

Criminal thinking and psychosocial characteristics among young adults entering residential substance use treatment

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Abstract

Background and aim: Young adults with substance use (SU) problems face a high risk of co-occurring problems, including criminality. The aim of the present study was to assess the psychosocial characteristics, SU problems, and criminal thinking young adults entering SU treatment have, and whether the SU characteristics, sex and age are associated with criminal thinking scores.

Methods: The sample was 407 young adults aged 16–29 years who underwent an entry assessment between January 2011 and December 2016 at a residential SU treatment institution in Norway. All study data were extracted from electronic health records, including survey information from the Achenbach System of Empirically Based Assessment and the Psychological Inventory of Criminal Thinking Styles. **Results:** In the present sample, severe SU, high rates of psychosocial problems, and criminal thinking were reported. Almost three-quarters (72.67%) of young adults reported high levels of criminal thinking (≥ 60). However, male participants were more likely to report high levels of criminal thinking compared to female participants ($p=0.031$). In bivariate regression models, only sex and having stimulants/opioids as primary drug were associated with mean levels of criminal thinking. The same was true in the multiple regression model.

Conclusion: Young adults in residential SU treatment are a multi-problem high-risk/high-need group of people. Due to the elevated levels of criminal thinking, we recommend that young adults in SU treatment should be screened for criminogenic treatment needs, such as criminal thinking, regardless of justice involvement.

Keywords

criminal thinking, mental health problems, residential treatment, substance use, SUD, young adults

Criminal behaviour is commonly reported among young adults with substance use (SU) problems (Brunelle et al., 2014; Smith & Saldana, 2013; Weber & Lynch, 2021). This co-morbidity can have a significant effect on the SU recovery process, making it even more difficult and complex (Brunelle et al., 2013, 2014). Some studies have examined to what extent criminal thinking (CT) can shed light on the SU-crime relationship (Walters, 2014a, 2015a, 2015b). Research, however, has mostly been carried out among adult correctional populations. Although there is empirical evidence that CT is related to SU and criminality among non-correctional populations (Carr et al., 2009; McCoy et al., 2006; Mitchell et al., 2017), few previous studies have applied CT concepts to young adult SU treatment settings.

Accumulation of adversity matters, implying that most risk domains play a more or less

significant role in the development of maladaptive behaviour, such as SU and crime (Assink et al., 2015; Hecksher & Hesse, 2009; Weber & Lynch, 2021). For instance, SU often involves joining in social networks with other people using substances (Sieving et al., 2000), increasing the negative influence on SU behaviours, including criminal activity (Hser et al., 2001; Walters, 2016) and devoting less time to work and/or school-related activities (Tucker et al., 2006). Residential SU treatment is seen as an appropriate intervention for individuals who have not responded to less restrictive treatments (Winters et al., 2014). Thus, individuals in residential settings often present with greater clinical complexity and more severe SU problems compared with those in outpatient settings (Braatveit et al., 2018; Comandule et al., 2019; Grella et al., 2001). Lifetime exposure to trauma (Shin et al., 2018), emotional dysregulation, low self-knowledge,

social knowledge, and interpersonal skills (Parolin et al., 2017) are commonly presented among young adults entering residential SU treatment.

Criminal thinking

Measurement and conceptualisation of CT came from the need to assess all individuals involved in the criminal justice system, specifically those involved in SU treatment (De Leon, 2000; Garner et al., 2007; Knight et al., 2006). The work derived from the assumption that all criminals share similar traits that make criminal behaviours more likely, but nevertheless can be treated and rehabilitated (Best et al., 2009; Garner et al., 2007; Knight et al., 2006). The constructs of CT developed out of a foundation of cognitive theory, a theory proposing that thoughts dictate behaviours, and that specific, individual patterns of thought will predict behaviours (Beck, 1979). CT consists of the “attitudes, beliefs, and rationalizations that offenders use to justify and support their criminal behavior” (Walters, 2012, p. 272). CT are identified as one of the “Big Four” predictors of recidivism (Andrews et al., 2006), and the concept has been integrated into risk assessments and cognitive behavioural treatment programmes for offenders (Vaske et al., 2017). CT seems to mediate the relationship between past and future criminal activity (Walters & DeLisi, 2013) and is associated with recidivism beyond variance accounted for by age and former crimes (Walters, 2012).

Criminal thinking and substance use. The effects of SU on the young adult brain can impair neurocognitive functions, increasing the tendency for risk-taking behaviour and disadvantageous decision-making based on immediately rewarding experiences while putting less worth in long-term consequences (Balogh et al., 2013). In addition, individuals with early age of substance use onset (ASO) accumulate more exposure to substance involvement and consequently are at higher risk of developing a SU problem compared to those with later onset (Winters & Lee, 2008). Similar to early ASO,

polysubstance use (PSU) has been found to be associated with an increased risk of problem behaviours, including crime (Kokkevi et al., 2014; Poudel & Gautam, 2017).

Involvement in both problematic SU and crime may increase the risk of adverse outcomes compared to involvement in problematic SU or crime only (Larm et al., 2015; Walters, 2014a). Concurrent crime and SU problems in young adulthood are associated with higher levels of CT than crime and SU problems alone (Walters, 2014a). Further, higher levels of CT serve as barriers to treatment engagement and completion (Bartholomew et al., 2018; Yang et al., 2013). The individual then focuses on these outside reasons for treatment, often viewing themselves as unfairly blamed and cast out from society (Hiller et al., 2009).

Criminal thinking and sex. Researchers who study sex differences in CT have produced conflicting results (Vaske et al., 2017). For instance, Walters (2002) found higher levels of CT among females than males, while both Holsinger et al. (2003) and Manchak et al. (2009) found no sex differences in CT. In contrast, others have found that males exhibit higher mean levels of CT than females (Andrews et al., 2012; Walters & Lowenkamp, 2016). Both Walters (2014b) and Vaske et al. (2017) found sex differences in the measurement of CT in their studies. They suggest that the measurement of CT may vary by sex due to differences in how males and females rate CT measurement items despite having the same latent level of CT (threshold parameters) (Vaske et al., 2017; Walters, 2014b). Another possible explanation of sex differences in CT is the “gender paradox”. The “gender paradox” hypothesis posits that a disorder with a lower occurrence in a particular sex may be associated with more severe symptoms, impairment, and co-morbidity in that sex (Eme, 1992). Accordingly, there may be fewer females with CT but they may have their functioning more severely impaired than their male counterparts.

Criminal thinking and young adults. Walters (2022) states that there is a change in CT between early adolescence and young adulthood. A moderating effect of CT regarding the perception of being punished has been found in a group of young adults (Walters, 2020; Walters & Morgan, 2019). This effect was not found among adolescents (Walters, 2020). Although increased age associated with lower levels of CT is the most consistent finding in this field of study (Mandrachia & Morgan, 2012), some studies have found no relationship between age and CT (Walters & Schlauch, 2008).

Findings show that CT is associated with impulsivity, antisocial traits, aggression, and criminality among college students (Mitchell et al., 2017; Ragatz et al., 2011). Adverse experiences impact the development of maladaptive cognitions such as CT (Cuadra et al., 2014; DeWall et al., 2009). Studies show that high exposure to adverse experiences in childhood is associated with risk behaviours, including SU and crime (Weber & Lynch, 2021). However, both crime and SU are also predictors of psychosocial problems and can enhance existing problems (Assink et al., 2015; Mitchell et al., 2016). When SU becomes the main focus of a person's life, discounting other activities, or begins to cause harm to the person and others, it increases the risk of being ignored or rejected by individuals or groups (social exclusion) (Semb et al., 2019; Sumnall & Brotherhood, 2012). Prolonged exposure to social exclusion depletes an individual's resources for coping and may exacerbate SU and symptoms of mental health problems (MHP) (Reinhard et al., 2020). Existing studies report an association between CT and MHP (Butt et al., 2019; Carr et al., 2009; Ragatz et al., 2011).

Current study

The psychosocial characteristics of the person are important factors in the process of recovery. This might include CT. Both CT and SU

problems are central risk and/or need factors predictive of future criminal behaviour. Despite this, little attention has been paid to CT among young adults in SU treatment. Though sex differences in CT have been found, this evidence has been inconsistent. To an extent, the same can be said about research on the association between age and CT.

As well as investigating the frequency of CT, another aim of the present study was to investigate the psychosocial and SU characteristics of young adults in SU treatment and to what extent cognitive processes, such as CT, are associated with the SU characteristics sex and age. By identifying the characteristics and risk factors of this young cohort of people in residential SU treatment, the study aimed to contribute to a better understanding, and thus provide a basis for discussion, of the needs of young adults in SU treatment and how interventions can be tailored specifically to this population.

Research questions:

1. What are the characteristics of young adults entering SU treatment regarding psychosocial problems, substance use, and criminal thinking?
2. To what extent is criminal thinking associated with the substance use characteristics sex and age in bivariate and multivariate regression models?

Materials and methods

Design

This was a retrospective study using data collected from electronic health records (EHR). We used a cross-sectional design to investigate the frequency of CT and to assess the factors associated with CT in young adults entering residential SU treatment.

Setting and sample

Setting. The sample was patients admitted to a Norwegian residential SU treatment institution between 2011 and 2016. The institution offers

interdisciplinary specialised treatment for young adults with SU problems. An extensive treatment programme is provided, inspired by 12-step programme techniques and therapeutic communities. The treatment programme integrates criminal risk factors in addition to MHP and SU problems. The institution is one of a few that offers long-term (3–12-month) residential SU treatment for young adults in Norway. It consists of 10 units, including two dual diagnosis (DD) units. The DD units offer treatment tailored to patients with concurrent SU problems and mental health disorders. The legal bases for treatment were Child Welfare Act, Specialist Health Service (SHS) Act, and the Execution of Sentences Act.

Sample and recruiting. The study was conducted on a non-probability sample. The sample included young adults who underwent an entry assessment during 2011–2016 at a residential SU treatment institution. Initially, 484 former residents were identified as potential study participants. A letter was distributed to former residents describing the nature of the study and asking them to contact the research team if they did not want to participate. Those who did not contact the research team to withdraw (via SMS, email, or mail) were deemed eligible to participate. The inclusion criteria included the following: aged 16–29 years; undergoing treatment during the study period; and having treatment last for at least 4 weeks. Among patients with more than one treatment episode during the study period, the first treatment episode lasting at least 4 weeks was included in the analyses. The exclusion criteria included declining participation. The analyses were based on a final sample of 407 patients. Among the others, 16 declined participation and the rest did not meet the other inclusion criteria.

Data collection and measures

The data collected were part of the routine assessment at admission for the residential SU treatment institution. At this assessment,

patients are presumed to have completed detoxification and are clinically stable, without withdrawal symptoms that may occur immediately after treatment admission. EHR data used herein were from three instruments: the Client-Mapping Form (CMF); the Achenbach System of Empirically Based Assessment (ASEBA); and the Psychological Inventory of Criminal Thinking Styles (PICTS).

The Client-Mapping form. The CMF was developed by the former Norwegian Institute for Substance Abuse Research (SIRUS). Used since the late 1990s, in 2009 it was integrated into the Norwegian Patient Registry (NPR). The NPR covers all public specialist health-care services in Norway (The Norwegian Directorate of Health, 2021). The CMF is a semi-structured interview that ensures comparable data across admissions for all treatment and care measures for SUD patients in Norway (Iversen et al., 2009; Skretting et al., 2011). The purpose of CMF is to elicit background information on patients as they enter SU treatment (e.g., SU characteristics, MHP, and socioeconomic status (SES)).

The Achenbach System of Empirically Based Assessment. The ASEBA was used to examine MHP and adaptive functioning (AF). AF refers to an individual's competence to cope with "everyday environmental demands including daily living skills that people perform to care for themselves and to interact with others" (Mitchell, 2018, pp. 33–34). Interests and activities in which the individual is involved are also part of the AF construct. The ASEBA includes standardised assessment instruments to assess AF and problems. It is well-validated and has been widely used to assess psychopathology (Achenbach, 2019; Rescorla & Achenbach, 2004; Semel, 2017; Strömbäck et al., 2015). Evidence points to a robustness of an underlying structure of MHP as measured by ASEBA, which is able to measure a person's proneness to MHP, persistence of MHP over time, and severity of

symptoms (Caspi & Moffitt, 2018; Clark et al., 2021; McElroy et al., 2018). Given that we were most interested in general patterns of psychosocial problems, we only used the broadband scale's total problems (TP; general psychopathology) and AF from the Youth Self Report (YSR; ages 11–18 years) and Adult Self Report (ASR; ages 18–59 years) forms. For the TP scale, cases were classified as normal (≤ 59), borderline (60–63), or clinical (≥ 64). For the AF scale, scoring 31–35 was classified as borderline and ≤ 30 as clinical range.

The Psychological Inventory of Criminal Thinking Styles. CT at treatment admission was measured using PICTS Version 4.0, an 80-item standardised self-report inventory designed to assess eight CT styles (Walters, 2002). Each item is scored using a 4-point Likert-type scale (response options: *strongly agree, agree, uncertain, disagree*). The PICTS has acceptable internal and retest reliability (Tonks & Stephenson, 2020). Support has been found for the validity of PICTS with adult prisoners and non-incarcerated young adults (McCoy et al., 2006; Tonks & Stephenson, 2020). The PICTS can be scored on three second-order scales; a total, General CT (GCT), Proactive CT, and Reactive CT scores. Herein, we only utilised the GCT score, given that we were most interested in general CT patterns. In addition, the GCT is considered the most reliable and stable among PICTS subscales (Walters, 2002; Walters & Mandell, 2007). The GCT can be divided into the following risk categories: low (T-score ≤ 40), low-moderate (T-score 41–49), high-moderate (T-score 50–59), and high (T-score ≥ 60). The PICTS was normed on low- to high-security federal prisoners (Walters, 2019). Thus, T-scores of 50 or higher indicate that GCT is significant, and the respondent is scoring higher than at least half the normative group.

Statistical analyses

Analyses were performed using SPSS Statistics version 27 (IBM Corp., Armonk, NY, USA)

and STATA version 16 software (College Station, TX, USA). Partial respondents versus non-respondents and females versus males were compared by independent samples t-test or chi-square test, as appropriate. A linear regression model with inverse probability weighting (IPW) was estimated. The model assessed the association between the SU characteristics sex and age, and PICTS GCT. IPW was implemented to minimise bias from a large number of missing values on covariates considered for regression analysis. Multicollinearity was assessed by inspecting correlations among covariates. Standard residual diagnostics was performed. All tests were two-sided and results with $p < .05$ were considered statistically significant.

Missing data. Data were missing for all variables except voluntary admission, sex, and age. Missing data was in the range of 35%–69%. Few patients were categorised as fully responding on the PICTS GCT model. Approximately one-quarter (22%) of patients had complete data on all variables in the PICTS GCT model. After excluding cases with at least one missing value on these variables, we were left with a sample of 90 of 161 for the PICTS model. Excluded cases meant more bias in the dataset. A weighted regression was run (IPW).

Ethics

The study protocol was approved by the Regional Ethics Committee of Medical Research (REK) in Norway (#2018/2197). All procedures were performed in accordance with the 1964 Helsinki Declaration and its later amendments. The Health Research Act includes an exemption clause, according to which REK may waive the requirement for consent when researchers wish to use health information collected by health services. REK granted exemption for this project but made it subject to a disclosure requirement pursuant to the Personal Data Act, cf. Article 13 of the Personal Data Regulations.

Results

Characteristics of young adults entering SU treatment

Characteristics of the young adults entering SU treatment are shown in Table 1. Almost all (91%) were ethnic Norwegian. More than half (65%) of the patients were males. The mean age at admission was 20.5 years. Most patients (67%) were admitted for voluntary treatment. One-fifth (21.6%) of the patients were admitted to a DD unit. Although clinical levels of MHP were commonly reported, female patients were more likely to report clinical levels of MHP than male patients ($p = .004$). There were no sex differences in depressive symptoms, episodes with delusions/hallucinations, use of medication for MHP, or suicide attempts. Data missingness was highly frequent in these covariates (67%–69% non-respondents). However, no sex differences were found in missingness on these covariates. Both sexes reported mean scores in the normal range on adaptive functioning ($T > 35$). Low SES was commonly reported. Most patients reported early ASO, PSU, and having received former SU and mental health treatment. Cannabis was the most frequently reported primary drug. Female patients reported harder SU ($p = .001$), but older ASO (14.3) than male patients (13.7) ($p = .05$). CT were frequently reported among this sample (Table 1). Of the patients, 91.42% reported elevated scores of CT (≥ 50) and almost three-fourth (72.67%) reported high levels (≥ 60) of CT. However, male patients were more likely to report high levels of CT compared to female patients ($p = .031$).

Factors associated with criminal thinking scores

Bivariate and multiple regression models were carried out to assess to what extent the SU characteristics sex and age are associated with mean levels of CT (Table 2). In bivariate regression models, only sex and having stimulants/opioids as primary drug were associated with

mean levels of CT. The same was true for the multiple regression model, indicating that more severe SU and being male remained significantly associated with higher levels of CT when all other variables were held constant.

Discussion

The aims of the present study were to assess the psychosocial characteristics, SU problems, and CT that young adults in residential SU treatment have, and whether SU characteristics, sex and age are associated with CT scores.

High rates of MHP, low SES, early ASO, and PSU were commonly reported among this sample of young adults. Thus, the characteristics of this clinical cohort represent typical clinical and psychosocial characteristics of young adults in residential SU treatment (Comandule et al., 2019; Winters et al., 2014). A high frequency of CT was found in this sample, indicating high levels of maladaptive cognitions that might interfere with the ability to engage in and follow treatment (Bartholomew et al., 2018; Yang et al., 2013) and an increased risk for criminality (Walters, 2012). A potential explanation of this finding might be that SU places young adults at higher risk of deviant peer associations (Boduszek et al., 2013; Whited et al., 2017), problem behaviours including crime (Brunelle et al., 2014), and that adverse experiences are commonly presented among this population (Shin et al., 2018; Weber & Lynch, 2021). These factors are expected to increase the risk of developing or maintaining CT.

The results herein demonstrate that males and individuals with harder SU have higher levels of CT than females and individuals with softer SU. This is in line with the research of Brunelle et al. (2014), showing that the SU-crime association is stronger when using stimulants. Moreover, harder SU is often more expensive than softer SU, which can elevate the risk of offending in order to finance their SU (Brunelle et al., 2014). Another explanation could be that the combination is caused by underlying factors such as family dysfunction,

Table 1. Sample characteristics.

| | Valid n | Total (N= 407) | Females (n= 144) | Males (n= 263) | p-value |
|---|---------|-------------------|---------------------|-------------------|-------------------|
| Age at treatment admission (years) | 407 | 20.46±3.23 | 20.01±3 | 20.7±3.32 | .038 ^a |
| Voluntary admission, yes | 407 | 273 (67.08) | 93 (64.58) | 180 (68.44) | .383 ^b |
| Child Welfare Act as legal basis | 407 | 155 (38.08) | 59 (40.97) | 96 (36.50) | .375 ^b |
| Admitted to a dual diagnosis unit, yes | 407 | 88 (21.62) | 35 (24.31) | 53 (20.15) | .330 ^b |
| <i>Socioeconomic status</i> | | | | | |
| Educational attainment, primary school, or lower | 133 | 95 (71.43) | 34 (73.91) | 61 (70.11) | .645 ^b |
| Main source of income, welfare benefits | 135 | 101 (76.38) | 34 (72.34) | 67 (76.14) | .628 ^b |
| Employment status, unemployed/not in education | 127 | 97 (76.38) | 31 (68.89) | 66 (80.49) | .141 ^b |
| <i>Mental health problems and adaptive functioning</i> | | | | | |
| In the last 4 weeks before entering treatment have you had: | | | | | |
| Severe anxiety, yes | 133 | 61 (45.86) | 27 (58.7) | 34 (39.08) | .031 ^b |
| Severe depressions, yes | 134 | 50 (37.31) | 20 (42.55) | 30 (34.48) | .357 ^b |
| Delusions or hallucinations, yes | 129 | 35 (27.13) | 13 (28.89) | 22 (26.19) | .743 ^b |
| Been prescribed medication for MHP, yes | 133 | 65 (48.87) | 24 (52.17) | 41 (47.13) | .58 ^b |
| Suicidal thoughts, yes | 132 | 29 (21.97) | 15 (33.33) | 14 (16.09) | .023 ^b |
| Have you ever: | | | | | |
| Had suicide attempts, yes | 125 | 65 (52) | 28 (62.22) | 37 (46.25) | .086 ^b |
| Received professional Mental Health Service, yes | 124 | 102 (82.26) | 42 (91.3) | 60 (76.92) | .043 ^b |
| Been in some form of SU treatment previously, yes | 116 | 80 (68.97) | 33 (76.74) | 47 (64.38) | .165 ^b |
| YSR/ASR TP | 263 | 67.58 ±10.57 | 70.72±9.41 | 66.09 ±10.78 | .001 ^a |
| Normal (≤59) | | 45 (17.11) | 10 (11.90) | 35 (19.55) | .125 ^b |
| Borderline (60–63) | | 40 (15.21) | 7 (8.33) | 33 (18.44) | .033 ^b |
| Clinical (≥64) | | 178 (67.68) | 67 (79.76) | 111 (62.01) | .004 ^b |
| YSR/ASR AF | 235 | 36.99 ±10.83 | 36.89 ±10.88 | 36.85 ±10.94 | .927 ^a |
| Normal (≥36) | | 106 (45.11) | 32 (43.84) | 74 (45.68) | .793 ^b |
| Borderline (31–35) | | 43 (18.30) | 16 (21.92) | 27 (16.67) | .335 ^b |
| Clinical (≤30) | | 86 (36.60) | 25 (34.25) | 61 (37.65) | .616 ^b |
| <i>Substance use characteristics</i> | | | | | |
| ASO (years) | 191 | 13.92±.16 | 14.34±.29 | 13.69±.19 | .05 ^a |
| Primary drug | 230 | | | | |
| Cannabis | | 128 (55.9) | 36 (43.37) | 92 (63.01) | .004 ^b |
| Stimulants | | 40 (17.47) | 24 (28.92) | 16 (10.96) | .001 ^b |
| Opioids | | 23 (10.04) | 8 (9.64) | 15 (10.27) | .878 ^b |
| Alcohol | | 22 (9.61) | 9 (10.84) | 13 (8.9) | .632 ^b |
| Other ^c | | 16 (6.99) | 6 (7.23) | 10 (6.85) | .914 ^b |
| PSU | 233 | 198 (85) | 73 (80.2) | 125 (88) | .104 ^b |
| <i>Criminal thinking</i> | | | | | |
| PICTS GCT | 161 | 66.25 ±12.28 | 61.37 ±10.64 | 68.41 ±12.39 | .001 ^a |
| Low (≤40) | | 6 (3.75) | 2 (4.08) | 4 (3.60) | .883 ^b |

(continued)

Table 1. (continued)

| | Valid n | Total (N = 407) | Females (n = 144) | Males (n = 263) | p-value |
|-----------------------|---------|--------------------|----------------------|--------------------|-------------------|
| Low-moderate (41–49) | | 8 (5.00) | 4 (8.16) | 4 (3.60) | .223 ^b |
| High-moderate (50–59) | | 30 (18.75) | 13 (26.53) | 17 (15.32) | .094 ^b |
| High (≥60) | | 117 (72.67) | 30 (61.22) | 87 (77.68) | .031 ^b |

Note. Values are given as n (%) or mean ± SD. AF = adaptive functioning; ASO = age of substance use onset; ASR = Adult Self Report; GCT = general criminal thinking; PICTS = Psychological Inventory of Criminal Thinking Styles; PSU = polysubstance use; SD = standard deviation; SU = substance use; TP = total problems; YSR = Youth Self Report.

^ap-value included t-test. ^bp-value included chi-square test. ^cIncludes benzodiazepines, other addictive drugs, psychedelics (e.g., LSD), ecstasy and other synthetic drugs, GHB/GBL, and anabolic androgenic steroids.

Table 2. Weighted regression models for the association between substance use characteristics sex, age, and criminal thinking (*n* = 90).

| Variable | Bivariate models | | Multiple regression model | |
|--------------------|----------------------------------|---------|---------------------------------|---------|
| | Regression coefficient. (95% CI) | p-value | Regression coefficient (95% CI) | p-value |
| Primary drug | | | | |
| Stimulants/opioids | 6.88 (0.63, 13.14) | .031 | 9.25 (2.83, 15.67) | .005 |
| Cannabis (ref.) | 0 | | 0 | |
| Other ^a | 5.31 (−1.91, 12.53) | .147 | 4.67 (−2.38, 11.71) | .192 |
| ASO | 0.43 (−0.90, 1.76) | .521 | 0.12 (−1.16, 1.40) | .851 |
| PSU | 2.23 (−6.47, 10.93) | .612 | −2.48 (−11.13, 6.17) | .571 |
| Sex, female | −7.27 (−12.30, −2.23) | .005 | −9.19 (−14.56, −3.83) | .001 |
| Age | 0.11 (−0.61, 0.82) | .772 | −0.31 (−1.02, 0.39) | .379 |

Note. ASO = age of substance use onset; CI = confidence interval; PSU = polysubstance use.

^aIncludes benzodiazepines, other addictive drugs, psychedelics (e.g., LSD), ecstasy and other synthetic drugs, GHB/GBL, and anabolic androgenic steroids.

early adverse experiences, school difficulties, and MHP (Assink et al., 2015). In addition, more severe SU places females at a higher risk of various adverse experiences, including the risk of victimisation in part as a result of living in a male-dominated environment. Despite females reported harder SU, they reported significantly lower levels of CT than males. Nevertheless, less severe CT can be problematic because they can still lead to maladaptive behaviour and impact on other determinants of health. When females develop SU problems, they deviate more from societal norms compared with males (Hecksher & Hesse, 2009). CT may preserve and exacerbate difficulties in social functioning (Mitchell et al.,

2017), leading to an increased risk of social exclusion. Thus, females with severe SU problems, CT in addition to MHP, have a higher risk for comprehensive stigmatisation and social exclusion than males (EMCDDA, 2003). For instance, it is more socially accepted for males to show aggressive, promiscuous, or risk-taking behaviour compared to females. These potential explanations of the relationship between CT, sex, and severity of SU are consistent with the notion posited by Reinhard et al. (2020), that prolonged exposure to social exclusion leads to a cycle of exacerbated symptoms and further exclusion. The “gender paradox” hypothesis (Eme, 1992) may be another explanation. Despite a lower proportion

of females entering SU treatment compared to males, they tend to report more experiences that are adverse and show more psychosocial complexity (Hecksher & Hesse, 2009; Mitchell et al., 2016; Weber & Lynch, 2021). This is supported by the present study, where it was more common for females to have received mental health service and to report more severe MHP. There was no sex difference in the former use of SU treatment, indicating a higher use of treatment among females compared to males.

Although the most consistent finding in this field of study is that young age is associated with higher levels of CT, no relationship was found in the present study between CT and age. This may have been due to a young mean age at treatment entry (20.5 years) or to admission criteria of the treatment institution. As with the sample in the study by Walters and Schlauch (2008), the present study sample entered a setting where CT was routinely assessed. The treatment integrates criminal risk factors in addition to MHP and SU problems. The individuals in the present study have presumably many shared risk factors that heighten the risk of developing CT. For instance, most of the sample reported early ASO and PSU. Individuals with early ASO are more exposed to substance involvement and consequently are at higher risk of developing SU problems compared to those with later SU onset (Mitchell et al., 2016; Winters & Lee, 2008). High levels of MHP and low SES were other potentially shared risk factors that could explain, at least to some degree, the non-association between age and CT. The results herein indicate that these young individuals are a multi-problem high risk/high-need group aligned with the youths in the study by Walters (2014a). Compared with youths who reported engaging in either behaviour alone, those with ongoing criminal and SU problems were significantly more likely to experience a range of adjustment difficulties including MHP and subsequent problems with crime and SU (Walters, 2014a).

Clinical implications

Individuals entering SU treatment should be screened for criminogenic treatment needs such as CT, regardless of justice involvement. Ultimately, the identification of and improvement of maladaptive cognitions may help the cycle of risk behaviour within this population. Individuals who report concurrent MHP, SU problems, and criminogenic treatment needs would necessitate treatment that integrates criminal risk factors in addition to MHP and SU problems. Treatments targeting cognitive processes and maladaptive thinking patterns, in addition to regulating emotions, impulse control, and interpersonal skills, can prove to be particularly useful interventions. This group of young adults is presumed to be in need of treatment that focuses on outcomes related to social reintegration, such as promoting strong connection to and involvement in groups in the community and activities that promotes a sense of meaning and well-being. Measures that address the education, vocational, and everyday life needs are other crucial reintegration complements. However, it is unlikely that any single treatment intervention can affect so many different aspects of a person's life. Our findings underline the importance of integrated interventions that are need-adapted. As females tend to have a greater psychosocial burden when entering SU treatment compared to males, they may also need more extensive treatment interventions that run over a longer period of time (Brunelle et al., 2014). When re-entering the community, continuity of care is seen as essential for these young adults (McKay, 2021).

Strengths and limitations

The present study has some limitations, mainly involving missingness. Some of the missingness was due to the different legal basis for treatment entry. For instance, those with the Child Welfare Act as the legal basis for treatment entry were not obligated to fill out the CMF compared to those with SHS Act as

the legal basis. High rates of missing data may lead to attrition bias. Although we found no differences in the demographic variables between participants and non-participants, there may be systematic differences between the groups. When most information is missing, the standard approach is to estimate each respondent's probability of participating and assign them a weight inversely proportionate to this probability (Höfler et al., 2005). In this way, we can largely control bias. The crucial issue in the analyses of weighted data is that statistical weights do not represent true numbers of observations, only expected numbers.

The cross-sectional design and use of EHR allowed us to use data from a large sample and to compare between-group differences. Because the presence of explanatory factors and outcomes are measured simultaneously, the cross-sectional design is limited in its ability to make causal inferences. To achieve a better understanding of the temporal associations between variables of interest, future research should consider employing longitudinal designs. Future research is also warranted to examine whether interventions can affect SU directly and indirectly by affecting changes in CT. The typical procedure before entering residential SUD treatment in Norway is to be admitted to a detoxification unit. Since we have no information as to whether this was the case for this entire sample, we cannot rule out the possibility that results were linked to withdrawal symptoms.

Regarding the PICTS, it has been translated into Norwegian although there is no published research where normative data are available. Caution is needed to ensure that the levels of CT in young adults are compared to the appropriate standard in order to avoid inaccurate characterisation of CT. This, along with having two high-response options, can increase the likelihood for over-pathologisation. Normative data from a Norwegian sample incorporating sex and age as additional variables should be obtained. However, research has shown the potential use of the PICTS with non-incarcerated young adults (McCoy et al., et al.,

2006). Due to the PICTS in this cohort being administered on paper, the data collected needed to be entered manually. In addition to being time-consuming, data entry of a paper questionnaire can significantly increase the cost of the project. Due to this and our interest in general patterns of CT within this population, only the aggregated scores of GCT were obtained from the PICTS. The GCT score is considered the most reliable and stable among PICTS subscales (Walters, 2002; Walters & Mandell, 2007). Nevertheless, interpretation of aggregated scores may be less concise compared to using all the subscales in a measurement. Additional research is needed to establish which specific CT styles may or may not be associated with psychosocial problems and SU characteristics, and to get a better understanding of the sex differences found in this study.

Conclusion

Severe SU problems, MHP, elevated CT, and low SES indicate that these young adults are a multi-problem high-risk/high-need group. Due to the high frequencies of CT found in this sample, we recommend that young adults in SU treatment should be screened for criminogenic treatment needs such as CT, regardless of justice involvement. Individuals who report concurrent MHP, SU problems, and CT would necessitate treatment that integrates criminal risk factors in addition to MHP and SU problems.

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References

- Achenbach, T. M. (2019). International findings with the achenbach system of empirically based assessment (ASEBA): Applications to clinical services, research, and training. *Child and Adolescent Psychiatry and Mental Health*, 13(1), 30. <https://doi.org/10.1186/s13034-019-0291-2>
- Andrews, D. A., Bonta, J. & Wormith, J. S. (2006). The recent past and near future of risk and/or need assessment. *Crime & Delinquency*, 52(1), 7–27. <https://doi.org/10.1177/0011128705281756>
- Andrews, D. A., Guzzo, L., Raynor, P., Rowe, R. C., Rettinger, L. J., Brews, A. & Wormith, J. S. (2012). Are the major risk/need factors predictive of both female and male reoffending?: A test with the eight domains of the level of service/case management inventory. *International Journal Of Offender Therapy And Comparative Criminology*, 56(1), 113–133. <https://doi.org/10.1177/0306624x10395716>
- Assink, M., van der Put, C. E., Hoeve, M., de Vries, S. L., Stams, G. J. J. & Oort, F. J. (2015). Risk factors for persistent delinquent behavior among juveniles: A meta-analytic review. *Clinical Psychology Review*, 42, 47–61. <https://doi.org/10.1016/j.cpr.2015.08.002>
- Balogh, K. N., Mayes, L. C. & Potenza, M. N. (2013). Risk-taking and decision-making in youth: relationships to addiction vulnerability. *Journal of Behavioral Addictions*, 2(1), 1–9. <https://doi.org/10.1556/jba.2.2013.1.1>
- Bartholomew, N. R., Morgan, R. D., Mitchell, S. M. & Van Horn, S. A. (2018). Criminal thinking, psychiatric symptoms, and recovery attitudes among community mental health patients: An examination of program placement. *Criminal Justice And Behavior*, 45(2), 195–213. <https://doi.org/10.1177/0093854817734007>
- Beck, A. T. (1979). *Cognitive therapy and the emotional disorders*. Penguin.
- Best, D., Day, E., Campbell, A., Flynn, P. M. & Simpson, D. D. (2009). Relationship between drug treatment engagement and criminal thinking style among drug-using offenders. *European Addiction Research*, 15(2), 71–77. <https://doi.org/10.1159/000189785>
- Boduszek, D., Adamson, G., Shevlin, M., Hyland, P. & Bourke, A. (2013). The role of criminal social identity in the relationship between criminal friends and criminal thinking style within a sample of recidivistic prisoners. *Journal of Human Behavior in the Social Environment*, 23(1), 14–28. <https://doi.org/10.1080/10911359.2013.737289>
- Braatveit, K. J., Torsheim, T. & Hove, O. (2018). Intellectual functioning in in-patients with substance use disorders: Preliminary results from a clinical mediation study of factors contributing to IQ variance. *European Addiction Research*, 24(1), 19–27. <https://doi.org/10.1159/000486620>
- Brunelle, N., Bertrand, K., Beaudoin, I., Ledoux, C., Gendron, A. & Arseneault, C. (2013). Drug trajectories among youth undergoing treatment: The influence of psychological problems and delinquency. *Journal of Adolescence*, 36(4), 705–716. <https://doi.org/10.1016/j.adolescence.2013.05.009>
- Brunelle, N., Tremblay, J., Blanchette-Martin, N., Gendron, A. & Tessier, M. (2014). Relationships between drugs and delinquency in adolescence: Influence of gender and victimization experiences. *Journal of Child & Adolescent Substance Abuse*, 23(1), 19–28. <https://doi.org/10.1080/1067828X.2012.735488>
- Butt, A., Abdi, S. K., Hamid, A., Dogar, F. A. & Fatima, J. (2019). Criminal thinking, moral disengagement and psychological wellbeing in prisoners. *Journal of Fatima Jinnah Medical University*, 13(2), 51–54.
- Carr, W. A., Rosenfeld, B., Magyar, M. & Rotter, M. (2009). An exploration of criminal thinking styles among civil psychiatric patients. *Criminal Behaviour and Mental Health*, 19(5), 334–346. <https://doi.org/10.1002/cbm.749>

- Caspi, A. & Moffitt, T. E. (2018). All for one and one for all: Mental disorders in one dimension. *American Journal of Psychiatry*, *175*(9), 831–844. <https://doi.org/10.1176/appi.ajp.2018.17121383>
- Clark, D. A., Hicks, B. M., Angstadt, M., Rutherford, S., Taxali, A., Hyde, L., Weigard, A., Heitzeg, M. M. & Sripada, C. (2021). The general factor of psychopathology in the adolescent brain cognitive development (ABCD) study: A comparison of alternative modeling approaches. *Clinical Psychological Science*, *9*(2), 169–182. <https://doi.org/10.1177/2167702620959317>
- Comandule, A. Q., Padin, M. d. F. R., Canfield, M. J. & Laranjeira, R. (2019). Substance using adolescents admitted to inpatient treatment: characteristics and factors associated with length of time in treatment. *Adicciones*. <http://dx.doi.org/10.20882/adicciones.1204>
- Cuadra, L. E., Jaffe, A. E., Thomas, R. & DiLillo, D. (2014). Child maltreatment and adult criminal behavior: Does criminal thinking explain the association? *Child Abuse & Neglect*, *38*(8), 1399–1408. <https://doi.org/10.1016/j.chiabu.2014.02.005>
- De Leon, G. (2000). *The therapeutic community: Theory, model, and method*. Springer Publishing Company. <https://doi.org/10.1891/9780826116673>
- DeWall, C. N., Twenge, J. M., Gitter, S. A. & Baumeister, R. F. (2009). It's the thought that counts: The role of hostile cognition in shaping aggressive responses to social exclusion. *Journal of Personality and Social Psychology*, *96*(1), 45–59. <https://doi.org/10.1037/a0013196>
- EMCDDA. (2003). Social exclusion and reintegration. In *EMCDDA 2003 annual report on the state of the drugs problem in the European Union and Norway* (pp. 65–68). EMCDDA, Lisbon. https://www.emcdda.europa.eu/publications/annual-report/2003_en
- Eme, R. F. (1992). Selective female affliction in the developmental disorders of childhood: A literature review. *Journal of Clinical Child Psychology*, *21*(4), 354–364. https://doi.org/10.1207/s15374424jccp2104_5
- Garner, B. R., Knight, K., Flynn, P. M., Morey, J. T. & Simpson, D. D. (2007). Measuring offender attributes and engagement in treatment using the client evaluation of self and treatment. *Criminal Justice And Behavior*, *34*(9), 1113–1130. <https://doi.org/10.1177/0093854807304345>
- Grella, C. E., Hser, Y.-I., Joshi, V. & Rounds-Bryant, J. (2001). Drug treatment outcomes for adolescents with comorbid mental and substance use disorders. *The Journal Of Nervous And Mental Disease*, *189*(6), 384–392. <https://doi.org/10.1097/00005053-200106000-00006>
- Hecksher, D. & Hesse, M. (2009). Women and substance use disorders. *Mens Sana Monographs*, *7*(1), 50–62. <https://doi.org/10.4103/0973-1229.42585>
- Hiller, M. L., Narevic, E., Webster, J. M., Rosen, P., Staton, M., Leukefeld, C., Garrity, T. F. & Kayo, R. (2009). Problem severity and motivation for treatment in incarcerated substance abusers. *Substance Use & Misuse*, *44*(1), 28–41. <https://doi.org/10.1080/10826080802523301>
- Höfler, M., Pfister, H., Lieb, R. & Wittchen, H.-U. (2005). The use of weights to account for non-response and drop-out. *Social Psychiatry And Psychiatric Epidemiology*, *40*(4), 291–299. <https://doi.org/10.1007/s00127-005-0882-5>
- Holsinger, A. M., Lowenkamp, C. T. & Latessa, E. J. (2003). Ethnicity, gender, and the level of service inventory-revised. *Journal of Criminal Justice*, *31*(4), 309–320. [https://doi.org/10.1016/S0047-2352\(03\)00025-4](https://doi.org/10.1016/S0047-2352(03)00025-4)
- Hser, Y.-I., Hoffman, V., Grella, C. E. & Anglin, M. D. (2001). A 33-year follow-up of narcotics addicts. *Archives of General Psychiatry*, *58*(5), 503–508. <https://doi.org/10.1001/archpsyc.58.5.503>
- Iversen, E., Lauritzen, G. O., Skretting, A. & Skutle, A. (2009). Det nasjonale dokumentasjonssystemet innen tiltaksapparatet for rusmiddelmissbrukere 2009. Klientkartleggingsdata. Nettrapport 2008 [The national documentation system within the help services for clients with substance abuse 2009. Client mapping data. Online report 2008]. <http://hdl.handle.net/11250/276048>
- Knight, K., Garner, B. R., Simpson, D. D., Morey, J. T. & Flynn, P. M. (2006). An assessment for

- criminal thinking. *Crime & Delinquency*, 52(1), 159–177. <https://doi.org/10.1177/0011128705281749>
- Kokkevi, A., Kanavou, E., Richardson, C., Fotiou, A., Papadopoulou, S., Monshouwer, K., Matias, J. & Olszewski, D. (2014). Polydrug use by European adolescents in the context of other problem behaviours. *Nordic Studies on Alcohol and Drugs*, 31(4), 323–342. <https://doi.org/10.2478/nsad-2014-0026>
- Larm, P., Silva, T. C. & Hodgins, S. (2015). Adolescent substance misusers with and without delinquency: Death, mental and physical disorders, and criminal convictions from age 21 to 45. *Journal of Substance Abuse Treatment*, 59, 1–9. <https://doi.org/10.1016/j.jsat.2015.06.009>
- Manchak, S. M., Skeem, J. L., Douglas, K. S. & Siranosian, M. (2009). Does gender moderate the predictive utility of the level of service inventory—revised (LSI-R) for serious violent offenders? *Criminal Justice and Behavior*, 36(5), 425–442. <https://doi.org/10.1177/0093854809333058>
- Mandracchia, J. T. & Morgan, R. D. (2012). Predicting offenders’ criminogenic cognitions with Status variables. *Criminal Justice And Behavior*, 39(1), 5–25. <https://doi.org/10.1177/0093854811425453>
- McCoy, K., Fremouw, W., Tyner, E., Clegg, C., Johansson-Love, J. & Strunk, J. (2006). Criminal-thinking styles and illegal behavior among college students: Validation of the PICTS*. *Journal of Forensic Sciences*, 51(5), 1174–1177. <https://doi.org/10.1111/j.1556-4029.2006.00216.x>
- McElroy, E., Belsky, J., Carragher, N., Fearon, P. & Patalay, P. (2018). Developmental stability of general and specific factors of psychopathology from early childhood to adolescence: Dynamic mutualism or p-differentiation? *Journal of Child Psychology and Psychiatry*, 59(6), 667–675. <https://doi.org/10.1111/jcpp.12849>
- McKay, J. R. (2021). Impact of continuing care on recovery from substance use disorder. *Alcohol Research*, 41(1), 1. <https://doi.org/10.35946/arcr.v41.1.01>
- Mitchell, E. (2018). Adaptive functioning. In Bornstein, M. H. (Ed.), *The SAGE encyclopedia of lifespan human development* (pp. 33–34). Sage Publications, Inc. <https://doi.org/10.4135/9781506307633>
- Mitchell, P. F., Kutin, J. J., Daley, K., Best, D. & Bruun, A. J. (2016). Gender differences in psychosocial complexity for a cohort of adolescents attending youth-specific substance abuse services. *Children and Youth Services Review*, 68, 34–43. <https://doi.org/10.1016/j.childyouth.2016.06.016>
- Mitchell, S. M., Bartholomew, N. R., Morgan, R. D. & Cukrowicz, K. C. (2017). A preliminary investigation of the psychological inventory of criminal thinking styles—layperson edition—short form. *Criminal Justice and Behavior*, 44(5), 756–769. <https://doi.org/10.1177/0093854816685591>
- Parolin, M., Simonelli, A., Cristofalo, P., Sacco, M., Bacciardi, S., Maremmi, A., Cimino, S., Trumello, C. & Cerniglia, L. (2017). Drug addiction and emotional dysregulation in young adults. *Heroin Addiction and Related Clinical Problems*, 19(3), 37–48.
- Poudel, A. & Gautam, S. (2017). Age of onset of substance use and psychosocial problems among individuals with substance use disorders. *BMC Psychiatry*, 17(1), 1–7. <https://doi.org/10.1186/s12888-016-1191-0>
- Ragatz, L. L., Anderson, R. J., Fremouw, W. & Schwartz, R. (2011). Criminal thinking patterns, aggression styles, and the psychopathic traits of late high school bullies and bully-victims. *Aggressive Behavior*, 37(2), 145–160. <https://doi.org/10.1002/ab.20377>
- Reinhard, M. A., Dewald-Kaufmann, J., Wuestenberg, T., Musil, R., Barton, B. B., Jobst, A. & Padberg, F. (2020). The vicious circle of social exclusion and psychopathology: A systematic review of experimental ostracism research in psychiatric disorders. *European Archives of Psychiatry and Clinical Neuroscience*, 270(5), 521–532. <https://doi.org/10.1007/s00406-019-01074-1>
- Rescorla, L. & Achenbach, T. (2004). The Achenbach System of Empirically Based Assessment (ASEBA) for Ages 18 to 90 Years. In *The use of psychological testing for treatment planning and outcomes assessment: Instruments for adults*, (Vol. 3, 3rd ed., pp. 115–152). Lawrence Erlbaum Associates Publishers.

- Semb, R., Tjora, A. & Borg, M. (2019). Communal invalidation of young adults with co-occurring substance abuse and mental health issues. *Disability & Society*, 34(6), 926–944. <https://doi.org/10.1080/09687599.2019.1584089>
- Semel, R. (2017). Utility of the ASEBA youth self-report (YSR) in juvenile delinquency assessments. *EC Psychology and Psychiatry*, 1(6), 217–225.
- Shin, S. H., McDonald, S. E. & Conley, D. (2018). Patterns of adverse childhood experiences and substance use among young adults: A latent class analysis. *Addictive Behaviors*, 78, 187–192. <https://doi.org/10.1016/j.addbeh.2017.11.02>
- Sieving, R. E., Perry, C. L. & Williams, C. L. (2000). Do friendships change behaviors, or do behaviors change friendships? Examining paths of influence in young adolescents' alcohol use. *Journal of Adolescent Health*, 26(1), 27–35. [https://doi.org/10.1016/s1054-139x\(99\)00056-7](https://doi.org/10.1016/s1054-139x(99)00056-7)
- Skretting, A., Storvoll, E., Rise, J., Lauritzen, G. O., Snertingdal, M. I., Amundsen, E. J. & Skjælaaen, Ø., Østhus, S., Bye, E. K., & Rossow, I. (2011). *Utviklingstrekk på rusmiddelfeltet: grunnlagsmateriale til regjeringens stortingsmelding om rusmiddelpolitikken [Development trends in the field of drugs: supporting materials for the Government's report on drug policy]* (8271713671). <http://hdl.handle.net/11250/276010>
- Smith, D. K. & Saldana, L. (2013). Trauma, delinquency, and substance use: Co-occurring problems for adolescent girls in the juvenile justice system. *Journal of Child & Adolescent Substance Abuse*, 22(5), 450–465. <https://doi.org/10.1080/1067828X.2013.788895>
- Strömbäck, M., Wiklund, M., Salander Renberg, E. & Malmgren-Olsson, E. B. (2015). Complex symptomatology among young women who present with stress-related problems. *Scandinavian Journal Of Caring Sciences*, 29(2), 234–247. <https://doi.org/10.1111/scs.12154>
- Sumnall, H. & Brotherhood, A. (2012). *Social reintegration and employment: evidence and interventions for drug users in treatment* (Vol. 13). Publications Office of the European Union Luxembourg City. https://www.emecdda.europa.eu/publications/insights/social-reintegration_en
- The Norwegian Directorate of Health. (2021). *Norsk Pasient Register (NPR)*. <https://www.helsedirektoratet.no/tema/statistikk-registregog-rapporter/helsedata-og-helseregistre/norsk-pasientregister-npr>
- Tonks, S. & Stephenson, Z. (2020). Critique of the psychological inventory of criminal thinking styles. *International Journal Of Offender Therapy And Comparative Criminology*, 64(9), 903–921. <https://doi.org/10.1177/0306624x19870646>
- Tucker, J. S., Ellickson, P. L., Collins, R. L. & Klein, D. J. (2006). Does solitary substance use increase adolescents' risk for poor psychosocial and behavioral outcomes? A 9-year longitudinal study comparing solitary and social users. *Psychology of Addictive Behaviors*, 20(4), 363–372. <https://doi.org/10.1037/0893-164X.20.4.363>
- Vaske, J. C., Gehring, K. S. & Lovins, B. (2017). Gender differences in the measurement of criminal thinking. *Criminal Justice And Behavior*, 44(3), 395–415. <https://doi.org/10.1177/0093854816677311>
- Walters, G. D. (2002). The psychological inventory of criminal thinking styles (PICTS) A review and meta-analysis. *Assessment*, 9(3), 278–291. <https://doi.org/10.1177/1073191102009003007>
- Walters, G. D. (2012). Criminal thinking and recidivism: Meta-analytic evidence on the predictive and incremental validity of the psychological inventory of criminal thinking styles (PICTS). *Aggression and Violent Behavior*, 17(3), 272–278. <https://doi.org/10.1016/j.avb.2012.02.010>
- Walters, G. D. (2014a). Crime and substance misuse in adjudicated delinquent youth: The worst of both worlds. *Law and Human Behavior*, 38(2), 139–150. <https://doi.org/10.1037/lhb0000050>
- Walters, G. D. (2014b). An item response theory analysis of the psychological inventory of criminal thinking styles: Comparing male and female probationers and prisoners. *Psychological Assessment*, 26(3), 1050–1055. <https://doi.org/10.1037/pas0000014>
- Walters, G. D. (2015a). Criminal and substance involvement from adolescence to adulthood: Precursors, mediators, and long-term effects. *Justice Quarterly*, 32(4), 729–747. <https://doi.org/10.1080/07418825.2014.890736>

- Walters, G. D. (2015b). Recidivism and the “worst of both worlds” hypothesis: Do substance misuse and crime interact or accumulate? *Criminal Justice and Behavior*, 42(4), 435–451. <https://doi.org/10.1177/0093854814551018>.
- Walters, G. D. (2016). Friends, cognition, and delinquency: Proactive and reactive criminal thinking as mediators of the peer influence and peer selection effects among male delinquents. *Justice Quarterly*, 33(6), 1055–1079. <https://doi.org/10.1080/07418825.2015.1039048>
- Walters, G. D. (2019). Criminal thinking: Theory and practice. In Polaschek, D. L. L., Day, A., & Hollin, C. R. (Eds.), *The Wiley International Handbook Of Correctional Psychology* (pp. 637–653). <https://doi.org/10.1002/9781119139980.ch40>
- Walters, G. D. (2020). Criminal thinking as a moderator of the perceived certainty–offending relationship: Age variations. *Psychology, Crime & Law*, 26(3), 267–286. <https://doi.org/10.1080/1068316X.2019.1652749>
- Walters, G. D. (2022). Changes in criminal thinking from midadolescence to early adulthood: Does trajectory direction matter? *Law and Human Behavior*, 46(2), 154–163. <https://doi.org/10.1037/lhb0000468>
- Walters, G. D. & DeLisi, M. (2013). Antisocial cognition and crime continuity: Cognitive mediation of the past crime-future crime relationship. *Journal of Criminal Justice*, 41(2), 135–140. <https://doi.org/https://doi.org/10.1016/j.jcrimjus.2012.12.004>
- Walters, G. D. & Lowenkamp, C. T. (2016). Predicting recidivism with the psychological inventory of criminal thinking styles (PICTS) in community-supervised male and female federal offenders. *Psychological Assessment*, 28(6), 652–659. <https://doi.org/10.1037/pas0000210>
- Walters, G. D. & Mandell, W. (2007). Incremental validity of the psychological inventory of criminal thinking styles and psychopathy checklist: Screening version in predicting disciplinary outcome. *Law and Human Behavior*, 31(2), 141–157. <https://doi.org/10.1007/s10979-006-9051-y>
- Walters, G. D. & Morgan, R. D. (2019). Certainty of punishment and criminal thinking: Do the rational and non-rational parameters of a student’s decision to cheat on an exam interact? *Journal of Criminal Justice Education*, 30(2), 276–295. <https://doi.org/10.1080/10511253.2018.1488982>.
- Walters, G. D. & Schlauch, C. (2008). The psychological inventory of criminal thinking styles and level of service inventory-revised: Screening version as predictors of official and self-reported disciplinary infractions. *Law and Human Behavior*, 32(5), 454–462. <https://doi.org/10.1007/s10979-006-9051-y>
- Weber, S. & Lynch, S. (2021). Understanding the relations among adverse childhood experiences (ACE), substance use, and reoffending among detained youth. *Child Abuse & Neglect*, 120, 105211. <https://doi.org/10.1016/j.chiabu.2021.105211>
- Whited, W. H., Wagar, L., Mandracchia, J. T. & Morgan, R. D. (2017). Partners or partners in crime? The relationship between criminal associates and criminogenic thinking. *International Journal of Offender Therapy and Comparative Criminology*, 61(5), 491–507. <https://doi.org/10.1177/0306624X15599605>
- Winters, K. C. & Lee, C.-Y. S. (2008). Likelihood of developing an alcohol and cannabis use disorder during youth: Association with recent use and age. *Drug and Alcohol Dependence*, 92(1–3), 239–247. <https://doi.org/10.1016/j.drugalcdep.2007.08.005>
- Winters, K. C., Tanner-Smith, E. E., Bresani, E. & Meyers, K. (2014). Current advances in the treatment of adolescent drug use. *Adolescent Health, Medicine and Therapeutics*, 5, 199–210. <https://doi.org/10.2147/AHMT.S48053>
- Yang, Y., Knight, K., Joe, G. W., Rowan-Szal, G. A., Lehman, W. E. & Flynn, P. M. (2013). The influence of client risks and treatment engagement on recidivism. *Journal of Offender Rehabilitation*, 52(8), 544–564. <https://doi.org/10.1080/10509674.2013.840353>