the assessment process. Each instance of firesetting behavior reported by an adolescent client of the treatment facility is rated on a scale of 1 ("repeated play in spite of being told 'no' where property is not damaged and people are not harmed; includes candle play with candles, lighting matches in ashtray or other safe place") to 5 ("serious property damage with immediate risk of harm to self or others, or with harm or death; house fire, occupied or unoccupied, bedroom fire while in it). The highest score for any one fire that participant received on the FIRS was used as the outcome variable for the current study.

No information as to the FIRS' reliability or validity was available. Its items were developed based on empirical studies of juvenile firesetting in the research literature (S. L. Henry, personal communication, September 2, 2008).

RESULTS

Data analyses

We conducted a series of zero-order correlations to determine if, as hypothesized, adolescents who reported higher levels of trauma-related anger and anxiety engaged in more severe firesetting than adolescents who reported lower levels of trauma-related anger and anxiety. We also conducted multiple regression analyses to determine if, as hypothesized, social skills mediated the relationship among trauma symptoms of anger and anxiety and severity of firesetting behavior. We considered trauma symptoms of anger and anxiety separately during the analyses.

Anger

Descriptive Statistics

The Trauma Symptom Checklist for Children (TSCC) was used to measure trauma-related symptoms of anger. Participants obtained mean scores in the average range for anger (M = 48.60, SD = 12.20). They also obtained mean scores in the average range for the TSCC's two validity scales (Under-Response, M = 53.24, SD = 16.45, and Hyper-Response, M = 50.62, SD = 15.60). The Social Skills Rating System (SSRS) was used to assess participants' social skills as rated by residential treatment program staff. Participants obtained mean scores in the low average range (M = 81.62, SD = 12.61); that is, their social skills were rated as being slightly lower than average compared to their peers. The Fire Incident Rating Scale (FIRS) was used to assess the severity of

participants' firesetting. Participants obtained a mean score of 3.71 ($\underline{SD}$ = 1.24) on a scale of 1 to 5, with 5 representing the most severe fire. Means, standard deviations, and intercorrelations among the variables are listed in Table 1.

Mediator model

To conclude that a mediational model exists Baron and Kenney (1986) posit the following criteria should be fulfilled: (a) variations in trauma symptoms of anger significantly account for variations in firesetting severity; (b) variations in trauma symptoms of anger significantly account for variations in social skills; (c) variations in social skills significantly account for variations in firesetting severity (see paths a, b, and c of Figure 1, respectively); and (d) the relation between trauma symptoms of anger and firesetting severity should decrease or disappear when the contribution of social skills is controlled. In other words, for a mediation model to exist, social skills need to be a significant predictor of change (i.e., the beta associated with social skills must be significant) in firesetting severity over and above the effects of trauma symptoms of anger. Further, the beta associated with trauma symptoms of anger must decrease or become nonsignificant, after controlling for social skills. We considered trauma symptoms of anger and anxiety separately during the analyses.

We first conducted a zero-order correlation to assess whether variations in trauma symptoms of anger ($\underline{A}$) significantly accounted for variations in firesetting severity ($\underline{FS}$), as depicted in Equation 1(A).

$$\text{\ss}_{FS} = \text{\ss}_O + \text{\ss}_A \text{ (path a)}. \hspace{4cm} 1(A)$$

This correlation was not significant ($r = -.135$), which result may be related to participants obtaining a mean score in the average range for trauma-related symptoms of anger. Thus, the hypothesis that adolescents who report higher levels of trauma-related anger engage in more severe firesetting than adolescents who report lower levels of trauma-related anger was not supported.

We then conducted a zero-order correlation to assess the relation between trauma symptoms of anger (A) and social skills (SS), as depicted in Equation 2(A).

$$\text{ß}_{SS} = \text{ß}_{O} + \text{ß}_{A} \text{ (path b).} \qquad\qquad 2(A)$$

This correlation was not significant ($r = .154$). This nonsignificant result may be related to participants obtaining a mean score in the average range for trauma-related anger and a mean score in the low average range for social skills.

Next we conducted a zero-order correlation to assess the relation between social skills (SS) and firesetting severity (FS), as depicted in Equation 3(A).

$$\text{ß}_{FS} = \text{ß}_{O} + \text{ß}_{SS} \text{ (path c).} \qquad\qquad 3(A)$$

This correlation was not significant ($r = -.178$). This nonsignificant result may be related to participants obtaining a mean score in the low average range for social skills.

Finally, we conducted a multiple regression analysis to determine if, as hypothesized, social skills mediated the relationship between trauma symptoms of anger and firesetting severity. We did not find a statistically significant beta ($\text{ß} = -.247$, $p = .130$) associated with social skills as a mediator for firesetting severity and trauma symptoms of anger (step 2 of Table 2).

Anxiety

Descriptive statistics

The Trauma Symptom Checklist for Children (TSCC) was used to measure

trauma-related symptoms of anxiety. Participants obtained mean scores in the average

range for anxiety ($\underline{M}$ = 47.52, $\underline{SD}$ = 14.20). They also obtained mean scores in the

average range for the TSCC's two validity scales (Under-Response, $\underline{M}$ = 53.24, $\underline{SD}$ =

16.45, and Hyper-Response, $\underline{M}$ = 50.62, $\underline{SD}$ = 15.60). The Social Skills Rating System

(SSRS) was used to assess participants' social skills as rated by residential treatment

program staff. Participants obtained mean scores in the low average range ($\underline{M}$ = 81.62,

$\underline{SD}$ = 12.61); that is, their social skills were rated as being slightly lower than average

compared to their peers. The Fire Incident Rating Scale (FIRS) was used to assess the

severity of participants' firesetting. Participants obtained a mean score of 3.71 ($\underline{SD}$ =

1.24) on a scale of 1 to 5, with 5 representing the most severe fire. Means, standard

deviations, and intercorrelations among the variables are listed in Table 1.

Mediator model

To conclude that a mediational model exists Baron and Kenney (1986) posit the

following criteria should be fulfilled: (a) variations in trauma symptoms of anxiety

significantly account for variations in firesetting severity; (b) variations in trauma

symptoms of anxiety significantly account for variations in social skills; (c) variations in

social skills significantly account for variations in firesetting severity (see paths a, b, and

c of Figure 1, respectively); and (d) the relation between trauma symptoms of anxiety and

firesetting severity should decrease or disappear when the contribution of social skills is

controlled. In other words, for a mediation model to exist, social skills need to be a significant predictor of change (i.e., the beta associated with social skills must be significant) in firesetting severity over and above the effects of trauma symptoms of anxiety. Further, the beta associated with trauma symptoms of anxiety must decrease or become nonsignificant, after controlling for social skills. We considered trauma symptoms of anger and anxiety separately during the analyses.

We first conducted a zero-order correlation to assess whether variations in trauma symptoms of anxiety (Ax) significantly accounted for variations in firesetting severity (FS), as depicted in Equation 1(Ax).

$$\text{ß}_{FS} = \text{ß}_O + \text{ß}_{Ax}\text{ (path a).} \hspace{4cm} 1(Ax)$$

This correlation was not significant ($r = -.051$), which result may be related to participants obtaining a mean score in the average range for trauma-related symptoms of anxiety. Thus, the hypothesis that adolescents who report higher levels of trauma-related anxiety engage in more severe firesetting than adolescents who report lower levels of trauma-related anxiety was not supported.

We then conducted a zero-order correlation to assess the relation between trauma symptoms of anxiety (Ax) and social skills (SS), as depicted in Equation 2(Ax).

$$\text{ß}_{SS} = \text{ß}_O + \text{ß}_{Ax}\text{ (path b).} \hspace{4cm} 2(Ax)$$

This correlation was not significant ($r = .100$). This nonsignificant result may be related to participants obtaining a mean score in the average range for trauma-related anxiety and a mean score in the low average range for social skills.

Next we conducted a zero-order correlation to assess the relation between social skills (SS) and firesetting severity (FS), as depicted in Equation 3(Ax).

$$\beta_{FS} = \beta_O + \beta_{SS} \text{ (path c).} \qquad\qquad 3(Ax)$$

This correlation was not significant ($r = -.178$). This nonsignificant result may be related to participants obtaining a mean score in the low average range for social skills.

Finally, we conducted a multiple regression analysis to determine if, as hypothesized, social skills mediated the relationship between trauma symptoms of anxiety and firesetting severity. We did not find a statistically significant beta ($\beta = -.259$, $p = .112$) associated with social skills as a mediator for firesetting severity and trauma symptoms of anxiety (step 2 of Table 3).

Figure 1

Mediational Model
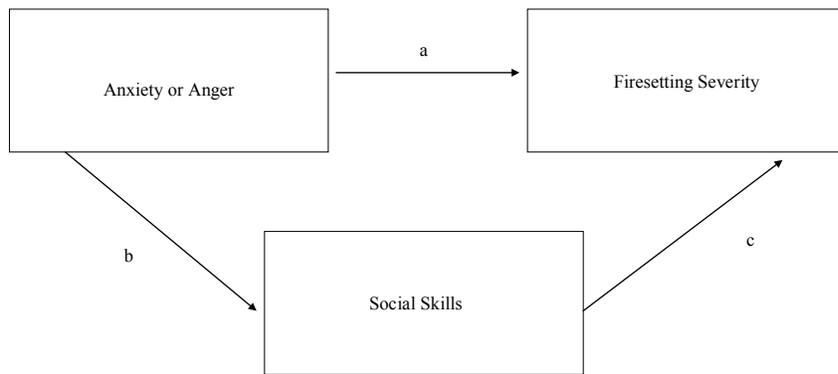
Table 1

Zero-order Correlations for Firesetting Severity and Predictor Variables Trauma

Symptoms and Social Skills

Variable	M	SD	1	2	3
Firesetting Severity	3.71	1.24	-.051	-.135	-.178
Predictor Variables					
1. Trauma Symptoms: Anxiety	47.52	14.20	--	.804*	.100
2. Trauma Symptoms: Anger	48.60	12.20		--	.154
3. Social Skills	81.62	12.61			--

Note. *p < .01.

Table 2

Regressions of Firesetting Severity onto Trauma Symptoms of Anger and Social Skills

Predictor	B	SE	ß	t	p	ΔR^2 due to contribution of last factor in each set
Step 1						
Constant	4.459	.807		5.527	.000	
Anger	-.015	.016	-.150	-.937	.355	.023
Step 2						
Constant	6.386	1.475		4.331	.000	
Anger	-.012	.016	-.116	-.728	.471	
Social skills	-.026	.017	-.247	-1.550	.130	.060

Table 3

<u>Regressions of Firesetting Severity onto Trauma Symptoms of Anxiety and Social Skills</u>

Predictor	<u>B</u>	<u>SE</u>	ß	<u>t</u>	<u>p</u>	ΔR^2 due to contribution of last factor in each set
Step 1						
Constant	3.966	.684		5.799	.000	
Anxiety	-.005	.014	-.59	-.367	.715	.004
Step 2						
Constant	6.077	1.458		4.168	.000	
Anxiety	-.003	.013	-.036	-.227	.822	
Social skills	-.027	.017	-.259	-1.630	.112	2.657

DISCUSSION

Juvenile firesetting is a significant problem in the United States and has serious implications for public safety. Because the consequences of fire are extremely costly in terms of injury and loss of life as well as property damage and loss, it is important to study those factors that appear to predispose some adolescents to engage in severe juvenile firesetting behavior. Factors that have been identified by researchers as being associated with juvenile firesetting, specifically anger and anxiety (as they relate to trauma) and social skills deficits, were investigated to assess their relationship to severe juvenile firesetting behavior.

In this study participants obtained mean scores in the average range for both trauma-related anger and anxiety, thus suggesting they were not experiencing levels of anger or anxiety in the clinical range at the time they were evaluated (i.e., upon entrance to the residential treatment facility). Their obtained scores on the Trauma Symptom Checklist for Children (TSCC) validity subscales (i.e., Under-Response and Hyper-Response) were also in the average range, suggesting participants were not underreporting or overreporting their symptoms. Further, participants' social skills were rated as being in the low average range, only slightly lower than those of their peers, suggesting that at least in the highly-controlled environment of residential treatment,

participants were able to utilize some social skills. These unanticipated results may indicate the relationships among traumatic experiences, firesetting, and social skills are more complex than had been hypothesized.

Hypotheses that trauma symptoms of anxiety and anger are associated with juvenile firesetting severity and that social skills mediate the relationship between these trauma symptoms and firesetting severity were not supported. However, these statistically nonsignificant results should not be interpreted to conclude definitively that trauma symptoms of anxiety and anger and social skills are unrelated to severity of juvenile firesetting behavior. Rather, it is possible these results were not statistically significant due to participants' symptoms of trauma-related anger or anxiety being in the average range or their social skills in the low average range. It is also possible that insignificant results occurred due to inadequate power to detect significant differences. In this study, we used archival data with a sample size of 42. It is recommended that these variables be studied in future research with populations of sufficient size to allow the detection of significant differences.

In this study archival data were utilized for several reasons. First, using de-identified archival data collected by individuals other than principal investigators helps to ensure the privacy and confidentiality of participants who are members of a protected population, which is of utmost importance for minors involved with child welfare or juvenile justice systems. Second, this method of data collection prevents potential confounding factors such as experimenter bias. Third, the use of archival data ensures participants will not be placed at risk for psychological distress - for purposes of research

- by being asked to reflect on their thoughts, feelings, and behaviors related to traumatic experiences. Although the use of archival data can be beneficial for participants, there are inherent limitations in its utility for research purposes. For example, it was not possible to determine the accuracy with which data had been entered into the data file, and missing data could not be recovered. In the future researchers could mitigate some of these limitations by ensuring data in the computerized data file are carefully proofread against original data sources. Further, it may be useful if appropriately trained individuals unaffiliated with the principal investigators review charts to recover missing data where possible.

Another feature inherent in the use of archival data relates to the selection of measures to be administered. Because researchers who use archival data do not predetermine methods of data collection or which measures will be used for a particular study, they may be required to use information that is less than ideal for their study. In the present study, there were several benefits associated with the use of the TSCC. The TSCC is a widely-used standardized measure with good reliability and convergent and discriminant validity (Briere, 1996). Benefits of using standardized measures in research include the ease with which research can be replicated and the ability for researchers to compare results across studies. To the best of our knowledge, only one researcher to date has used a standardized measure to determine the extent of children's trauma symptoms as they relate to juvenile firesetting behavior (Murphy, 2005).

However, use of the TSCC alone may not have been the ideal method of obtaining information about participants' trauma symptoms for purposes of this study.

The TSCC relies on participants' willingness and ability to attend to the task, capacity and willingness to reflect on their experiences, thoughts, and feelings about traumatic events, and willingness to provide accurate responses (Murphy, 2005). However, the content of the TSCC items appears to be distressing for some respondents (Murphy), which we also observed during administration of the TSCC to adolescents attending the same treatment facility as the participants in this study. In future research, in addition to using a paper-and-pencil measure such as the TSCC to assess trauma symptoms, a more complete understanding of participants' experiences may be obtained through a supplemental clinical interview or corroborating information from caregivers (Kolko & Kazdin, 1992; Root et al., 2008) or projective techniques (Murphy).

The negative correlations between trauma symptoms of anxiety and anger and firesetting severity obtained in this study were not consistent with the hypothesized direction of correlation and may seem counterintuitive. Although we cannot account for these results, we may speculate that because participants' trauma symptoms of anxiety and anger were measured some time after they engaged in firesetting behavior, we may not yet adequately understand the function of their firesetting behavior. Alternatively, the mechanism by which their levels of anger and anxiety are associated with the severity of the fires they set may be more complicated than we had hypothesized. For example, the act of setting fires may reduce levels of anxiety and anger for those adolescents who have experienced traumatic events and subsequently developed related symptoms of anxiety and anger (Bumpass et al., 1983; Fineman, 1995; Zipper & Wilcox, 2005). These are

questions that need to be explored further in future research (e.g., assessment at multiple time points, longitudinal studies of recidivism).

The Social Skills Rating System (SSRS), used to assess participants' social skills, is a widely-used standardized measure with good reliability and convergent validity (Gresham & Elliott, 1990). To address potential problems associated with adolescents' self-reports (Kolko, Kazdin et al., 1985) and parent reports of their children's social skills (Youniss, 1981), participants' social skills were rated upon their entrance into residential treatment by the facility's staff members. Staff members at the treatment facility are highly trained and experienced in working with children and adolescents who manifest highly problematic internalizing and externalizing behaviors that severely impair their functioning. However, staff members observed and rated participants' use of social skills in a highly-structured and controlled environment in which residents are required to use at least a modicum of social skills to avoid being sanctioned (e.g., lose points in token economy system). Observations and ratings in this context may have contributed to participants' obtaining a mean in the low average range for social skills. In other words, participants' social skills deficits may not have been as readily apparent in this type of highly-controlled environment as they might be in a less restrictive setting. Further, comparison of participants' scores in the present study to the normative sample's scores may not be appropriate as individuals in the normative sample were not in residential treatment and parents, rather than treatment milieu staff, rated their children's social skills. In the future, it may be preferable to use multiple raters (e.g., the adolescents and their parents, teachers, and treatment milieu staff members) to gain a more complete

understanding of adolescents' social skills from several perspectives in a variety of contexts.

In addition, it may be beneficial to investigate whether expressive language problems are related to appropriate expression of negative emotions, as hypothesized with regard to juvenile firesetters (Murphy, 2005). One researcher found children who had set fires were more likely to receive diagnoses of learning disorders, including expressive language and mixed receptive/expressive language disorders (Murphy). For example, a test of expressive language abilities (e.g., subtests of Wechsler Individual Achievement Test or Woodcock-Johnson III Tests of Achievement) could enhance the field's understanding of appropriate expression of negative emotion as it relates to adolescents' firesetting. It is possible these adolescents possess adequate social skills but are unable to utilize their skills due to problems expressing themselves effectively in interpersonal interactions.

Unlike the TSCC and SSRS, the FIRS is not a standardized measure but was developed specifically to measure characteristics of firesetting incidents reported by this study's participants and their fellow residents at a West Coast treatment facility. Researchers' use of idiographic assessments may facilitate the development of treatment interventions for specific populations' individualized needs (Barreto & Boekamp, 2005). The FIRS represents an improvement of the method by which some previous researchers have measured juvenile firesetting behavior. For example, some researchers have used one item from the Child Behavior Checklist (CBCL) to ascertain whether someone has a history of firesetting (Kolko & Kazdin, 1991; Kolko & Kazdin, 1992). However, the use

of this one item allows for little variability in responses (i.e., it is *not true* the adolescent

sets fires, it is *somewhat or sometimes true* the adolescent sets fires, or it is *very true or

often true* the adolescent sets fires). In contrast, the FIRS offers a wider variability of

response options: its scores relating to the severity of each fire set by an individual range

from 1 to 5. However, because this range of possible responses is still small enough to

result in a falsely small correlation, in the future researchers might consider how to

further increase the FIRS' variability.

Another benefit of the FIRS is its inclusion of questions about characteristics of

fires set and the contexts in which they were set, an area of study that has received

relatively little research attention to date. However, potentially confounding factors with

regard to the severity of fires should be noted. For example, individuals may intend to set

serious fires (i.e., resulting in property damage or loss), but third parties may discover the

fires and intervene in a timely manner, thus preventing them from becoming serious.

Alternatively, individuals may not intend to set serious fires, but environmental

circumstances (e.g., gusts of wind) might cause fires to grow beyond the size intended.

Attempts to distinguish firesetters' intentions from actual events may prove fruitful for

future researchers. Similarly, reliance on adolescents' reports of their firesetting behavior

as the single source of information may not be the most valid measure of such behavior

(Kolko & Kazdin, 1994) as adolescent reporters may underestimate the severity or

duration of their behavior (Kolko et al., 1985). It would helpful if adolescents' reports of

their firesetting could be corroborated by other sources (e.g., parents, law enforcement, or

firefighters) in order to increase the validity of such reports.

The primary goal of this study was to investigate possible associations between trauma symptoms of anxiety and anger, social skills deficits, and adolescent firesetting behavior. Although analysis of the data did not result in statistically significant results, it does not necessarily follow that the hypothesized relationships do not exist. It is possible that participants' levels of trauma-related anger and anxiety at the time they entered the treatment facility and completed the TSCC were quite different than when they engaged in firesetting behavior. Further, participants' reports of firesetting incidents may not have been accurate, and actual firesetting events may have varied greatly from their intentions. Alternatively, the relationships among trauma-related anger or anxiety, social skills, and firesetting severity may be more complex than hypothesized. Finally, this study's sample size provided insufficient power to detect significant differences. Because the consequences of juvenile firesetting behavior can be devastating and permanent for individuals setting fires and for the larger community, factors theorized to predispose adolescents to set fires should continue to be studied.

Future Directions

Results of this study have implications for future research on juvenile firesetting behavior among adolescents. For example, in future studies it would likely be informative if adolescent firesetters' levels of trauma symptoms (i.e., anger and anxiety) and social skills were examined at multiple time points. A prospective, longitudinal study would be ideal. Further, it would be helpful if multiple raters and methods of assessment were employed to measure these variables as information gleaned through use of a variety of approaches can provide valuable insights from multiple perspectives. This multiple data

collection method may result in a better understanding of the temporal sequence of development of trauma-related anger and anxiety, social skills deficits, and firesetting behavior. A better understanding of these phenomena may lead to improvements in design and implementation of effective and efficient targeted interventions for adolescents with a history of firesetting..

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APPENDIX

Trauma Symptom Checklist for Children (TSCC)

The complete measure "Trauma Symptom Checklist for Children" has been redacted from the online version of this work to preserve the validity and security of the instrument.

APPENDIX

Social Skills Rating System (SSRS)

The complete measure "Social Skills Rating System" has been redacted from the online version of this work to preserve the validity and security of the instrument.

APPENDIX

Fire Incident Rating Scale (FIRS)

The complete measure "Fire Incident Rating Scale" has been redacted from the online version of this work to preserve the validity and security of the instrument.