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Trauma, Alexithymia, Emotional Regulation and Dissociation in Alcohol Use  
Disorder, Substance Use Disorder and Polysubstance Disorder

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Doctorate in Clinical Psychology

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Psychology at the University of Edinburgh

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## I. DCLinPsychol Declaration of Own Work

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## **1. ABSTRACT**

**Background:** Around 33-50% who attend treatment for substance use disorder (SUD) and alcohol use disorder (AUD) have a history of trauma. Experiencing trauma can lead to psychological disorders, difficulties with emotional regulation and dissociation. SUD and AUD can be chronic, relapsing disorders and understanding what individual factors affect addiction has important implications for treatment.

**Objective:** The systematic review was interested in whether alexithymia affects abstinence after relapse prevention treatment (both psychological and pharmacological). The review was also interested in whether alexithymia is a stable trait after relapse prevention treatment (both psychological and pharmacological) as measured by the Toronto Alexithymia Scale. The research study investigates the relationships between trauma, dissociation, alexithymia, emotional regulation and SUD, AUD and polysubstance use. There has been little research looking at the relationships between these variables and how they compare in different types of substance use. It was hypothesised that patients with poly-substance addiction will have higher incidents of trauma, dissociation, alexithymia and poorer emotional regulation when compared to alcohol and drug dependence alone.

**Methods:** A systematic search of articles published between January 1989 - January 2017 was carried out following the Cochrane (2008) guidelines. PSYCHInfo, Medline and Cinahl were the key databases searched. Papers were quality assessed to identify strengths and weaknesses. The research study is a qualitative, cross-sectional design that involved ninety-one AUD, SUD and poly-substance use participants who were attending outpatient NHS addiction services. They were asked to complete questionnaires assessing trauma, dissociation, alexithymia and emotional regulation.

**Results:** The systematic review found twelve articles that related to the review questions. The systematic review found alexithymia did not impact on abstinence and there was no difference between abstinence after treatment between low and high alexithymic groups. There were mixed results for whether alexithymia score changes after relapse prevention treatment. Overall, the results suggest that alexithymia is

relatively stable across SUD and AUD after relapse prevention treatment. The empirical study found that there is no difference between type of addiction and trauma, alexithymia and emotional regulation. People with polysubstance misuse reported significantly higher levels of dissociation than the other two groups. Multiple regression was conducted on the full data set and it was found that emotional regulation, alexithymia and dissociation were able to predict trauma in alcohol, drug and polysubstance users.

**Conclusions:** The systematic review found that despite the assumption that people with alexithymia have higher rates of relapse and attrition this is not the case. Alexithymia has no impact on treatment outcome. The review also found that CBT was identified as an effective relapse prevention treatment for people with alexithymia. The research paper highlighted that the type of substance used by people who have experienced trauma may not be as important as previously thought. Also, understanding that poor emotional regulation, alexithymia and dissociation commonly co-occur with trauma so it may be important to screen for this when treating people with trauma who have co-morbid addictions.

**Keywords:** addiction, alexithymia, trauma, dissociation, emotional regulation

## **2.1 Stability of alexithymia and its impact on relapse prevention treatment in alcohol use disorder (AUD) and substance use disorder (SUD): A Systematic Review**

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Systematic Review: 7381 (excluding tables and figures); 8849 (including all tables and figures)

## 2.2 ABSTRACT

**Objective:** It is the aim of this paper to systematically review and provide a narrative synthesis on whether the presence of alexithymia in people with alcohol use disorder and substance use disorder affects relapse rates and attrition after psychosocial and pharmacological relapse prevention treatment. Also, this review will look at stability in alexithymia in people with AUD and/or SUD after detoxification or psychosocial relapse prevention treatment.

**Method:** A systematic search of Medline, PsycINFO and CINAHL published between 1989 and January 2017 was undertaken to find relevant articles. The methodological quality of the articles was assessed using Downs and Black (1998) quality assessment tool.

**Results:** Twelve studies of varying methodological quality were identified as being able to answer both questions. Alexithymia did not affect attrition and abstinence rates after psychosocial relapse prevention treatment. Alexithymia was found to have relative stability but no absolute stability in SUD and AUD after relapse prevention treatment.

**Discussion:** A lack of relationship between alexithymia and attrition and abstinence in SUD and AUD was the consistent finding of the papers reviewed. The conclusions drawn from this review are tentative that alexithymia has no absolute stability but is a relatively stable trait in SUD and AUD. The conclusion drawn should be taken with caution due to varying follow up times, varying sample sizes between papers, varying methodological quality and that only one study looked at AUD.

## 2.3 HIGHLIGHTS

- **Level of alexithymia is unrelated to attrition and abstinence in SUD and AUD**
- **Alexithymia does not have absolute stability in AUD and SUD**
- **Alexithymia has relative stability in SUD and AUD**

**Keywords:** alexithymia, alcohol use disorder, substance use disorder, abstinence.

## **2.4 INTRODUCTION**

### **2.4.1 Overview**

Alexithymia is considered a difficulty of affect regulation (Taylor, Bagby & Parker, 1997). It was first broadly defined by Sifneos (1973) as having no words for emotions and has both emotional and cognitive components. The emotional component is characterized by deficits in identifying and describing emotion, and having problems differentiating between emotion and somatic experience. The cognitive aspect of alexithymia is having an impaired ability to fantasize, an externally oriented thinking style and a reduced ability to think introspectively. Alexithymia has been identified throughout the world in different ethnic, cultural and racial groups (Parker et al, 2005; Taylor, Parker & Bagby, 2003) and is prevalent in approximately 10% of the general population (Taylor, Bagby & Parker, 1999).

Alexithymia has been identified in a range of psychological problems such as depression (Kim et al., 2008; Honkalampi et al., 2000), anxiety (Cox, Swinson, Shulman & Bourdeau, 1995) schizophrenia and eating disorders (Cochrane, Brewerton, Wilson & Hodges, 1993). It has also been associated with increased suicidality (Hintikka et al., 2004), heightened psychosomatic conditions (Lane, 2008) and even elevated mortality rates (Tolmunen et al., 2010). Prevalence of alexithymia in alcohol use disorders (AUD) ranges between 45-67% (Thorberg et al., 2009) which is considerably higher than the general population and other psychological problems (Saarijärvi, Salminen & Toikka, 2006; Marchesi, 2015). In alcohol use disorders and substance use disorders (SUD) alexithymia is associated with further risk factors such as higher levels of negative emotion and more troubling somatic symptoms such pain and fatigue (de Sousa et al., 2010).

### **2.4.2 Development of alexithymia in Addiction**

Demers et al. (2015) have proposed that disruption in normal neurodevelopmental processes caused by childhood trauma and neglect results in the development of alexithymia. Other studies have also found that psychiatric outpatients with PTSD who reported abuse and neglect in childhood were more likely to have alexithymia. This was

even when compared to other types of traumatic events (Zlotnick, Mattia & Zimmerman, 2001; Spitzer et al., 2007). This has also been replicated in patients with severe depression who have experienced childhood trauma (Paivio & McCulloch, 2004). Childhood abuse has been shown to predict problems with emotional awareness, emotional regulation and difficulties in expression of feelings (Taylor, Parker & Bagby, 1997). Early trauma can impact attachment relationships especially when the traumatic experience is perpetrated by the main caregiver (Briere, 1992). Children who develop insecure attachment relationships with their caregivers have difficulties with cognitive and emotional processing (Knox, 2003). Thorberg et al. (2011) examined attachment relationships and alexithymia in an AUD population to understand the role attachment and early trauma has in this population. They found that alexithymic people with AUD reported higher levels of childhood trauma and higher levels of anxious attachment than non alexithymic AUD participants.

Substance and alcohol addiction are chronic and relapsing conditions and a large proportion of individuals who have been treated for addiction tend to relapse shortly after treatment (Walton, Blow, Bingham & Chermack, 2003; Xie, McHugo, Fox & Drake, 2005). People with AUD and alexithymia report a stronger desire to drink, tend to drink more often and in larger quantities than a similar population without alexithymia (Thorberg et al., 2011; Lyyers, Onuona, Thorberg & Samios, 2012). It has been proposed that having alexithymia could be a risk factor in developing AUD (Thorberg et al., 2011). It may be that people use substances to regulate their emotions and block negative feelings (Somer, 2003). Similar findings were found for people with SUD and concurrent high levels of alexithymia (e.g. Hamidi et al., 2010; Carton, et al., 2010.). It may be that one of the mechanisms in the development of alexithymia is the experience of early trauma which results in difficulties with emotional processing (Taylor, Bagby & Parker, 1997).

### **2.4.3 Measurement of Alexithymia**

The Toronto Alexithymia Scale (the TAS-20) is the most widely used and studied measure of alexithymia (Bagby, Parker & Taylor, 1994; Cleland et al., 2005). The TAS-20 has

three subscales measuring difficulties in identifying feelings (DIF), difficulty describing feelings (DDF) and externally orientated thinking (EOT) (Taylor, Parker & Bagby, 2003). Marchesi, Ossola, Tonna & Panfilis (2014) investigated what the TAS-20 measured when assessing alexithymia and looked at a range of psychological disorders including SUD. They concluded that scores on the TAS-20 may be inflated if the patient has high levels of distress and that the TAS-20 is a measure of distress rather than alexithymia. Cleland et al. (2005) looked at the suitability of the TAS-20 as a measure of alexithymia in SUD and AUD. They found that the majority of the questions accurately measured alexithymia in this population group. Therefore, there are some mixed findings on how alexithymia is measured in people with alcohol and drug addiction.

#### **2.4.4 Stability of Alexithymia**

Parker, Taylor & Bagby (2001) have proposed that there may be two different ways of conceptualising alexithymia. The first is that alexithymia is a trait, an enduring personality characteristic that does not alter over time. The second is that alexithymia is a state which is evoked during times of stress. This is often described in the literature as absolute and relative stability. Absolute stability is the extent to which scores on a measure of alexithymia change over time. In contrast, relative stability is the level of which relative differences between individuals remain the same over time. Luminet, Bagby & Parker (2001) examined the absolute and relative stability of alexithymia in people with depression. They found that alexithymia scores as measured by the TAS-20 changed significantly in the three months from baseline to follow-up which suggests that alexithymia does not have absolute stability in this group. However, scores at baseline correlated with scores at follow-up suggesting that alexithymia has relative stability. From this study, they concluded that alexithymia is a stable personality trait and not a state dependent occurrence. There has been uncertainty in the addiction literature as to whether alexithymia is a trait or a state. For example, the high prevalence rates (45-67% found by Thorberg et al., 2009) have also been observed in patients that are abstinent (Taylor, Graeme, Bagby & Parker, 1997). Therefore, having an understanding whether alexithymia is state dependent and will reduce or is a stable personality characteristic may be an important consideration when treating addiction.

#### **2.4.5 Relapse Prevention Treatment in SUD and AUD**

It has been found that alexithymia is linked with severity of psychological distress and treatment outcome (Samur et al., 2013; Ogrodniczuk, Piper & Joyce, 2011). Ogrodniczuk, Piper & Joyce (2011) conducted a review on how alexithymia affects the process and outcome of psychological therapy. They found that people with alexithymia have poorer outcomes and higher attrition with psychodynamic psychotherapy and therapists had a more negative reaction to these patients. This may be in part due to the difficulty people with alexithymia have with describing their emotions. Typical treatment of alcohol and substance misuse disorders involves the medical management of detoxification and psychosocial treatments for relapse prevention. NICE guidelines (2007; 2011) recommend that the most effective psychosocial treatments for maintaining abstinence are individual or group Cognitive Behavioural Therapy (CBT), motivational interviewing (MI), community reinforcement and mutual self-help groups including Alcoholics Anonymous (AA) or Narcotics Anonymous (NA).

#### **2.4.6 Purpose of Review**

Thorberg et al. (2009) conducted a review into alexithymia and alcohol addiction. They found that alexithymia and alcohol addiction were positively associated with dependence severity, level of alcohol consumption and poor interpersonal relationships. Thorberg et al.'s (2009) critical review in this area was a valuable summary of research on alexithymia and alcohol addiction. However, this was not a systematic review and the quality of evidence reviewed was not assessed. Also, to date there has been no review on the impact of alexithymia on attrition and relapse or the stability of alexithymia following AUD and SUD treatment. Ogrodniczuk, Piper and Joyce (2011) found that having alexithymia had a negative effect on therapeutic outcome following psychological therapy and that a poorer therapeutic alliance was developed. Recent research has conceptualised alexithymia as a consequence of early life trauma and disrupted attachment. This review will add to understanding about how emotional regulation problems such as alexithymia impact on treatment outcomes in a difficult to treat population. Therefore, reviewing whether having alexithymia increases the rates of attrition and relapse in AUD and SUD populations has clinical utility. Also, reviewing the available literature to determine

whether alexithymia is a state or a trait adds to understanding about whether alexithymia is a stable personality construct in people with alcohol and drug addictions.

It is the aim to systematically review and provide a narrative synthesis of whether the presence of alexithymia in people with alcohol use disorder and substance use disorder affects relapse rates and attrition after psychosocial and pharmacological relapse prevention treatment. Also, this review will look at stability in alexithymia in people with AUD and/or SUD after detoxification or psychosocial relapse prevention treatment in order to investigate whether alexithymia is an absolute or relatively stable construct.

## **2.5 METHOD**

### **2.5.1 Protocol and Registration**

This systematic review was registered on PROSPERO [www.crd.york.ac.uk](http://www.crd.york.ac.uk). Registration number: 42017054574.

### **2.5.2 Literature Search Strategy**

A literature search was carried out using three electronic databases: Medline [1989-January 2017], PsycINFO [1989- January 2017], CINAHL [1989 - January 2017]. The search was started at 1989 as this was the earliest starting point for the data bases. The search also included verifying that no other similar reviews had been carried out. The search terms used related to a population that had an ‘alcohol use disorder’ (AUD) or “substance use disorder” (SUD) and were combined using ‘AND’ with terms linked to ‘alexithymia’. Each key word inclusion was checked for each database to ensure all the areas of focus were included. This meant that key words used for the search were “alexithymia” and “alcohol use”, “alcohol use disorder”, “alcoholism”, “substance use disorder”, “addiction”, “relapse” or “alcohol”. Searches were confined to the title, abstract and keywords. Searches were also carried out in reference lists of all articles that were eligible, as well as a search for citations of each of these articles. This enabled articles that may have been published earlier than 1989 to be searched.

### **2.5.3 Eligibility Criteria**

Studies were included if: 1) articles were published in English and in a peer reviewed journal; 2) papers included individuals with AUD or SUD who were over the age of 16; 3) the primary research aim was to evaluate change in alexithymia levels after relapse prevention treatment (either pharmacological or psychosocial) or that investigated the effect of alexithymia on abstinence after relapse prevention treatment (either pharmacological or psychosocial). Group or individual CBT, MI, community reinforcement or mutual support groups were considered to be appropriate psychosocial relapse prevention treatments as these are the recommended treatments with the most robust evidence based for efficacy (NICE, 2007; 2011).

### **2.5.4 Exclusion Criteria**

Studies were excluded if: (1) they did not use quantitative data, using only descriptive reports or having a theoretical focus (2) did not use a valid measure of alexithymia (3) they were case studies.

### **2.5.5 Selection of Articles**

The literature search process is detailed in Figure 1. The initial search, using the previously mentioned search strategy, produced 483 articles. After duplicates were removed this reduced to 221 articles. The titles and abstracts of these articles were read to determine if they were appropriate for inclusion. This excluded a further 184 papers, leaving 37 papers to review in more detail. A further 27 papers did not meet inclusion criteria so the remaining 10 articles were included in this review. The references of these 10 papers were also searched for possible articles that were not included in the original database search. From this a further 2 were identified as papers for inclusion; therefore, 12 papers were included in this systematic review. This is summarized in Figure 1. The twelve papers that met inclusion criteria were reviewed in detail. Summary information from each article was identified and presented in Table 1. This included sample numbers and characteristics, relapse prevention intervention (duration, type and follow-up),

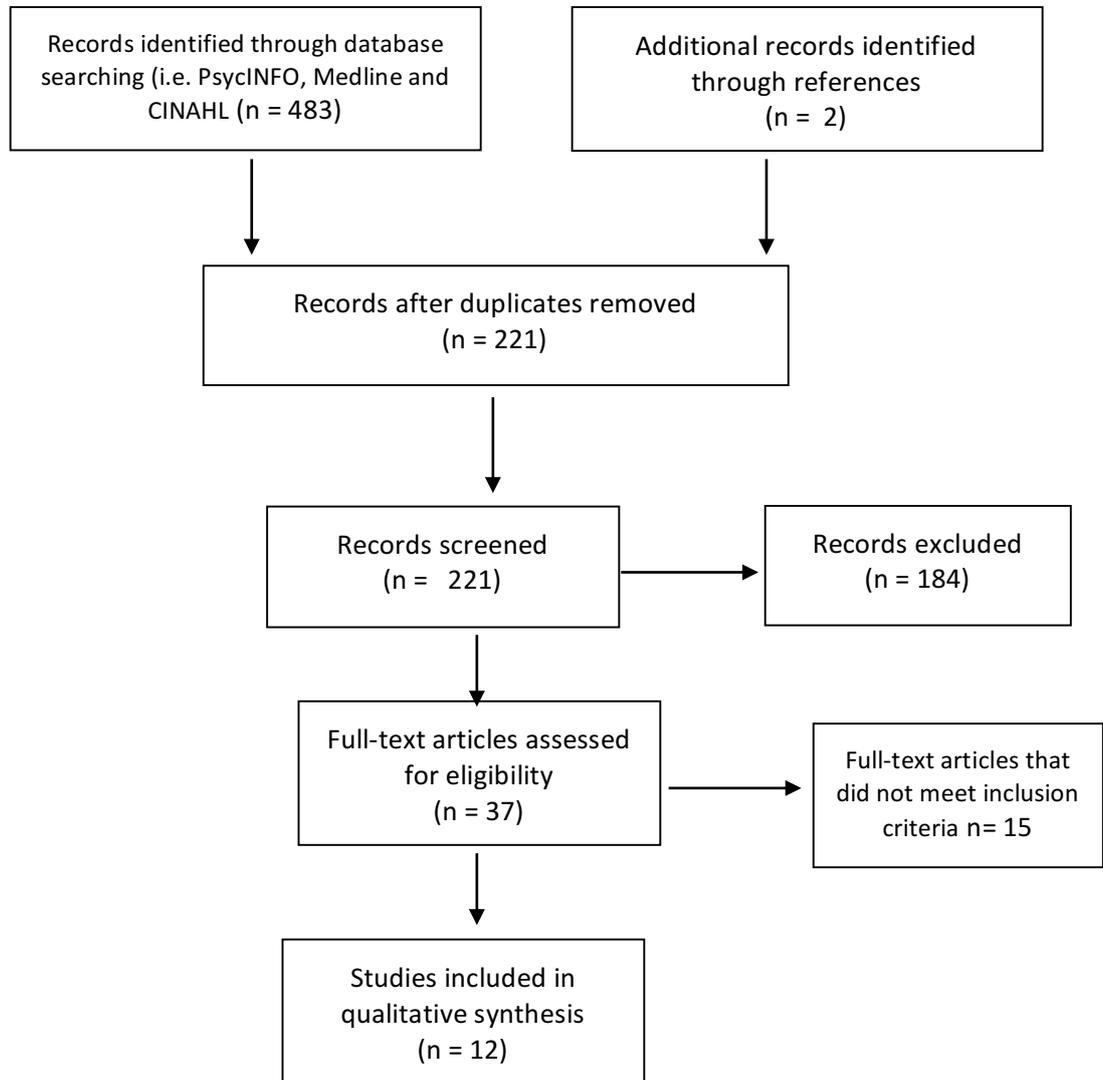
alexithymia assessment, results and outcome. It should be noted that two papers used data from the same study.

### **2.5.6 Assessment of Quality of Included Studies**

The quality of the included studies was assessed to determine how much weight should be given to the results of each paper. The quality criteria used to assess the chosen studies was a shortened version of Downs and Black (1998) quality assessment tool. The reason for amending the tool was to remove questions that were not relevant to the types of studies that were reviewed in order to not unfairly disadvantage them (e.g. questions more suited to RCTs). Downs and Black (1998) has been found to have good test-retest reliability ( $r=0.88$ ) and good inter-rater reliability ( $r=0.75$ ). The tool has been recommended as a reliable tool to assess methodological quality (Deeks et al., 2003).

The reviewer rated each paper against the Downs and Black criteria. In order to check the validity of the reviewer's scoring decisions SIGN (2008) recommends that the quality assessment should also be undertaken by a second researcher to ensure consistency. A doctoral level student was asked to review 50% of the papers. There was good agreement between the two raters' judgements (89%). Discussions took place to identify the appropriate rating for the criteria where agreement was not reached.

**Figure 1:** Flow chart of included articles based on Prisma guidelines (Moher et al., 2009)



## **2.6 RESULTS**

### **2.6.1 Description of Included Studies**

Overall, there were 1293 participants with SUD or AUD included in this review over the twelve studies. De Haan et al. (2012a) and De Haan et al. (2012b) used the same group of participants for their research so their participant numbers have only been included once in the overall total. Table 1 has a summary of the papers reviewed.

All studies used the TAS-20 (Bagby, Taylor & Parker, 1994). One study Loas et al. (2007) used the Beth-Israel Questionnaire (BIQ; Sifneos, 1973) to initially screen participants into high and low alexithymic groups.

All studies used the DSM-IV (1994) as their criteria for making a diagnosis of alcohol or substance use disorder. Some studies identified that this diagnosis had been made by the researchers by clinical interview or it was stated that meeting diagnostic criteria was part of the inclusion criteria for the study.

### **2.6.2 Quality of included studies**

The quality ratings for the twelve studies as assessed by twenty-one quality criteria questions from Downs and Black (1998) are presented below in Table 2. It is important to note that this is not a comparative measure but an indication of the studies' methodological strengths and weaknesses. From this Stasiewicz et al. (2012), De Haan et al. (2014) and De Haan et al. (2012a) had the strongest methodological studies. The other studies included had variable methodological strength. It should be noted that none of the studies reported power calculations, however, the majority of the studies had large sample sizes.

### **2.6.3 Does alexithymia influence treatment outcomes after relapse prevention treatment?**

#### *Psychosocial Relapse Prevention Interventions*

Eight of the studies included in this review looked at the influence of alexithymia on relapse after treatment. Some of these studies also looked at whether alexithymia affected attrition rate. Rosenblum et al. (2005) looked at participants with SUD and separated them into two relapse prevention treatment groups of group based CBT where participants were taught relapse prevention strategies. This was a manualized

approach to ensure consistency. The second intervention was similar to the first but included the addition of motivational enhancement. Again, this was a manualized approach to ensure consistency and fidelity. As both treatments are evidence based an aim of the study was interested in whether alexithymia influences rates of abstinence. They found that there was no significant difference between alexithymia, intervention strategy and days abstinent (Cohen's  $d= 0.03$ ). They found that poor attendance was unrelated to alexithymia and was significantly related to severity of alcohol use. A strength of the study was that they used urine and hair analysis to test for abstinence as well as self-report. However, participants attended only 50% of the intervention and the reasons why were not explored. Also, the participants self-referred and received financial reward so they may not be representative of most SUD patients. The follow-up time after intervention was 15 weeks and this is a short-time period for assessment for relapse. It may be that if the follow-up period as longer relapse rates may have been different. Overall, the Rosenblum et al. (2005) study scored highly against the quality criteria, was well-designed, had a large sample size and a robust measure of abstinence.

An early study of alexithymia and treatment outcomes was conducted by Keller et al. (1995). They randomized 121 people with SUD, AUD or polysubstance use into three treatment arms investigating CBT, pharmacotherapy and supportive clinical management. The study scored well for methodological design, they controlled for anxiety and depression and concluded that there was no significant difference in treatment retention (Cohen's  $d= 0.01$ ) or in abstinence rates between people with or without alexithymia (Cohen's  $d= 0$ ). The interventions lasted a minimum of 2 sessions and participants were followed up at 12 weeks. The number of intervention sessions was unclear as it appeared some participants received more input than others which makes it difficult to compare across conditions. To measure abstinence, they tested urine and took self-reports from participants. In terms of intervention, people with alexithymia had more days abstinent when they received supportive management which is not consistent with the other studies in this review who have identified that CBT based interventions produced the most days abstinent. The study did not investigate whether SUD, AUD or polysubstance influenced treatment outcomes or alexithymia scores.

Table 1: Summary of review articles

Study	Sample	Alexithymia assessment	Intervention approach	Duration of Intervention	Duration of follow up	Results
1.Morie et al. (2015)	Met DSM-IV criteria for SUD Men and women N= 73	TAS-20 Baseline, post-treatment, 1 month, 2 months, 6 months	1. TAU (methadone maintained) 2. TAU + CCBT	8 weeks	1 month; 2 months and 6 months (83% followed-up)	No significant difference in TAS-20 scores between baseline and follow-up. High levels of alexithymia had no impact on attrition. Higher alexithymia scorers had more days abstinent and longer periods of consecutive abstinence in TAU + CCBT when compared to TAU
2. Timary et al. (2008)	Met DSM-IV criteria for AUD Men and women N = 70	TAS-20 Baseline, 2 days, 2 weeks	Inpatient detox pharmacological treatment: benzodiazepine	2 weeks	2 days; 2 weeks	Decrease in DIF subscale, no change in DDF and EOT subscales. When depression and anxiety are partialled out alexithymia is relatively stable and a trait in AUD.
3.Rosenblum et al. (2005)	Met DSM-IV criteria for SUD and AUD Men and women N = 230	TAS-20 Baseline	1. Group CBT N = 114 2. Group CBT with MI = 116	20 sessions planned; average attendance 9 sessions	15 weeks 1. 81.9% followed up 2. 79.8% followed up	No post-treatment TAS-20 scores measured so unable to review score changes High alexithymics responded well to CBT compared with CBT + MI and had more days abstinent in both AUD and SUD

4. Thorberg et al. (2016)	Met DSM-IV criteria for AUD Men and women N = 92	TAS-20 Baseline, follow-up	CBT	8 sessions	3 months (100% followed-up)	Scores remained relatively stable and study concluded alexithymia has relative stability and is a trait in AUD. Study did not assess abstinence following treatment
5. de Haan et al. (2014)	Met DSM-IV criteria for SUD Men and women N = 131	TAS-20 Baseline, post-treatment	Inpatient detox pharmacological treatment: benzodiazepine and methadone treatment	3 weeks	3 weeks (77% followed-up)	High relative stability for total TAS-20 score and DDF and DIF subscale. EOT had moderate relative stability.
6. de Haan et al. (2012a)	Met DSM-IV criteria for SUD Men and Women N = 187	TAS-20 Baseline, follow-up	1. Group CBT 2. Group CBT + SDMI	3 months	3 months (81.3%)	Alexithymia scores change from baseline to post-treatment. High alexithymia patients at baseline scored lower at follow-up. The results also revealed differences in relative stability between all patients with SUD. Findings argue against alexithymia as a stable personality trait
7. de Haan et al. (2012b)	Met DSM-IV criteria for SUD Men and Women N = 187	TAS-20 Baseline	1. Group CBT N 2. Group CBT + SDMI	3 months	3 months (81.3% followed up)	No post-treatment TAS-20 scores measured so unable to review score changes. High alexithymia scores had no impact on abstinence or attrition

8.Kopera et al. (2014)	Met DSM-IV criteria for AUD Men and women N = 80	TAS-20 Baseline	Individual and group CBT	8 weeks	1 year 88% of patients followed up	No significant relationship between alexithymia and relapse.
9. Loas et al. (1997)	Met DSM-III criteria for AUD Men and women N = 46	BIQ; TAS-20 Baseline,	Inpatient treatment, detox	Not stated	15 months (100% followed-up)	Higher scores on TAS-20 were correlated with relapse, no change in TAS-20 scores reported at follow-up
10. Keller et al. (1995)	Met DSM-III criteria for SUD Men and women N = 93	TAS-20 Baseline	1. CBT 2. Clinical management (supportive therapeutic relationship, medication management) 3. Pharmacotherapy	2 session minima	3 months (77% follow up)	High levels of alexithymia had no impact on attrition or abstinence. Alexithymics had longer periods of abstinence with clinical management
11. Cleland et al. (2005)	Met DSM-IV criteria for AUD or SUD N=220	TAS-20 Baseline	1.Group CBT 2.Group CBT + MI	10 weeks	15 weeks (78%)	Alexithymia affects attrition in SUD. There is no significant difference in SUD and poly SUD but high alexithymia in SUD has poorer treatment outcomes
12. Staciewisc et al. (2012)	Met DSM-IV criteria for AUD Men and women N = 71	TAS-20 Baseline	1. CBT + affect regulation 2. CBT + healthy lifestyle information	3 months	3 months (74.6%)	High levels of alexithymia were unrelated to abstinence. Change in alexithymia scores after treatment not measured.

TAU- Treatment as usual

Table 2: Scored papers using Down and Black (1998) criteria

	Morie et al. (2015).	Timary et al. (2008).	Roseblum et al. (2005)	Thorberg et al. (2016)	De Haan et al. (2014)	De Haan et al. (2012a)	De Haan et al. (2012b)	Kopera et al. (2014)	Loas et al. (1997)	Keller et al. (1995)	Cleland et al. (2005)	Stasiewisc et al (2012)
1. Is the hypothesis/aim/objective of the study clearly described?	1	1	1	1	1	1	1	1	1	1	1	1
2. Are the main outcomes to be measured clearly described in the Introduction or Methods section?	1	1	1	1	1	1	1	1	1	1	1	1
3. Are the characteristics of the patients included in the study clearly described?	1	1	1	1	1	1	1	1	0	1	1	1
4. Are the interventions of interest clearly described?	1	0	1	1	1	1	1	1	0	1	1	1
5. Are the distributions of principal confounders in each group of subjects to be compared clearly described?	1	0	1	2	2	1	2	2	0	2	2	2
6. Are the main findings of the study clearly reported?	0	1	1	1	1	1	1	1	1	1	1	1
7. Does the study provide estimates of the random variability in the data for the main outcomes?	1	1	1	1	1	1	1	1	1	1	1	1
8. Have the characteristics of patients lost to follow-up been described?	0	0	0	1	1	1	1	1	1	0	1	1

9. Have actual probability values been reported	1	0	1	1	1	1	1	1	1	0	0	0
10. Were the subjects who were asked to participate in the study representative of the entire population from which they were recruited?	0	0	1	0	1	1	1	0	0	1	1	0
11. Were those subjects who were prepared to participate representative of the entire population from which they were recruited?	0	0	1	1	1	1	0	0	0	1	0	1
12. Were the places and facilities where the patients were treated or recruited from representative of the treatment the majority of AUD and SUD patients	0	1	1	0	1	1	1	1	1	1	1	1
13. If any of the results of the study were based on "data dredging", was this made clear?	1	1	1	1	1	1	1	1	1	1	1	1
14. In trials and cohort studies, do the analyses adjust for different lengths of follow-up of patients	1	1	1	1	1	1	1	1	0	1	1	1
15. Were the statistical tests used to assess the main outcomes appropriate?	1	1	1	1	1	1	1	1	1	1	1	1
16. Was compliance with the interventions reliable?	1	1	1	1	1	1	0	0	0	1	1	1
17a Were the main outcome measures used for ALEXITHYMIA	1	1	1	0	1	1	0	1	0	1	1	1

accurate (valid and reliable)?												
17b. Were the main outcome measures used for SUD or AUD accurate (valid and reliable)?	1	1	1	1	1	1	0	1	1	1	1	1
18. Were the patients in different intervention groups recruited from the same population?	1	0	1	1	0	1	0	0	0	1	1	1
19. Was there adequate adjustment for confounding in the analyses from which the main findings were drawn?	1	1	1	1	1	1	1	1	0	0	1	0
20. Were losses of patients to follow-up considered?	0	0	0	1	1	1	1	1	1	0	1	1
21. Did study report that it had sufficient power	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL SCORE</b>	15/23	13/23	19/23	19/23	21/23	21/23	17/23	18/23	11/23	18/23	20/23	21/23

De Haan (2012b) looked at whether alexithymia, as measured by the TAS-20, affects abstinence after relapse prevention treatment. Alexithymia was an independent variable used to determine whether it affected treatment efficacy. Alexithymia was assessed at baseline which was defined as a period of one month of controlled abstinence. The data from this study was taken from a larger trial examining the efficacy of group CBT and group CBT with an added shared decision making intervention for AUD. However, in this paper the interventions were not described and what the shared decision making element was not adequately explained. Participants were screened for Axis I disorders but only if their mental health was unstable were they excluded in the study. This means participants were more representative of people who usually attend addiction services. They measured alexithymia using the TAS-20 and found that alexithymia was unrelated to attrition. Around 53% of people with high levels of alexithymia were abstinent in the past 30 days at one-year follow-up which was not significantly different from people who were not alexithymic. By comparing the groups of low alexithymics and high alexithymics they found there was no significant difference between them (Cohen's  $d=0.2$ ). The study looked at both people who misused alcohol alone and people with polysubstance misuse. Having alexithymia did not make a significant difference in relapse rates across single or polysubstance misuse. De Haan and his colleagues found that baseline levels of alexithymia were unrelated to abstinence at follow-up. A key strength of the study is that the follow-up is a year post treatment and that the authors were able to follow-up 93% of the cohort. Overall, despite some limitations the study scored highly using the quality criteria for methodological strength.

Cleland et al. (2005) principal focus was to investigate the psychometric properties of the TAS-20 in SUD. However, they also measured whether having alexithymia had any bearing on abstinence after group based CBT psychoeducation relapse prevention treatment. Participants with SUD, AUD or both were not excluded if they have mental illness. Participants ( $n=114$ ) were randomly assigned to a 10-week group delivered psychoeducational CBT and 116 participants to group delivered psychoeducational CBT with an additional motivational interviewing component. The data from both groups was pooled for the analysis looking at abstinence so the study was unable to determine whether

type of relapse prevention treatment influenced abstinence and attrition. They found that participants with higher levels of alexithymia attended fewer sessions of treatment and had poorer engagement as measured on the Helping Alliance Questionnaire. Correlations between levels of alexithymia and sessions attended showed there was a small negative effect size indicating that having alexithymia indicates poorer attendance in relapse prevention treatment (Cohen's  $d = -0.2$ ). They also found that alexithymic participants who misused alcohol at baseline were less likely to be abstinent at follow-up although the effect size was small (Cohen's  $d = 0.31$ ). However, they found there was no significant difference for alexithymic SUD and polysubstance users and abstinence at follow-up compared to non alexithymic participants (Cohen's  $d = 0.02$ ). Unlike other studies, this paper specifically investigated whether different types of substance misuse and alexithymia affected abstinence. Pooling together the participants for analysis has made it impossible to ascertain whether type of relapse prevention treatment mediates the relationship between alexithymia and attrition. This study did not report whether they had enough participants for power or actual probability values for their analysis.

Morie et al. (2015) investigated a novel approach to relapse prevention in cocaine addiction and the efficacy of computer-based cognitive behavioural therapy. The data from the paper came from a larger study investigating the use of computerized CBT in addictions. There were 101 participants in the study who were maintained on methadone before the study began as is the usual pharmacological intervention. The study had five assessment points in which 73 participants were followed-up: pre, post, one month, two months and six months follow up and the TAS-20 was administered at each point. Participants were randomized while controlling for gender, severity of addiction and education into CCBT and treatment as usual which was mutual support groups. Alexithymia in this study was assessed to determine whether it affects the efficacy of the intervention. They found there was no relationship between alexithymia and attrition rate as assessed using T-tests. No significant difference was found between people with alexithymia and those who do not in the treatment condition. The reporting of the results was poor and they did not report means or standard deviations for each group. Therefore, interpreting the size of the effect was not possible with the data included in the paper.

They concluded that alexithymia did not impact negatively on abstinence after treatment and there was no significant difference between self-report cocaine use and urinalysis in alexithymics and non-alexithymics. Participants with high levels of alexithymia found the most benefit from CCBT and had more days abstinent in this condition. However, participants lost to follow-up were not described and whether participants were representative of the entire population was not reported.

Kopera et al. (2014) looked at how relapse in AUD was related to emotional processing. The sample was 80 AUD participants who were inpatients in an alcohol rehabilitation centre. Participants completed a TAS-20 at the beginning of treatment only and 90% were followed up one year later and the completed the TAS-20 again and a completed a self-report interview around whether or not they had been drinking in the last 30 days. The relapse prevention treatment was a combination of both individual and group therapy over 8 weeks in an inpatient setting. The content of the intervention was not adequately described. The authors report that some elements of the 12 step programme and relapse prevention was included but overall what treatment the participants received was unclear. Kopera et al. compared participants with high and low levels of alexithymia and found no difference between those who stayed abstinent and those who relapsed. Using T-tests to compare alexithymia scores on the TAS-20 between abstinent and non-abstinent participants they found that there was no significant difference between groups (Cohen's  $d = 0.05$ ). Therefore, they found that alexithymia does not affect abstinence rates in AUD after relapse prevention treatment. However, these findings must be treated with some caution. The amount of sessions and the content of the intervention was not clearly described and also whether each participant received the same length of treatment. The participants included in the study were assessed and excluded if they had any co-morbid Axis I diagnosis. This controlled for the confounding variables of depression and anxiety as Leising, Grande & Faber (2009) reported that this overinflates scores on the TAS-20. However, excluding participants with mental health problems is not representative of the usual people who present to addiction services with estimates of co-morbid Axis I disorders at 50-60% (Conway, Brewerton, Wilson & Hodges, 2006). Abstinence was measured at one year follow-up by either self-report or family report. Although there was

a 1 year follow-up it was only abstinence in the last 30 days that was assessed. This may give an unreliable picture of abstinence during the year between intervention and follow-up. Also, it was not discussed whether participants had had other relapse prevention treatment in the intervening year.

The final study that looked at psychosocial relapse prevention treatments was Stasiewicz et al. (2012) who examined alexithymia within an AUD population. They randomized 71 participants into two groups. The first was group-based CBT with affect regulation strategies and the second was group-based CBT with health and lifestyle psychoeducation. One of the study's key objectives was to investigate the relationship between alexithymia and treatment outcomes after a relapse prevention intervention. The authors defined attrition as not attending the 3-month follow-up appointment and attending less than 50% of the intervention sessions. After controlling for alcohol severity, anxiety and depression, they found that following logistic regression analysis there was no significant effect of alexithymia on attrition (Cohen's  $d=0$ ). Therefore, they found that alexithymia was unrelated to treatment drop-out both during treatment and failure to attend follow-up. Elevated alexithymia scores were significantly associated with severity of alcohol dependence. However, higher scores on the TAS-20 were not significantly correlated with amount of alcohol consumed or number of days drinking post treatment (Cohen's  $d=0.02$ ). Therefore, alexithymia does not influence attrition or abstinence. The study scored highly against the quality criteria and although the sample size was relatively small their findings should be included in understanding the role of alexithymia in maintaining abstinence after treatment.

#### *Pharmacological Relapse Prevention Intervention*

Loas et al. (1997) examined whether alexithymia was a negative influence on abstinence after relapse prevention treatment. The study used participants from an inpatient psychiatric hospital who were undergoing treatment for alcohol dependence. They initially separated the 47 participants into two groups of alexithymics and non-alexithymics based on scores on the Beth Israel Questionnaire (Sifneos, 1973). Both groups then completed that TAS-20. The participants were followed up after 15 months

to examine whether participants with alexithymia had fewer days abstinent. The reasons for using two measures of alexithymia were unclear and also why both groups then subsequently completed the TAS-20. They used TAS-20 scores as a categorical variable when comparing abstinence rates rather than as a continuous variable as the other studies in this review have done. Parker, Keefer, Taylor & Bagby (2008) have advised to treat alexithymia as a continuous variable as small fluctuations in score can result in change in category and make it appear that change is significant when it is not. They compared the alexithymic and non alexithymic groups using T-tests and found that the demographics of the groups did not differ but that the proportion of people abstinent at follow up was higher in the non-alexithymic group. Unfortunately, exact p values were not reported but they stated that there was a significant difference between groups. When effect size was calculated using the data presented in the paper this was a large, adverse effect size (Cohens  $d=-1.04$ ) indicating that people with alexithymia were significantly more likely to relapse than people without alexithymia. Abstinence was decided by the participants' psychiatrist and was recorded as abstinent at time of follow-up. The study did not examine number of days abstinent in the year since intervention and follow up but who was abstinent on the day of follow up. The method of assessing abstinence may not have been reliable and not considering the total time abstinent was a weakness in the study. The pharmacological relapse prevention intervention was poorly described and the sample size relatively small. Due to the significant limitations of the study the strength of their results is limited.

#### **2.6.4 Stability of alexithymia following relapse prevention treatment**

De Haan et al. (2012a) devised a methodologically rigorous study that evaluated changes in alexithymia in a randomized trial (previously described above in De Haan et al., 2012b) There were 187 participants across the groups and TAS-20 scores were taken at baseline and at three-month follow-up when the relapse prevention treatment was completed. Total TAS-20 scores were available for 140 people (75% follow-up). Total TAS-20, DDF and DIF scores were reduced significantly between baseline and follow-up (Cohen's  $d= 0.19$ ) suggesting no absolute stability of alexithymia. The assessed relative stability by using correlations between total TAS-20 score from initial baseline measurement to 3 month

follow up. They found that scores were highly correlated with a large effect size (Cohen's  $d= 0.82$ ). Therefore, they concluded that alexithymia has no absolute stability in a SUD sample but it has relative stability. They also found that reduction in alexithymia scores were not related to length of treatment condition or type of intervention. Although the study was well-designed, the relatively short follow up time for assessing change in alexithymia should be considered when drawing conclusions about absolute and relative stability. It may be that a longer follow- up time is needed proceeding intervention to assess whether changes in alexithymia have a consistent course.

Another study by the same group of authors looked at whether alexithymia was a state or trait (De Haan et al., 2014). They assessed 101 inpatients undergoing medical detox from SUD with the TAS-20 at baseline and three-week follow-up. Alexithymia was measured as a dependent variable to assess any change between pre and post intervention. Effects of withdrawal and Axis II disorders were controlled for. The study found that reductions in scores pre and post treatment meant that alexithymia is not absolutely stable and can change over time. They also found that scores had a strong regression to the mean i.e. low scores increased and high scores decreased. DeHaan et al (2014) also found relative stability with total TAS-20 scores. Overall, there was a small effect for change in overall TAS-20 scores ( $d=0.16$ ). This would suggest that although the pre and post results on the TAS-20 are correlated with each other, suggesting relative stability, the effect size for this is small and conclusions drawn for this should be interpreted with caution. It should also be noted that participants had misused a range of different drug types and also used alcohol so it is difficult to determine whether change in stability could be related to type of substance used. They concluded that alexithymia is both a personality trait and a state influenced by depression and anxiety. Both studies conducted by the same research teams found mixed results. Although both found no absolute stability there was some disagreements about how much relative stability alexithymia has in SUD.

Thorberg et al. (2016) looked at the absolute and relative stability in AUD after CBT as relapse prevention treatment. They started with a sample size of 355 however, only 92 people completed the CBT programme. The reason for this high level of attrition was not

discussed but analysis showed no differences between completers and non-completers. The people who did complete were self-referred suggesting a high level of motivation and readiness to change which may not be representative of the entire population. Participants completed the TAS-20 at baseline and at three-month follow-up. Participants completed 8 sessions of group CBT emphasizing relapse prevention and were abstinent throughout treatment. This reduced the likelihood of the psychological effects of detox inflating scores on measures of mood and alexithymia. They found that alexithymia did not have absolute stability and that there were significant differences in overall TAS-20 scores pre and post relapse prevention treatment (Cohens  $d = 1.57$ ). However, they found that there were significant moderate correlations across the time points for TAS-20 total score (Cohen's  $d = 0.5$ ). Therefore, the study concluded that alexithymia had relative stability and is a trait with AUD participants. The length of follow-up was longer than some of the others and only one type of addiction was looked at to control for the possible differences in types of substance use in alexithymia score. Overall, Thorberg et al. study design was adequate but scored lower on the quality criteria for poor reporting of the reliability of their measures and failing to report if the study had sufficient power.

Timary, Luts, Hers & Luminet (2008) examined the absolute and relative stability of AUD patients undergoing medical detox in an inpatient hospital. The 65 participants completed the TAS-20 at admission, day two and two-week follow-up. They reported that from the first time point to the third time point (2 week follow-up) there were significant changes in score suggesting no absolute stability. However, they reported that this was small effect size (Cohens  $d < 0.4$ ). Therefore, after accounting for levels of depression and anxiety they found that overall levels of alexithymia decreased significantly pre and post relapse prevention treatment indicating that alexithymia does not have absolute stability. However, there was highly significant positive correlation between pre and post TAS-20 scores with a large effect size (Cohens  $d = 0.8$ ) suggesting relative stability. This supports the view that alexithymia is a stable personality trait and not state dependent. However, the results should be interpreted with some caution. The sample size was relatively small and duration of follow-up was only two weeks. Also, there was a follow-up two days into medical detox and the effects of withdrawal symptoms on test scores was not considered.

Morie et al. (2015) study has been explained in detail above. In addition to whether alexithymia affects treatment they examined stability of alexithymia over time and after a relapse prevention intervention. At six-month follow-up 61 participants completed the TAS-20. They found no significant effect of time or treatment condition. They reported that people identified with alexithymia pre intervention still scored as having alexithymia post intervention. This study did not consider absolute and relative stability but just change in category. The study reported no significant change between pre and post scores (Cohen's  $d = 0.03$ ). In comparison to other studies looking at stability this study has the longest follow-up time and participants were methadone maintained therefore there was no effect of detox on scores. Also, participants included were addicted to cocaine creating a somewhat homogenous sample. Again, the other studies have investigated heterogeneous groups of substance misusers which may have influenced the conclusions drawn.

## **2.7 DISCUSSION**

### *Summary of Findings*

Eight studies were reviewed to address the question whether alexithymia influences outcomes in treatment seeking AUD and/or SUD after relapse prevention treatment. Six of the studies reported that alexithymia does not affect abstinence rates or attrition from treatment. The other two studies did not report this. Seven of the studies examined psychosocial relapse prevention treatments with all of them including some form of CBT. Of those studies, apart from Morie et al. (2015), the interventions were group based. Only Keller et al. (1995) and Rosenbum et al. (2005) used chemical testing as a measure of abstinence and the others relied on either self or clinician report. Kopera et al. (2014), Staciewicz et al. (2012) and De Haan et al. (2012b) looked at AUD populations only. However, there may have been polysubstance abuse within those samples that was not accounted for. They all reported that alexithymia was unrelated to abstinence after follow-up. Five studies assessed alexithymia at pre and post intervention to investigate whether alexithymia is a stable construct within a substance abuse population. All the studies concluded that alexithymia has no absolute stability but the majority of the studies

concluded that alexithymia has relative stability in this population. However, there were short follow-up times between re-assessment of alexithymia in the majority of the reported studies. Only one study looked at pharmacological relapse prevention and the rest were examining levels of alexithymia after a CBT based psychoeducational intervention.

The review found that psychological interventions, and in particular CBT, are effective for people with alexithymia and SUD and AUD as it may be that the skills learned help to maintain abstinence. It should be noted that the majority of the studies had short- follow up times of around 3 months. This has implications about relapse rate and if participants were followed-up over a longer period of time there may have been more incidences of relapse. The studies with had longer follow up times (Loas et al., 1997 and Kopera et al., 2014) measured relapse differently. Loas et al. (1997) relied on professional judgment and despite Kopera et al. (2014) having a year long follow up abstinence was only assessed in the preceding 30 days. It may be that there were other incidences of relapse that were not captured by assessing it in this way. However, due to the poor methodological quality of Loas et al. (1997) study and the small sample size in the pharmacotherapy condition in Keller et al. (1995) it is not possible to draw conclusions about whether alexithymia affects abstinence when medical management only is the relapse prevention treatment. Further investigation of this would be helpful to understand what, if any, role alexithymia has in abstinence and attrition rates. This may be particularly important as medical management is often first line treatment in stabilizing alcohol and drug addiction.

This is also the first systematic that has looked at changes in alexithymia after relapse prevention treatment in AUD and SUD. Five studies were reviewed to answer the review question. Four of the papers examined change in alexithymia within an SUD population and one paper (Timary et al., 2008) examined AUD only. These studies identified that alexithymia did not have absolute stability in SUD and AUD and that absolute scores changed significantly over time. Two of the studies examined changes in alexithymia after medical detox and three after psychosocial relapse prevention treatment. This is important to be aware of as the different relapse prevention treatments may affect alexithymia. Timary et al. (2008) and De Haan et al. (2014) had very short follow up times and the

physiological effects of detox were not considered. De Haan (2012a) was the only study to find that alexithymia did not have absolute stability and also that it was partially state dependent and related to anxiety and depression. This study had the largest sample size and strongest methodological quality. However, a study by the same research team (De Haan et al., 2014) found that alexithymia had relative stability. Morie et al. (2015) did not differentiate between absolute and relative stability but their study appeared to report relative stability in cocaine dependent participants after six month follow up. The conclusions drawn from this review are tentative that alexithymia has no absolute stability but is a relatively stable trait in SUD and AUD. The conclusion drawn should be taken with caution due to varying follow up times, varying sample sizes between papers, varying methodological quality and that only one study looked at AUD.

### *2.7.1 Clinical Implications*

The conclusions from this review have implications for clinical practice. It has anecdotally been assumed that having a difficulty identifying emotions would have an impact on treatment. Alexithymia has been examined as a possible predictor of poor treatment outcomes in a number of psychological disorders. Recent research into whether alexithymia affects outcome in people with depression and anxiety found that it had a negative impact on people engaging in both pharmacotherapy and psychological therapy (Mori, Drago, Ronchi & Serretti, 2015). Terock et al. (2015) conducted a study examining alexithymia as a predictor of psychotherapeutic outcome. This was a large study with over 700 participants with a range of psychological disorders. They also found that higher scores on the TAS-20 predicts poorer therapeutic outcome. However, the psychological treatments for these studies were not CBT based. It may be that people with alexithymia respond better to CBT based interventions than psychodynamic interventions and emotion focused therapies. This, in part, corresponds to the finding of this review that alexithymia in people with substance and alcohol addiction does not increase the rate of relapse. Most the studies included were CBT based. Rufer, et al. (2004) treated patients with alexithymia and OCD with CBT. They found that alexithymia had no impact on treatment outcomes and that alexithymia was also had relative stability. Again, another study with a CBT

based treatment found that people with alexithymia and fibromyalgia responded better to CBT when compared to psychoeducation (Doherty et al., 2016).

Alexithymia appears to have relative stability in a substance misuse population. This fits with theories proposed about the development of alexithymia as a product of trauma, disrupted attachment and lifelong deficits in emotional regulation. Other personality constructs that are the result of the same experiences, such as Borderline Personality Disorder, are also thought to be relatively stable but can be amenable to change through psychological therapy (see Fonagy and Bateman, 2005 for review).

### *Limitations*

The studies included in the review were not homogenous in design which makes comparisons between studies difficult. This limits the ability to draw firm conclusions from the synthesis of the papers included. All studies used the TAS-20 self-report measure to identify alexithymia. As previously discussed this is the most widely used measure reported in the literature. However, there has been some debate as to whether self-report measures of alexithymia are accurate. Leising, Grande & Faber (2009) investigated whether the TAS-20 truly captured alexithymia. They found that people who were severely depressed had higher scores on the TAS-20 due to a negative bias in their recall and assessment of their abilities. It has also been proposed that people with high levels of alexithymia are unreliable at identifying their difficulties and are unreliable at completing self-report assessments (Cameron, Ogrondniczuk & Hadjupavlou, 2014; Taylor & Bagby, 2013). This has led to researchers proposing that alexithymia should be measured using a more objective scale such as the Toronto Structured Interview for Alexithymia or the Observer Alexithymia Scale (Bagby, Taylor, Parker & Dickens, 2006; Haviland, Warren & Riggs, 2000).

The methodological quality of the studies varied considerably and all lacked a control group. There were only five studies included to answer the question whether alexithymia has stability after relapse prevention treatment and only one study looked at stability

within alcohol use disorder. Therefore, conclusions are tentative and future research should look at stability of alexithymia in AUD after relapse prevention treatment.

### *2.7.2 Future Research*

Further research into the stability of alexithymia in AUD after both psychological and pharmacological relapse prevention treatments would add to understanding of the construct of alexithymia in addictions. As the majority of the studies had short follow-up times, it may be that further research needs to consider whether assessing alexithymia at longer follow-up is able to add to understanding about the stability of this construct over longer periods of time. A possible future direction of research could investigate whether changes in alexithymia are affected by the type of intervention used. The majority of the studies here investigated a group psycho-educational Cognitive Behavioural approach. It would be helpful to see if these findings are replicated when other types of psychological relapse prevention strategies are used such as individual CBT or motivational interviewing. Also, the interventions were problem focused and there is some evidence that people with alexithymia respond better to this type of intervention when compared to more emotion-focused therapies (Cameron, Ogronczuk & Hadjupavlou, 2014; Ogronczuk, Piper & Joyce, 2011) and this warrants further investigation within a substance use population. Finally, all of the studies used the Toronto Alexithymia Scale and relied on self-report assessment of alexithymia. Further research into observer rated scales and a multi-modal assessment of alexithymia would also add further understanding as to whether alexithymia is a personality construct in people who misuse alcohol and substances.

### **2.7.3. Conclusions**

This review has been able to advance previous findings from Thorberg et al. (2009) in their review of alexithymia and alcohol use disorders. They reported mixed findings for alexithymia being related to attrition rates and relapse. This review has concluded that most papers found there is no relationship between alexithymia, attrition rates and relapse in AUD and SUD. Overall, alexithymia does not influence treatment outcomes i.e. abstinence after relapse prevention treatment. Alexithymia also does not affect attrition

from treatment. Alexithymia appears to have relative stability and be a personality trait in AUD and SUD after relapse prevention treatment.

## 2.8 REFERENCES

- American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders. 4th ed.* Washington, DC: American Psychiatric Association.
- Bagby, R. M., Taylor, G. J. & Parker, J. D. A. (1994). The Twenty-Item Toronto Alexithymia Scale -- II. Convergent, discriminant and concurrent validity. *Journal of Psychosomatic Research*, 38, 33-40.
- Bagby, R. M., Taylor, G. J. & Parker, J. D. A. & Dickens, S.E. (2006). The development of the Toronto Structured Interview for Alexithymia: item selection, factor structure, reliability and concurrent validity. *Psychotherapy and Psychosomatics*, 75, 25-39.
- Briere, J. N (1992). *Childhood abuse trauma*. Newbury Park: Sage Publications.
- Cameron, K., Ogrodniczuk, J. & Hadjipavlou, G. (2014). Changes in alexithymia following psychological intervention: a review. *Harvard Review of Psychiatry*, 22, 162-178.
- Carton, C., Bayard, S., Paget, V., Jouanne, C., Varescon, I., Edel, Y. & Detilleux, M. (2010). Emotional awareness in substance-dependent patients. *Journal of Clinical Psychology*, 66, 599-610.
- Cleland, C., Magura, S., Foote, J. Rosenblum, A. & Kosanke, N. (2005). Psychometric properties of the Toronto Alexithymia Scale (TAS-20) for substance users. *Journal of Psychosomatic Research*, 58, 299–306
- Cochrane, C. E., Brewerton, T. D., Wilson, D. B. & Hodges, E. L. (1993). Alexithymia in the eating disorders. *The International Journal of Eating Disorders*, 14, 219–22.
- Conway, K.P., Compton, W., Stinson, F.S. & Grant, B.F. (2006). Lifetime comorbidity of DSM-IV mood and anxiety disorders and specific drug use disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry*, 67, 247–257.
- Cox, B. J., Swinson, R.P., Shulman, I.D. & Bourdeau, D. (1995). Alexithymia in panic disorder and social phobia. *Comprehensive Psychiatry*, 36, 195–8.
- Deeks, J., Dinnes, J., D'Amico, R., Sowden, A., Sakarovitch, C., Song, F., Pettigrew, M. & Altman, D. G. (2003). Evaluating non-randomised intervention studies, *Health Technology Assessment*, 7, 1-173.
- de Haan, H.A., Joosten, E.A.G., Wijdeveld, A.G.M., Boswinkel, P., van der Palen., J. & De Jong, C.A.J. (2012a). Alexithymia is not a stable personality trait in patients with substance use disorders. *Psychiatry Research* 198, 123–129.
- de Haan, H.A., Schellekens, A.F., van der Palen, J., Verkes, R.J., Buitelaar, J.K. & De Jong, C.A. (2012b). The level of alexithymia in alcohol-dependent patients does not influence outcomes after inpatient treatment. *American Journal of Drug and Alcohol Abuse*, 38, 299–304.

de Haan H. A., van der Palen J., Toon G.M. Wijdeveld G. M., Jan K. Buitelaar J. K. & De Jong, C. J. (2014). Alexithymia in patients with substance use disorders: State or trait? *Psychiatry Research*, *216*, 137-145.

de Timary, P., Luts, A., Hers, D., & Luminet, O. (2008). Absolute and relative stability of alexithymia in alcoholic inpatients undergoing alcohol withdrawal: Relationship to depression and anxiety. *Psychiatry Research*, *157*, 105–113.

Demer, L. A., Olson, E. A., Crowley, Ruanch, S. L. & Rosso, I. M. (2015). Dorsal anterior cingulate thickness is related to alexithymia in childhood trauma related PTSD. *PLoS One*, *10*, 21-26.

Downs, S.H., & Black, N. (1998). The feasibility of creating a checklist for the assessment of the methodological quality both of randomized and non-randomized studies of health care interventions. *Journal of Epidemiology Community Health*, *52*, 377-384.

Hamidi, S., Rostami, R., Farhoodi, F. & Abdolmanafi, A. (2010). A study and comparison of Alexithymia among patients with substance use disorder and normal people. *Procedia Social and Behavioral Sciences*, *5*, 1367–137.

Haviland, M. G., Warren, W. L. & Riggs, M. L. (2000). An observer scale to measure alexithymia. *Psychosomatics*, *41*, 385-392.

Hintikka J., Honkalampi K., Koivumaa-Honkanen H., Antikainen R., Tanskanen A., Haatainen K., et al. (2004). Alexithymia and suicidal ideation: a 12-month follow-up study in a general population. *Comprehensive Psychiatry*, *45*, 340–345.

Honkalampi K., Hintikka J., Tanskanen A., Lehtonen J. & Viinamäki H. (2000). Depression is strongly associated with alexithymia in the general population. *Journal of Psychosomatic Research*, *48*, 99–104.

Kim, J.H., Lee, S.J., Rim, H.D., Kim, H.W., Bae, G.Y. & Chang, S.M. (2008). "The Relationship between Alexithymia and General Symptoms of Patients with Depressive Disorders". *Psychiatry Investigation*, *5*, 179–85.

Lane R. D. (2008). Neural substrates of implicit and explicit emotional processes: a unifying framework for psychosomatic medicine. *Psychosomatic Medicine*, *70*, 214–231.

Leising, D., Grande, T. & Faber, R. (2009). The Toronto Alexithymia Scale (TAS-20): a measure of general psychological distress. *Journal of Research in Personality*, *43*, 707-710.

Loas, G., Fremaux, D., Otmani, O., Lecercle, C. & Delahousse, J. (1997). Is alexithymia a negative factor for maintaining abstinence? A follow- up study. *Comprehensive Psychiatry*, *38*, 296–9.

Luminet, O. Bagby, R.M. & Taylor, G.J. (2001). An evaluation of the absolute and relative stability of alexithymia in patients with major depression. *Psychotherapy and Psychosomatics*, 70, 254-260.

Lyvers, M., Onuoha, R., Thorberg, F. & Samios, C. (2011). Alexithymia in relation to parental alcoholism, everyday frontal lobe functioning and alcohol consumption in a non-clinical sample. *Addictive Behaviours*, 37, 205-210.

Keller, D.S., Carroll, K.M., Nich, C. & Rounsaville, B.J. (1995). Alexithymia in cocaine abusers: response to psychotherapy and pharmacotherapy. *American Journal of Addiction*, 4, 234-44.

Kopera, M., Jakubczyk, A., Suszek, H., Glass, J. M., Klimkiewicz A., Wnorowska K. J. & Wojnan, M. (2014). Relationship Between Emotional Processing, Drinking Severity and Relapse in Adults Treated for Alcohol Dependence in Poland. *Alcohol and Alcoholism* 50, 173-179.

Marchesi, C. (2015). How useful is the construct of alexithymia for understanding the risk of mental disorders. *Acta Psychopathologica*, 2, 73-76.

Marchesi C., Ossola P., Tonna M. & De Panfilis C. (2014). The TAS-20 more likely measures negative affects rather than alexithymia itself in patients with major depression, panic disorder, eating disorders and substance use disorders. *Comprehensive Psychiatry*, 55, 972-978.

Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement*. <http://www.prisma-statement.org> (accessed January 2017).

Morie, K. P., Nich, C., Hunkele, K., Potenza, M. N. & Carroll, K. M. (2015). Alexithymia level and response to computer-based training in cognitive behavioral therapy among cocaine-dependent methadone maintained individuals. *Drug Alcohol Dependence*, 152, 157-163.

National Institute for Health and Clinical Excellence. (2007). *Drug Misuse: Psychosocial Intervention. Clinical Guideline 51*, NICE: London.

National Institute for Health and Clinical Excellence. (2011). *Alcohol-use disorders Diagnosis, assessment and management of harmful drinking and alcohol dependence. Clinical Guideline 115*. NICE: London.

Ogrodniczuk J. S., Piper W. E. & Joyce A. S. (2011). Effect of alexithymia on the process and outcome of psychotherapy: a programmatic review. *Psychiatry Research*, 190, 43-48.

Ogrodniczuk J. S., Piper W. E. & Joyce A. S. (2013). Change in alexithymia in two dynamically informed individual psychotherapies. *Psychotherapy and Psychosomatics*, 82, 61-63.

- Olmunen, T., Lehto, S. M., Heliste, M., Kurl, S. & Kauhanen, J. (2010). Alexithymia is associated with increased cardiovascular mortality in middle-aged Finnish men. *Psychosomatic Medicine*, *72*, 187–191.
- Parker, J.D.A., Keefer, K.V., Taylor, G.J. & Bagby, R.M. (2008). Latent structure of the alexithymia construct: a taxometric investigation. *Psychological Assessment*, *20*, 385-96.
- Parker, J. D.A., Taylor, G. J. & Bagby, R. M. (2001). The Relationship Between Emotional Intelligence and Alexithymia. *Personality and Individual Differences*, *30*, 107–115.
- Paivio, S.C. & McCulloch, C. R. (2004). Alexithymia as a mediator between childhood trauma and self-injurious behaviors. *Child Abuse Neglect*, *28*, 339–354.
- Rosenblum, A., Foote, J., Cleland, C., Magura, S., Mahmood, D., & Kosanke, N. (2005). Moderators of effects of motivational enhancements to cognitive behavioral therapy. *The American Journal of Drug and Alcohol Abuse*, *31*, 35–58.
- Saarijärvi, S., Salminen, J.K. & Toikka, T.B. (2006). Temporal stability of alexithymia over a five-year period in outpatients with major depression. *Psychotherapy and Psychosomatics*, *75*, 107-112.
- Salminen J. K., Saarijärvi S., Äärelä E., Toikka T., & Kauhanen J. (1999). Prevalence of alexithymia and its association with sociodemographic variables in the general population of Finland. *Journal of Psychosomatic Research*, *1*, 75–82.
- Samur, D., Tops, M., Schlinkert, C., Cuijpers, P., & Koole, S. L. (2013). Four decades of research on alexithymia: moving toward clinical applications. *Frontiers of Psychology*, *4*, 861-868.
- Scottish Intercollegiate Guidelines Network. (2008). SIGN 50: A guideline developer's handbook. <http://www.sign.ac.uk/pdf/sign50.pdf> (accessed December 2016).
- Sifneos P. E. (1973). The prevalence of 'alexithymic' characteristics in psychosomatic patients. *Psychotherapy and Psychosomatics*, *22*, 255–262.
- Spitzer. C., Vogel, M., Barnow, S., Freyberger, H.J. & Grabe, H. J. (2007). Psychopathology and alexithymia in severe mental illness: the impact of trauma and posttraumatic stress symptoms. *European Archives of Psychiatry and Clinical Neuroscience*, *257*, 191–196.
- Stasiewicz, P.R., Bradizza, C.M., Gudleski, G.D., Coffey, S.F., Schlauch, R.C., Bailey, S.T., Bole, C.W. & Gulliver, S.B. (2012). The relationship of alexithymia to emotional dysregulation within an alcohol dependent treatment sample. *Addictive Behaviors* *37*, 469–476.
- Taylor G. J., & Bagby R. M. (2013). Psychoanalysis and empirical research: an example of alexithymia. *Journal of Psychoanalytic Association*, *61*, 99-133.

Taylor, G.J., Bagby, R.M., & Parker, J.D.A. (1997). *Disorders of affect regulation: alexithymia in medical and psychiatric illness*. Cambridge University Press: Cambridge.

Taylor, G. J., Bagby, M.R., Parker, J.D.A. (1999). Disorders of Affect Regulation: Alexithymia in *Medical and Psychiatric Illness*. Cambridge: Cambridge University Press.

Taylor, G.J., Parker, J. D. & Bagby, R.M. (1990). A preliminary investigation of alexithymia in men with psychoactive substance dependence. *The American Journal of Psychiatry*, 147, 1228–1230.

Taylor, G. J., Parker, J. D. A., & Bagby, R. M. (2003). The twenty-item Toronto Alexithymia Scale-IV. Cross-cultural validity and reliability. *Journal of Psychosomatic Research*, 55, 277-283

Tolmunen T., Lehto S. M., Heliste M., Kurl S. & Kauhanen J. (2010). Alexithymia is associated with increased cardiovascular mortality in middle-aged Finnish men. *Psychosomatic Medicine*, 72, 187–191.

Thorberg, F. A., Young, R. M., Sullivan, K. A. & Lyvers, M. (2009). Alexithymia and alcohol use disorders: a critical review. *Addictive Behavior*, 34, 237-45.

Thorberg, F. A., Young, R. M., Sullivan, K. A., Lyvers, M., Connor, J. P. & Feeney, G. F. (2011). Alexithymia, craving and attachment in a heavy drinking population. *Addictive Behaviors*, 36, 427–430

Walton, M. A, Blow, F. C., Bingham, C. R. & Chermack, S. T. (2003). Individual and social/ environmental predictors of alcohol and drug use 2 years following substance abuse treatment. *Addictive Behaviour*, 28, 627-642.

Xie, H., McHugo, G. J., Fox, M. B., Drake, R.E. (2005). Substance abuse relapse in a ten-year prospective follow-up of clients with mental and substance abuse disorders. *Psychiatry Severity*, 56, 1282-1287.

Zlotnick, C., Mattia, J.I., & Zimmerman, M. (2001). The relationship between posttraumatic stress disorder, childhood trauma and alexithymia in an outpatient sample. *Journal of Traumatic Stress*, 14, 177–88.

**3.1 Empirical Paper: Trauma, Alexithymia, Emotional Regulation and Dissociation in Alcohol Use Disorder, Substance Use Disorder and Polysubstance Disorder**

Word count: Abstract (including highlights): 253

Empirical Paper: 5069 (excluding tables and figures); 5474 (including all tables and figures)

### 3.2 ABSTRACT

**Objective:** There has been much research into the prevalence of trauma within alcohol and substance use populations. However, it is less well known what psychological variables influence the relationship between trauma and addiction. To date there has been no studies looking at whether there are differences between experience of trauma, alexithymia, dissociation and emotional regulation and type of addiction. This study aims to investigate whether participants with poly-substance addiction will have higher incidents of trauma, dissociation, alexithymia and poorer emotional regulation when compared to alcohol and drug dependence alone.

**Method:** 91 participants took part in the study and completed four self-report measures: Impact of Events Scale-Revised, Toronto Alexithymia Scale, Difficulties in Emotional Regulation Scale and the Dissociative Experiences Scale.

**Results:** There were no significant differences between AUD, SUD and polysubstance use with regards to trauma, alexithymia and emotional regulation. Participants in the polysubstance group had significantly higher scores on the dissociation measure. Multiple regression analysis found that emotional regulation, alexithymia and dissociation could predict 47% of the variance of trauma when the whole dataset was pooled.

**Conclusions:** It appears that what type of addiction is not important in people with trauma and emotional regulation problems. Emotional dysregulation, alexithymia and dissociation predict trauma in people with alcohol and substance use disorders.

### 3.3 Highlights

- **No differences in trauma, emotional regulation and alexithymia between groups**
- **Dissociation was significantly higher in the polysubstance use group**
- **Multiple regression found that trauma could be predicted by emotional regulation, alexithymia and dissociation in a mixed alcohol and drug addiction population.**

**KEYWORDS:** Trauma, alexithymia, dissociation, emotional regulation, alcohol use disorder, substance use disorder

### **3.4 INTRODUCTION**

#### *Trauma and Dissociation in Addiction*

Many of the people who attend treatment for substance use disorder (SUD) and alcohol use disorder (AUD) have a history of trauma (Jacobsen, Southwick and Kosten, 2001). Some estimates put this at between 33-50% (Brady et al., 2004). Experiencing trauma can lead to psychological disorders, emotional dysregulation and dissociation (Read, Brown & Kahler, 2004). Trauma also heightens the risk of developing drug and alcohol addiction (Dansky et al., 1997; Deykin and Buka, 1997). Chilcoat & Menard (2003) found that adults diagnosed with post-traumatic stress disorder (PTSD) are five times more likely to misuse alcohol and drugs than those without PTSD. Driessen et al. (2008) conducted a multi-site study looking at prevalence rates of trauma in addiction. They found that almost 40% of the substance users met criteria for PTSD. This was higher when compared with the AUD group (34%). This is significantly higher than lifetime prevalence for adults in the general population which is estimated to be between 3.6% and 9.7% (Kessler et al., 2005). Given that AUD and SUD populations are likely to have high rates of trauma and have other significant mental health disorders (Miller, Forchimes & Zweben, 2011) it is important to understand the psychological variables that affect the relationship between trauma and addiction.

The high comorbidity of early life trauma and addiction have led researchers and clinicians to conceptualise addiction as an attachment disorder (see Flores, 2011). Attachment theory identifies different patterns of attachment which directly influence how people regulate emotions and cope in times of stress (Hesse, 1999). The prevalent theory of addiction development and maintenance is that that substance abuse is a “chemical dissociation” and an attempt by people to manage their emotions (Roesler & Dafler, 1993). There is some evidence that people with trauma histories who misuse alcohol and drugs do so to forget trauma memories (Somer, Altus and Ginzburg, 2010). De Rick et al. (2009) looked at AUD and attachment style in 101 inpatients. They found that most patients reported disrupted attachments and had co-morbid psychiatric diagnoses. A review of attachment and addiction in adolescents also found that people

with addictions more often reported insecure attachment relationships when compared to healthy controls and this was a highly significant and large effect (Schindler et al. 2007).

Researchers found that PTSD in SUD patients most often occurs prior to development of addiction and that childhood abuse was the most commonly reported trauma (Brady, Dansky, Sonne & Saladin, 1998). Trauma, and childhood trauma has been found to be an important predictor of dissociation (Chu & Dill, 1990). Zlotnick et al. (1997) reported that dissociation is related to trauma in psychiatric patients with SUD. Studies investigating dissociation in substance abuse have found that it is related to addiction severity, suicidality and it may have a detrimental impact on treatment outcome (Karadag et al., 2005; Evren et al., 2007). Karadag et al. (2005) found that patients with SUD who had comorbid problems with dissociation and trauma also used a higher number of different drugs. Najavits and Walsh (2012) found that people who reported higher levels of dissociation held the belief that their substance misuse could manage their emotional distress. Having poor attachment relationships

### *Emotional Regulation in Addiction*

The experience of a traumatic event, especially in childhood, can lead to lifelong difficulties with emotional regulation and dissociation (Demers, 2015). Petit et al. (2015) found that emotional dysregulation may maintain AUD and SUD as it increases cravings for alcohol which is used as a way to manage distress. Having disrupted attachments can lead to maladaptive coping strategies such as poor emotional regulation (Meifen et al., 2005). Emotional regulation refers to the inability to manage behaviour when distressed, a lack of understanding and awareness of one's emotional response and a lack of helpful problem solving strategies to manage this distress (Aldao and Nolen-Hoeksema, 2010). Emotional regulation also encompasses an unwillingness to feel emotion and therefore people actively seek to avoid feelings (Gratz and Roemer, 2004). Gratz and Roemer (2004) have identified impulse control as a behavioural component of emotional regulation. This may be particularly relevant to substance use populations where gratification seeking (drug use) occurs in the context of efforts to regulate one's emotions and reduce aversive feelings (Tice et al., 2001). This has been identified as an important

component to address in the treatment and management of addiction (Evrenden, 1999; Fox et al, 2007). Several studies have found that individuals who have experienced trauma struggle to regulate their emotions (Tull et al, 2007; Weiss, Tull, Anestis and Gratz, 2013). In addition, individuals with SUD who have experienced trauma have poor emotional control and impaired emotional processing compared to individuals without a concurrent addiction (Fox, Hong & Singa, 2008; Foa and Kozak, 1988).

One particular example of difficulties in affect regulation commonly found in SUD and AUD is alexithymia (Taylor, Bagby & Parker, 1997). It was first identified by Sifeneos (1973) as an inability to describe emotion. Taylor, Parker and Bagby (1997) have further defined and broadened the original concept and have identified five key deficits people with alexithymia display. These are: difficulty in identifying emotion, difficulty in expressing feelings, reduction or inability to experience emotions, difficulty in imaging another person's emotions and finally, a limited capacity to fantasize or use representational thought (Taylor, Bagby and Luminet, 2000). Estimates of rates of alexithymia in the general population range between 6% and 10% (Hintikka et al., 2001; Kokkonen et al., 2001). A review of alexithymia in alcohol use disorders indicated prevalence rates between 45% and 67% (Thorberg et al., 2009). Individuals with SUD also have higher levels of alexithymia, with reported rates of 42% in one study and 50% in another (Haviland et al., 1994, 1988).

Thorberg et al. (2011) examined attachment relationships and alexithymia in an AUD population and found that alexithymic people with AUD reported higher levels of childhood trauma and higher levels of anxious attachment than non alexithymic AUD participants. Alexithymia has been proposed to be a consequence of complex trauma, disrupted attachment and associated with dissociation (Bermond et al., 2008; Berenbaum & James, 1994; Schafer et al., 2010). It has been proposed by Berenbaum (1996) that alexithymia may itself be a reaction to early trauma and functions as a coping mechanism to "numb" body sensations and emotions. This same "numbness" is common in individuals with dissociative disorders. Symptoms of dissociation resulting from trauma may include feelings of depersonalization and a lack of integration of thoughts, feelings

and experiences which can result in fragmented memories of the trauma (APA, 2000). Bujarski, Klanecky & McChargue (2010) found the relationship between alexithymia and alcohol-related risk was moderated by exposure to trauma. They also found that exposure to multiple traumatic events were associated with greater scores on the Toronto Alexithymia Scale (TAS; Parker and Bagby, 1997). It has been hypothesized that dissociation may be protective in cases of severe trauma (van Ijssendoorn & Schuengel, 1996; Giesbrecht, Lynn, Lilienfeld & Meckelbach, 2008). However, in the longer term, dissociation is associated with poorer psychological outcomes (Breire, 2006).

### **3.4.1 Rationale**

To date, literature examining the relationship between PTSD, dissociation, alexithymia and emotional regulation in addiction is limited. It has been widely established that there is a link between trauma and addiction but it is less well understood what other psychological variables affect the relationship between the two. Some studies have examined combinations of these constructs but most have used an AUD population only. Stasiewicz et al. (2012) identified the need to understand whether severity of alexithymia is related to type of substance misuse. Schafer et al., (2010) conducted a large, multi-site study examining childhood trauma and dissociation in AUD, SUD and polysubstance misuse. They found that people with polysubstance misuse had higher levels of dissociation than the other two groups. They also found higher levels of reported childhood traumatic experiences in the polysubstance group when compared to alcohol and drug use disorders. Craparo, Ardino, Gori and Caretti (2014) examined the relationships between trauma, dissociation and alexithymia in AUD. They concluded that these variables are predictors of alcohol addiction. Due to this previous research, it was decided to extend what has been previously investigated as there is no published research looking at whether alexithymia, emotional regulation and dissociation influence the relationship between PTSD and types of addiction. Understanding the nature of these relationships and also the prevalence of PTSD, alexithymia, dissociation and poor emotional regulation ability could aid assessment of the psychological difficulties of people who present to services with addiction issues. It has been established that poor

emotional regulation and attachment relationships have a detrimental effect on therapeutic alliance and treatment outcome (see Smith, Msetfi & Golding, 2010 for a review). Therefore, due to the relapsing nature of addiction it is important to understand what factors may negatively influence treatment outcome. The aim of the study is to explore the relationships between alexithymia, emotional regulation and dissociation are how they relate to PTSD in SUD, AUD and polysubstance use groups. Therefore, it is predicted that participants with poly-substance addiction will have higher incidents of trauma, dissociation, alexithymia and poorer emotional regulation when compared to alcohol and drug dependence alone.

### **3.5 METHODS**

#### **3.5.1 Participants**

The study population was selected from people who had alcohol and drug problems who had attended NHS addiction services. All participants were screened at initial assessment for suitability for the service by the nursing team and they were identified as having SUD, AUD or both using ICD-10 criteria. Participants were included if they had a history of alcohol, drug or poly-substance abuse and were over 16 years of age. Participants were excluded if they had a cognitive impairment, current psychosis or had been misusing substances within the previous two weeks. Participants had to be abstinent for two weeks prior to completing the questionnaires as it has been found that there can be people can confuse the effects of the substances themselves, the symptoms of withdrawal and the experience of dissociation (Langeland, Draijer & van der Brink, 2002). Participants had to be able to give their informed consent to take part in the study.

In total 138 individuals were invited to take part. Of those 10 people declined with the most common reasons given were that they did not want to or that they did not have time. 31 people had misused alcohol or drugs in the two weeks prior to the study and were therefore ineligible to take part. Therefore, a total of 97 people took part in the study.

### *Power Analysis*

A power analysis was conducted to determine the number of participants necessary for regression analyses. For this investigation, power was set at 0.80, alpha was set at 0.05, and a moderate effect size ( $F=0.15$ ) (Cohen 1977) was assumed. This effect size was based on previous research findings that looked at differences in types of substance misuse, dissociation and trauma (see Schafer et al., 2010). The analysis indicated that a total of 117 participants, which is 39 participants for each group, were needed for this investigation.

### **3.5.2 Materials**

#### *Impact of Events Scale-Revised (Weiss and Marmar, 1997)*

The IES-R was developed to reflect the DSM-IV criteria for post-traumatic stress disorder (PTSD). It is a 22-item self-report measure that assesses distress caused by traumatic events. Items correspond to 14 of the 17 DSM-IV symptoms of PTSD. Respondents are asked to consider a traumatic incident they have experienced and then indicate how much they were distressed or bothered by it during the past week. Items are rated on a 5-point Likert scale ranging from 0 ("not at all") to 4 ("extremely"). The IES-R yields a total score and subscale scores can also be calculated for the intrusion, avoidance, and hyperarousal subscales. The IES-R was not developed to be diagnostic, however, cutoff scores of greater than 33 for a preliminary diagnosis of PTSD have been cited in the literature. For this sample, internal consistency was Cronbach's  $\alpha=0.77$ .

#### *Toronto Alexithymia Scale (TAS-20; Bagby, Taylor & Parker, 1994)*

This measure is a 20 item self-report scale. It has a five-point Likert scale and asked participants to rate their agreement to statements about emotion. It has 3 dimensions: difficulty identifying feelings (DIF), difficulty describing feelings (DDF) and externally oriented thinking (EOT). This measure was chosen as it has good internal consistency Cronbach's  $\alpha=0.91$  for this sample. It is the most reliable measure of alexithymia reported in the literature. In addition, it has been used extensively and validated for use within alcohol and drug addicted populations (Cleland et al, 2008).

*Difficulties in Emotional Regulation Scale (DERS; Gratz & Roemer, 2004)*

The DERS is a 36-item self-report questionnaire designed to assess multiple aspects of emotion dysregulation. It is a 5-point Likert scale that asks participants to rate how often they thought or performed the statements. The measure produces a total score as well as scores on six scales: non-acceptance of emotional responses, difficulties engaging in goal directed behaviour, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies and lack of emotional clarity. There is no cut-off score for the DERS but higher scores indicate more difficulties with emotional regulation. The DERS displayed good internal consistency (Cronbach's alpha = 0.93 for this sample). Although it has not been specifically validated in an addictions population it has been used extensively with people with AUD and SUD (see Azizi, Borjali & Golzari, 2010; Staciewicz et al., 2008).

*Dissociative Experiences Scale (DES; Bernstein and Putnam, 1986)*

The DES is used to measure dissociative symptoms. It is a 28 item self-report measure. It is not diagnostic and rather is a screening tool. It asks participants to rate a percentage of how often they have experienced the statements in the measure. An average score is then calculated and any score over 30% indicates problems with dissociation. It has 3 subscales: absorption, depersonalisation and amnesia. It will be made clear to respondents to report only on experiences they have had while not under the influence of alcohol or drugs. This measure was chosen as it has well established predictive validity of dissociative disorders and traumatic experiences. Internal consistency for this sample was Cronbach's alpha=0.82.

### **3.5.3 Procedure**

Individuals attending NHS addiction services were provided with a study information sheet by their usual key worker who was either a nurse or psychologist. Participants were given information forms about the study and if they decided to take part gave their written consent. Almost all questionnaires were administered by the principal researcher and were completed in the clinic. Approximately 15% of the questionnaires were read out to participants for them to give their response orally. This was due to low levels of literacy

and people needing additional support to complete the questionnaires. All responses to the questionnaires and demographic information were kept anonymous and all procedures were approved by national and local NHS Ethics Committees.

## **3.6 RESULTS**

### **3.6.1 Exploratory analysis**

Exploratory analysis was undertaken to look at data distribution by plotting histograms and Q-Q plots for all outcome variables. From this it was observed that the data was normally distributed and parametric analysis was used. Boxplots and scatterplots were carried out to check for outliers. Using a limit of z-score  $\pm 3.29$  no data points were found to be out with this (Field, 2013). Therefore, the data did not need to be trimmed or transformed.

#### *Missing Data*

One participant's data was excluded due to non-completion of an entire questionnaire. A further seven people's data was excluded as they had indicated on their questionnaire pack that they had misused substances in the past two weeks. Missing data for the whole sample was less than 1%. No questionnaire had more than the acceptable number of missing items as specified per the questionnaire manuals. Therefore, the missing items were prorated by calculating the individual means and that was used to replace missing items.

### **3.6.2 Overall Sample Data**

The final sample included 115 individuals (47 male and 44 females). Participants were divided into three groups based on the nature of their addiction issue: alcohol misuse (N=40), drug misuse (N=36) and poly-substance misuse (N=39). Participants had an age range from 18 years to 63 years (mean=38.02, s.d.=10.11). The mean duration of time for addiction was 15.6 years (s.d. 9.76 years). In terms of educational experience, 61.7% of people had school as their highest educational attainment, 28.7% had attended college and

9.6% had attended university. Participants provided their postcode as a way of determining social deprivation. This was calculated using the Scottish Index of Multiple Deprivation (2016). Deprivation in a local area is calculated using several factors including income, employment, health, education level, housing, access to community services and crime rate. This gives a score from 1-5 where level 1 is the most deprived and level 5 is the most affluent. Analysis of postcode revealed that 88.7% of participants lived in the areas defined as deprived (levels 1 and 2). The rest of the participants lived in level 3 (8.7%) and level 4 (2.6%).

In the overall sample, 78 people (67.8%) scored over the cut-off on the Impact of Events Scale Revised (Weiss and Marmar, 1997) which would indicate they meet criteria for a diagnosis of PTSD. On the TAS-20 62 people (53.9%) were identified as having alexithymia and 21 (18.3%) fell within the category of possible alexithymia. The average score on the DERS was 108 (with the total possible score 180). The average score on the DES for all participants was 27, slightly below the cut-off score of 30 indicating a dissociative disorder. Overall, 53 people (46.1%) scored over 30 indicating a problem with dissociation. In the SUD condition participants reported the drugs they were addicted to were heroin (56%), Valium (60%), diazepam (36%), painkillers (24%), cannabis (26%) and cocaine (20%). Most people in the SUD group used multiple drugs (77%). In the polysubstance group as well as misusing alcohol, the type of drugs misused was diazepam (65%), Valium (53%), heroin (47%), painkillers (33%), cannabis, (18%), ecstasy (5%) and LSD (4%).

### **3.6.3 Differences Between Groups**

#### *Demographics*

Differences between groups were tested with Chi Square and one-way ANOVA's to ensure that there were no differences in demographic characteristics. Table 1 shows that there were no significant differences between the groups with respect to gender, education, duration of addiction and SIMD score ( $p > 0.05$ ).

*Differences on Measures between Addiction Groups*

A one-way ANOVA was conducted to determine if severity of PTSD scores as measured by IES was different for SUD, AUD and polysubstance use. There were no outliers as assessed by boxplot; data was normally distributed for each group, as assessed by Shapiro-Wilk test (AUD  $p=0.6$ ; SUD  $p=0.53$ ; poly  $p=0.41$ ) and examination of Q-Q plots. There was homogeneity of variances, as assessed by Levene’s test of homogeneity of variances ( $p=0.87$ ). PTSD scores were higher in the polysubstance misuse group (AUD mean 39.18 s.d. 15.48; SUD mean 39.47 s.d. 16.6; poly 44.15 s.d. 16.35), but the differences between types of addiction was not statistically significant,  $F(2,112)=1.14$ ,  $p=0.34$ .

Table 1: Demographic Characteristics of the Addiction Groups

<i>Participant Characteristics</i>	<i>AUD (n=40)</i>	<i>SUD (n=36)</i>	<i>Poly (n=39)</i>	<i>Statistic (df)</i>	<i>P value</i>
<i>Mean Age (years)</i> <i>s.d.</i>	40.6 (9.7)	35.6 (9.5)	37.6 (9.8)	F(2)=2.4	0.09
<i>Gender</i>	52.5% M 47.5% F	52.8% M 47.2% F	51.3% M 48.7% F	$\chi^2(2)=0.02$	0.99
<i>Education*</i>					
<i>School</i>	52.5%	61.1%	71.8%	$\chi^2(4)=3.96$	0.41
<i>College</i>	32.5%	30.6%	23.1%		
<i>University</i>	15.0%	8.3%	5.1%		
<i>Mean duration of addiction (years)</i>	14.9	15.3	16.6	F(2)=0.3	0.74
<i>SIMD</i>					
<i>Deprived</i>	85%	92%	90%	$\chi^2(6)=2.43$	0.88
<i>Average</i>	10%	8%	8%		
<i>Affluent</i>	5%	0%	2%		

\*Indicates highest educational level achieved

Alexithymia and type of addiction was also of interest as it was hypothesized that levels of alexithymia would be higher in the polysubstance group. A one-way ANOVA was conducted to determine if there was any significant difference between groups. Again, TAS-20 total scores were higher in the polysubstance misuse group (AUD mean 58.33 s.d. 14.17; SUD mean 59.53 s.d. 14.31; poly 61.23 s.d. 15.69), but the differences between types of addiction was not statistically significant,  $F(2,112)=0.39$ ,  $p=0.68$ .

Differences between total emotional regulation score and type of addiction was also explored. A one-way ANOVA was conducted to determine if there was any significant difference between groups. Again, emotional regulation scores were higher in the polysubstance misuse group (AUD mean 105.68 s.d. 19.92; SUD mean 105.17 s.d. 19.09; poly 113.26 s.d. 24.66), but the differences between types of addiction was not statistically significant,  $F(2,112)=1.73, p=0.18$ .

Finally, difference between scores on the DES as a measure of dissociation and type of addiction was explored. A one-way ANOVA was conducted. Again, dissociation scores were higher for the polysubstance use group (AUD mean 23.95, s.d. 13.26; SUD mean 24.19 s.d. 15.72; poly mean 32.73 s.d. 13.31). There was a significant difference found between groups  $F(2,112)=4.88, p=0.009$ . Tukey post hoc analysis revealed that there was a significant difference in DES score between polysubstance misuse and AUD (mean difference 10.54, 95% CI (1.3-19.77)) where  $p=0.021$ . There was also a significant difference between polysubstance misuse and SUD (mean difference 10.27, 95% CI (1.04-19.49)) where  $p=0.025$ . This is summarised in Table 2.

Table 2: Differences between addiction groups

<i>Psychological Variable</i>	<i>AUD (n=29)</i>	<i>SUD (n=29)</i>	<i>Poly (n=33)</i>	<i>Statistic (df)</i>	<i>P value</i>
<i>PTSD (mean, s.d.)</i>	39.18 15.48	39.47 16.68	44.15 16.76	$F(2,112)=1.14$	0.32
<i>Emotional Regulation (mean, s.d.)</i>	105.68 19.93	105.17 19.09	113.26 24.66	$F(2,112)=0.18$	0.18
<i>Alexithymia (mean, s.d.)</i>	58.33 14.17	59.33 14.31	61.23 15.69	$F(2,112)=1.73$	0.18
<i>Dissociation (mean, s.d.)</i>	23.95 13.26	24.19 15.71	32.73 13.31	$F(2,112)=4.88$	0.009

### 3.6.4 Relationships between PTSD, alexithymia, dissociation and emotional regulation

As there were no significant differences between the three addiction groups and severity of PTSD scores, the data from the three groups was pooled for the correlation and regression analyses. The correlation table for PTSD, dissociation, emotional regulation and its subscales, and alexithymia and its subscales, are included below in Table 3.

**Table 3:** Correlation Table

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1.PTSD	-	-	-	-	-	-	-	-	-	-	-	-
2.DERS TOTAL	0.406 **	-	-	-	-	-	-	-	-	-	-	-
3.DERS- CLARITY	0.026	0.61* *	-	-	-	-	-	-	-	-	-	-
4.DERS- AWARE NESS	0.293 *	0.78* *	0.51* *	-	-	-	-	-	-	-	-	-
5.DERS- IMPULSE	0.292 *	0.71* *	0.48* *	0.54* *	-	-	-	-	-	-	-	-
6.DERS- NONACC EPT	0.256 *	0.74* *	0.45* *	0.63* *	0.66* *	-	-	-	-	-	-	-
7.DERS- GOAL	0.391 **	0.64* *	0.34* *	0.53* *	0.67* *	0.56* *	-	-	-	-	-	-
8.DERS- STRATE GY	0.42* *	0.76* *	0.44* *	0.62* *	0.79* *	0.69* *	0.72* *	-	-	-	-	-
9.TAS TOTAL	0.565 **	0.642 **	0.376 **	0.523 **	0.417 **	0.4**	0.431 **	0.511 **	-	-	-	-
10.TAS- DIF	0.526 **	0.604 **	0.342 **	0.487 **	0.44* *	0.424 **	0.442 **	0.483 **	0.88 **	-	-	-
11.TAS- DDF	0.54* *	0.608 **	0.362 **	0.477 **	0.4**	0.417 **	0.368 **	0.493 **	0.89 **	0.76* *	-	-
12.TAS- EOT	0.526 **	0.62* *	0.392 **	0.46* *	0.406 **	0.394 **	0.353 *	0.476 **	0.9* *	0.73* *	0.78 **	-
13. DES	0.652 **	0.495 **	0.175	0.422 **	0.485 **	0.355 *	0.516 **	0.487 **	0.54 **	0.479 **	0.52 **	0.528 **

\*Significant  $p < 0.05$

\*\*significant  $p < 0.001$

A multiple regression was undertaken to determine if emotional regulation, alexithymia and dissociation could predict severity of PTSD symptoms in this population. Subscales and total scores of each of the measures were examined to understand the relationships

between the variables and PTSD symptoms. It was found that total scores on the DERS, DES and TAS-20 provided the most predictive value. The results of the multiple regression were significant,  $R^2= 0.49$   $F(3,111)=35.18$ ,  $p<0.001$ . The model predicts 49% of variance in PTSD symptom severity in this population. See Table 4 for summary of regression. The regression shows that emotional regulation does not significantly contribute to the overall predictive utility. Alexithymia and dissociation can significantly predict severity of PTSD scores in a mixed sample of people with AUD, SUD and polysubstance misuse.

**Table 4:** Summary of Multiple Regression for Variables Predicting PTSD Symptom Severity

	<b>B</b>	<b>SE B</b>	<b>β</b>	<b>R<sup>2</sup></b>	<b>Sig. (p)</b>
<i>Emotional Regulation</i>	0.048	0.066	0.063		0.47
<i>Alexithymia</i>	0.243	0.096	0.218		0.013
<i>Dissociation</i>	0.594	0.09	0.53		<0.001
				0.49	

B indicates unstandardized beta coefficient; SE B is standard error of B; β is standardised beta coefficient; R<sup>2</sup>, coefficient of determination for whole regression

### 3.7 DISCUSSION

The aim of this research was to explore whether alexithymia, emotional regulation and dissociation were related to trauma in SUD, AUD and polysubstance use. This study found that alexithymia, poor emotional regulation and dissociation was able to predict a significant amount of variance in PTSD in a mixed AUD, SUD and polysubstance use population. This means that 49% of the variance in people with PTSD seems to be accounted for by dissociation, alexithymia and poor emotional regulation. Based on previous research it was predicted that the polysubstance group would have higher rates of PTSD, alexithymia, dissociation and poorer emotional regulation. Although the average scores on all of these variables was higher for the polysubstance group, the study did not find evidence that there were statistically significant differences between the three addiction groups and experience of trauma. There was a significant difference in experience of dissociation between the groups with people with polysubstance misuse experiencing significantly more problems with dissociation. The average scores of the

polysubstance group was also above the DES cut-off of 30 indicating clinically significant issues with dissociation. The prevalence of alexithymia (58.2%) in the whole group was in line with previous research that looked at alexithymia in AUD with reported rates being between 45-67% (Thorberg et al., 2009). The average score on the DERS indicated that people in all three groups had difficulties with emotional regulation. This fits with previous research which suggests that people with AUD and SUD have poorer emotional control when compared to social drinkers and the general population (Fox, Hong & Sinha, 2008; Fox et al., 2007).

### *Trauma, Addiction and Deprivation*

Around two thirds of people (67.8%) who completed the study met criteria for PTSD which is higher than the average figures of 30-60% quoted in the literature (Back, 2010; Brady, Back & Coffey, 2004). There may be several reasons for this higher incidence. Firstly, along with high trauma rates, around 90% of the respondents lived in areas of high deprivation. Various studies have looked at the effect poverty has on mental health (Rehkopf & Buka, 2006; Gunnell, Peters, Kannerling & Brooks, 1995) and having poor mental health makes it more difficult to sustain employment (Jenkins et al., 2008). Living in poverty can lead to chronic conditions of high stress (Collins et al., 2010) and children who are born in deprivation are at greater risk of having a parent who misuses substances, witnessing violence, and having disrupted attachments (Evans & English, 2002). There is a well-defined link between children having a parent who misuses alcohol or drugs and then developing an addiction in adulthood (Fergusson, Boden & Horwood, 2008; Nation & Heflinger, 2006). Having a family history of alcoholism also predicts poor emotional regulation in substance users (de Haan et al., 2013). Being able to establish whether living in poverty is a consequence of trauma and addiction or whether addiction and trauma are consequences of poverty is impossible to determine in this sample. However, given the high rates of trauma and deprivation reported it may have been useful to examine type of trauma. Due to ethical considerations, participants did not disclose what traumatic event they were referring to when completing the IES. It may have been worthwhile to look at complex trauma to get more of an understanding of the type of trauma people had

experienced and whether this impacted their experience of addiction and emotional regulation.

As well as the effects of trauma and deprivation on the development of addiction, people with addictions experience more stigma and social exclusion than most groups in society. One theory of addiction proposed over the last few years has been to view addiction not as a medical problem but as a consequence of social isolation. March, Oviedo-Joekes and Romero (2006) looked at drug addiction and social exclusion in a large study spanning ten European cities. They found that social exclusion exacerbates drug use and poor mental health. It may be that the high levels of social deprivation found in the study could be partly explained by the idea that social exclusion is a risk factor for development and maintenance of addictions.

#### *Self-Medication, Trauma and Addiction*

The findings from this study fits partially with Schafer et al. (2010) findings that high DES scores were prevalent in polysubstance inpatients. However, the mean scores for all groups in this study were higher than what they reported. Somer (2003) proposed that people with misuse drugs do so as a strategy to cope with painful memories and experiences. He suggested that when attempts at coping fail or are ineffective, other ways of distancing psychological distress are sought. This can result in people using alcohol and drugs to produce a chemical numbing and dissociation. This may be particularly relevant when people have poor emotional regulation skills or find recognising emotions problematic (Fernandez-Serrano, Loranzo, Perez-Garcia & Verdejo-Garcia, 2010). Somer & Avni (2003) have also proposed that when psychological dissociation is not effective and people need further ways of distancing themselves from the sequelae of trauma, this is when substance use becomes self-medication. Khantzian (1977) first proposed that addiction be viewed as an attempt at self-medicating around 40 years ago and a considerable amount of research has been conducted in that time. The original idea was based in psychoanalytic tradition and has sound criticism due to its proposition that negative affect and aggression in addiction arise from inadequate ego mechanism and that all people with addiction share the same personality traits (Hall & Queener, 2007). More recent adaptations to the theory consider that AUD and SUD are the result of poor affect

regulation, low self-esteem and poor self-care (Khantzian, 1990). However, despite the limitations of the theory clinical observations have noted that one of the reasons given for AUD and SUD is to relieve negative feelings (Weiss, Griffin & Mirin, 1992; Voruganti, Heslegrave & Awad, 1997). The high co-morbidity of mental health problems and addiction is also proposed as evidence for the self-medication theory. In the current study this may be a factor in accounting for the high levels of trauma, emotional dysregulation and dissociation found.

### **3.7.1 Limitations**

Self-report was relied on for not only the measures chosen but for whether participants had misused alcohol or drugs in the two weeks prior to completing the questionnaires. It would have been more reliable to use chemical testing such as urine analysis to ensure that the scores on the measures were not the result of intoxication or withdrawal. However, it was out with the scope of the study to be able to do that.

There was no measure of addiction severity included in the study which means that severity and how it relates to type of addiction, trauma, emotional regulation, alexithymia and dissociation was not assessed. There was also no assessment of other mental health problems, in particular, anxiety and depression. Previous research has found that anxiety and depression can affect scores on the TAS-20 (Marchesi, Ossola, Tonna & De Panfilis, 2014). If this research was to be replicated a measure of severity and also depression and anxiety should be included.

Future studies should aim to develop the current finding as it was found that emotional regulation, alexithymia and dissociation all had important relationships with PTSD and addiction. Research should extend to looking at whether investigating chronic and complex PTSD in this population add to our understanding of the relationship between the investigated variables and severity of addiction. The variables investigated are common symptoms in complex PTSD (Herman, 1992; Ford et al., 2007). Therefore, it would be informative to understand whether emotional regulation, alexithymia and dissociation mediate the relationships between complex PTSD and addiction.

### **3.7.2 Conclusions**

Overall, the study did not find any differences between AUD, SUD and polysubstance misuse and experiences of trauma. There were also no differences between groups in prevalence of alexithymia or emotional regulation. The study did find that the polysubstance group had significantly higher level of dissociation than the other two groups. Overall, the sample had a high proportion of trauma at 67.8% and this was slightly higher than has been reported in the literature. Multiple regression analysis found that emotional regulation, alexithymia and dissociation could predict 49% of the variance of trauma when the whole dataset was pooled. This has added to understanding about the relationships between poor emotional regulation, alexithymia and dissociation commonly co-occur with PTSD so it may be important for clinicians to understand this and to routinely screen for these difficulties when treating people with PTSD who have co-morbid addictions. The study also found that levels of deprivation as measured on the SIMD were also high with around 90% of respondents reported living in areas of high deprivation. Therefore, clinicians must have an understanding not only of the psychological difficulties people with addictions face but the socio-economic problems which can compound their distress.

### 3.8 References

- Azizi, A., Borjali, A. & Mahmoud Golzari, M. (2010). The effectiveness of emotion regulation training and cognitive therapy on the emotional and addictional problems of substance abusers. *Iranian Journal of Psychiatry*, 5, 60-65.
- Back, S.E. (2010). Toward an improved model of treating co-occurring PTSD and substance use disorders. *American Journal of Psychiatry*, 167, 11–13.
- Brady, K.T., Back, S.E. & Coffey, S.F. Substance abuse and posttraumatic stress disorder. *Current Directions in Psychological Science*.
- Brady, K.T., Dansky, B.S., Sonne, S.C. & Saladin, M.E. (1998). Posttraumatic stress disorder and cocaine dependence. Order of onset. *American Journal of Addiction*, 7, 128–135.
- Berenbaum, H. & James, T. (1994). Correlates and retrospectively reported antecedents of alexithymia. *Psychosomatic Medicine*, 56, 353-359.
- Berenbaum, H. (1996). Childhood abuse, alexithymia and personality disorder. *Journal of Psychosomatic Research*, 41, 585-595.
- Bermond, B., Moormann, P.P., Albach, F. & van Dijke, A. (2008). Impact of severe childhood sexual abuse on the development of alexithymia in adulthood. *Psychotherapy Psychosomatic*, 77, 260-262.
- Briere, J. (2006). Dissociative symptoms and trauma exposure: Specificity, affect dysregulation and posttraumatic stress. *Journal of Nervous and Mental Disorders*, 194, 78–82.
- Bujarski, S. J., Klanecky, A. K. & McChargue, D. E. (2010). The relationship between alexithymia and alcohol-related risk perceptions: The moderating effect of general trauma in a college population. *Addictive Behaviors*, 35, 363–366.
- Cleland, C., Magura, S., Foote, J., Rosenblum, A. & Kosanke, N. (2005). Psychometric properties of the Toronto alexithymia scale (TAS-20) for substance users. *Journal of Psychosomatic Research*, 58, 299–306.
- Collins, K., Connors, K., Davis, S., Donohue, A., Gardner, S., Goldblatt, E., Hayward, A., Kiser, L., Strieder, F. Thompson, E. (2010). *Understanding the impact of trauma and urban poverty on family systems: Risks, resilience, and interventions*. Baltimore, MD: Family Informed Trauma Treatment Center.
- Dansky, B.S., Roitzsch, J.C., Brady, K.T., & Saladin, M. E. (1997). Posttraumatic stress disorder and substance abuse: Use of research in a clinical setting. *Journal of Trauma and Stress*, 10, 141–148.

Darke, S. (2013). Pathways to heroin dependence: time to re-appraise self-medication. *Addiction, 108*, 659–667.

de Haan, H. A., Joosten, E., de Haan, L., Schellekens, A. F., Buitelaar, J. K., van der Palen, C., De Jong, A. J. (2013). A family history of alcoholism relates to alexithymia in substance use disorder patients. *Comprehensive Psychiatry, 54*, 911–917.

Driessen, M., Schulte, S., Luedecke, C., Schaefer, I., Sutmann, F., Ohlmeier, M., Kemper, U., Koesters, G., Chodzinski, C., Schneider, U., Broese, T., Dette, C. & Havemann-

Evans, G.W. & English, K. (2002). The environment of poverty: Multiple stressor exposure, psychophysiological stress, and socioemotional adjustment. *Child Development, 73*, 1238-1248.

Evren, C., Kose S., Sayar, K., Ozcelik, B., Porckardt, J. P., Elhai, J.D. (2008). Alexithymia and temperament and character model of personality in alcohol-dependent Turkish men. *Psychiatry and Clinical Neurosciences, 62*, 371-378.

Evren, C., Sar, V., Evren, B., Semiz, U., Dalbudak, E. & Cakmak, D. (2008). Dissociation and alexithymia among men with alcoholism. *Psychiatry and Clinical Neurosciences, 62*, 40-47.

Fergusson, D., M., Boden, J., M. & Horwood, L. J. (2008). The developmental antecedents of illicit drug use: Evidence from a 25-year longitudinal study. *Drug and Alcohol Dependence, 96*, 165–177.

Fernández-Serrano, M., Óscar Lozano, O., Pérez-García, M. & Antonio Verdejo-García, A. (2010). Impact of severity of drug use on discrete emotion recognition in polysubstance abusers. *Drug and Alcohol Dependence, 109*, 57-64.

Ford, J.D., Hawke, J., Alessi, S., Ledgerwood, D., & Petry, N. (2007). Psychological trauma and PTSD symptoms as predictors of substance dependence treatment outcome. *Behaviour Research and Therapy, 45*, 2417–2431.

Fox, H. C., Axelrod, S. R., Paliwal, P., Sleeper, J. & Sinha, R. (2007). Difficulties in emotional regulation and impulse control during cocaine abstinence. *Drug and Alcohol Dependence, 89*, 234-238.

Fox, H. C., Hong, K. A. & Sinha, R. (2008). Emotional regulation and impulse control in recently abstinent alcoholics compared with social drinkers. *Addictive Behaviours, 33*, 388-394.

Gunnell, D. J., Peters T., Kammerling, R.M. & Brooks, B. (1995). Relation between parasuicide, suicide, psychiatric admissions, and socioeconomic deprivation. *British Medical Journal 311*, 226-30.

- Gratz, K.L. & Roemer, E. (2004). Multidimensional Assessment of Emotion Regulation and Dysregulation: Development, Factor Structure, and Initial Validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment*, 26, 41-54.
- Hall, D. H & Queener, J. E. (2007). Self-medication hypothesis of substance use: testing Khantzian's updated theory. *Journal of Psychoactive Drugs*, 39, 151-158.
- Herman, J.L. (1992). Complex PTSD: A syndrome in survivors of prolonged and repeated trauma. *Journal of Traumatic Stress*, 3, 377-391.
- Jenkins, R. D., Bhugra, P., Bebbington, T., Brugha, M., Farrell, J., Coid, T., Fryers, S., Weich, N., Singleton, P. & Meltzer, H. (2008) Debt, income and mental disorder in the general population. *Psychological Medicine* 38, 1485-93.
- Kessler, R.C., Chiu, W.T., Demler, O., Merikangas, K.R., & Walters, E.E. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 62, 617-627.
- Khantzian, E. J. (1990). Self-regulation and self-medication factors in alcoholism and the addictions. Similarities and differences. *Recent Developments in Alcoholism*, 8, 255-271.
- Khantzian, E. J. (1977). The ego, the self, and opiate addiction: theoretical and treatment considerations. *National Institute of Drug Addiction*, 12, 101-117.
- Loas, G., Fremaux, D., Otmani, O., Lecercle, C & Delahousse, J. (1997). Is alexithymia a negative factor in maintaining abstinence? A follow-up study. *Comprehensive Psychiatry*, 38, 296-299.
- Najavits, L. & Walsh, M. (2012). Dissociation, PTSD, and Substance Abuse: An Empirical Study. *Journal of Trauma and Dissociation*, 13, 115-126.
- Nation, M.; Heflinger, C. A. (2006). Risk Factors for Serious Alcohol and Drug Use: The Role of Psychosocial Variables in Predicting the Frequency of Substance Use Among Adolescents. *The American Journal of Drug and Alcohol Abuse*, 23, 231-234.
- Marchesi C., Ossola, P., Tonna, M. & De Panfilis, C. (2014). The TAS-20 more likely measures negative affects rather than alexithymia itself in patients with major depression, panic disorder, eating disorders and substance use disorders. *Comprehensive Psychiatry*, 55, 972-978.
- Miller, W. R., Forchimes, A. A., & Zweben, A. (2011). *Treating addiction: A guide for professionals*. New York: Guilford.
- Pombo, S., Félix da Costa, N., Ismail, F., Neves, J. M., Figueira, C., & Figueira, M. L. (2015) Alexithymia and alcohol dependence: Do different subtypes manifest different

emotion regulations?, *Addiction Research & Theory*, 23, 187-195.

Rehkopf, D.H. & Buka S L. (2006) The association between suicide and the socio-economic characteristics of geographical areas: a systematic review. *Psychological Medicine*, 36, 145-57.

Reinicke, U. (2008). Trauma and PTSD in Patients with Alcohol, Drug, or Dual Dependence: A Multi-Center Study. *Alcoholism: Clinical and Experimental Research*, 32, 481-489.

Sauvage, L. & Loas, G. (2006). Criterion validity of Bermond-Vorst Alexithymia Questionnaire-20 form B: A study of 63 alcoholic subjects. *Psychological Reports*, 98, 234-236.

Schäfer, I., Langeland, W., Hissbach, J., Luedecke, C., Ohlmeier, M.D. & Chodzinski, C. (2010). Childhood trauma, dissociation and posttraumatic stress disorder in patients with alcohol dependence, drug dependence or both - a multi-center study. *Drug and Alcohol Dependence*, 109, 84-89.

Scottish Index of Multiple Deprivation. (2016). <http://www.gov.scot/Topics/Statistics/SIMD>. Accessed in January 2017.

Somer, E. (2003). Prediction of abstinence from heroin addiction by childhood trauma, dissociation, and extent of psychosocial treatment. *Addiction Research and Theory*, 11, 339-4

Somer E. & Avni, R.(2003). Dissociative phenomena among recovering heroin users and their relationship to duration of abstinence. *Journal of Social Work Practice in Addiction*, 3, 25-38.

Stasiewicz, P.R., Bradizza, C.M., Gudleski, G.D., Coffey, S.F., Schlauch, R.C., Bailey, S.T., Bole, C.W. & Gulliver, S.B. (2012). The relationship of alexithymia to emotional dysregulation within an alcohol dependent treatment sample. *Addictive Behaviors* 37, 469-476.

Taylor, G. J., Parker, J. D. A., & Bagby, R. M. (2003). The twenty-item Toronto Alexithymia Scale-IV. Cross-cultural validity and reliability. *Journal of Psychosomatic Research*, 55, 277-283

Van Ijzendoorn, M. H. & Schuengel, C. (1996). The measurement of dissociation in normal and clinical populations: meta-analytic validation of the dissociative experiences scale (DES). *Clinical Psychology Review*, 16, 365-382.

Voruganti, L. N. P., Heslegrave, R. J. & Awad, A. G. (1997). Neuroleptic dysphoria may be the missing link between schizophrenia and substance abuse. *Journal of nervous and Mental Disorders*, 185, 463-465.

Weiss, R. D., Griffin, M. L. & Mirin, S. M. (1992). Drug abuse as self-medication for depression: an empirical study. *American Journal of Drug and Alcohol Abuse*, 18, 121-129.

Whitaker, L. R., Degoulet, M. & Morikawa, H. (2013). Social deprivation enhances VTA synaptic plasticity and drug induced contextual learning. *Neuron*, 77, 335-345.

Ziolkowski, M. Gruss, T. & Rybakowski J, K. (1995). Does alexithymia in male alcoholics constitute a negative factor for maintaining abstinence. *Psychotherapy and Psychosomatics*, 63, 169-73.

#### 4.1 All References

American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders, 4th ed.* Washington, DC: American Psychiatric Association.

Azizi, A., Borjali, A. & Mahmoud Golzari, M. (2010). The effectiveness of emotion regulation training and cognitive therapy on the emotional and addictional problems of substance abusers. *Iranian Journal of Psychiatry, 5*, 60-65.

Back, S.E. (2010). Toward an improved model of treating co-occurring PTSD and substance use disorders. *American Journal of Psychiatry, 167*, 11–13.

Bagby, R. M., Taylor, G. J. & Parker, J. D. A. (1994). The Twenty-Item Toronto Alexithymia Scale -- II. Convergent, discriminant and concurrent validity. *Journal of Psychosomatic Research, 38*, 33-40.

Bagby, R. M., Taylor, G. J. & Parker, J. D. A. & Dickens, S.E. (2006). The development of the Toronto Structured Interview for Alexithymia: item selection, factor structure, reliability and concurrent validity. *Psychotherapy and Psychosomatics, 75*, 25-39.

Brady, K.T., Back, S.E. & Coffey, S.F. Substance abuse and posttraumatic stress disorder. *Current Directions in Psychological Science*.

Berenbaum, H. & James, T. (1994). Correlates and retrospectively reported antecedents of alexithymia. *Psychosomatic Medicine, 56*, 353-359.

Berenbaum, H. (1996). Childhood abuse, alexithymia and personality disorder. *Journal of Psychosomatic Research, 41*, 585-595.

Bermond, B., Moormann, P.P., Albach, F. & van Dijke, A. (2008). Impact of severe childhood sexual abuse on the development of alexithymia in adulthood. *Psychotherapy Psychosomatic, 77*, 260-262.

Briere, J. (2006). Dissociative symptoms and trauma exposure: Specificity, affect dysregulation and posttraumatic stress. *Journal of Nervous and Mental Disorders, 194*, 78–82.

Bujarski, S. J., Klanecky, A. K. & McChargue, D. E. (2010). The relationship between alexithymia and alcohol-related risk perceptions: The moderating effect of general trauma in a college population. *Addictive Behaviors, 35*, 363–366.

Cameron, K., Ogrodniczuk, J. & Hadjipavlou, G. (2014). Changes in alexithymia following psychological intervention: a review. *Harvard Review of Psychiatry, 22*, 162-178.

Carton, C., Bayard, S., Paget, V., Jouanne, C., Varescon, I., Edel, Y. & Deltilleux, M.

(2010). Emotional awareness in substance-dependent patients. *Journal of Clinical Psychology*, *66*, 599-610.

Cleland, C., Magura, S., Foote, J. Rosenblum, A. & Kosanke, N. (2005). Psychometric properties of the Toronto Alexithymia Scale (TAS-20) for substance users. *Journal of Psychosomatic Research*, *58*, 299–306

Cochrane, C. E., Brewerton, T. D., Wilson, D. B. & Hodges, E. L. (1993). Alexithymia in the eating disorders. *The International Journal of Eating Disorders*, *14*, 219–22.

Collins, K., Connors, K., Davis, S., Donohue, A., Gardner, S., Goldblatt, E., Hayward, A., Kiser, L., Strieder, F. Thompson, E. (2010). *Understanding the impact of trauma and urban poverty on family systems: Risks, resilience, and interventions*. Baltimore, MD: Family Informed Trauma Treatment Center.

Conway, K.P., Compton, W., Stinson, F.S. & Grant, B.F. (2006). Lifetime comorbidity of DSM-IV mood and anxiety disorders and specific drug use disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry*, *67*, 247–257.

Cox ,B. J., Swinson, R.P., Shulman, I.D. & Bourdeau, D. (1995). Alexithymia in panic disorder and social phobia. *Comprehensive Psychiatry*, *36*, 195–8.

Darke, S. (2013). Pathways to heroin dependence: time to re-appraise self-medication. *Addiction*, *108*, 659–667.

Dansky, B.S., Roitzsch, J.C., Brady, K.T., & Saladin, M. E. (1997). Posttraumatic stress disorder and substance abuse: Use of research in a clinical setting. *Journal of Trauma and Stress*, *10*, 141–148.

Deeks, J., Dinnes, J., D’AMico, R., Sowden, A., Sakarovitch, C., Song, F., Pettigrew, M. & Altman, D. G. (2003). Evaluating non-randomised intervention studies, *Health Technology Assessment*, *7*, 1-173.

de Haan, H.A., Joosten, E.A.G., Wijdeveld, A.G.M., Boswinkel, P., van der Palen., J. & De Jong, C.A.J. (2012a). Alexithymia is not a stable personality trait in patients with substance use disorders. *Psychiatry Research* *198*, 123–129.

de Haan, H.A., Schellekens, A.F., van der Palen, J., Verkes, R.J., Buitelaar, J.K. & De Jong, C.A. (2012b). The level of alexithymia in alcohol-dependent patients does not influence outcomes after inpatient treatment. *American Journal of Drug and Alcohol Abuse*, *38*, 299–3

de Haan, H. A., Joosten, E., de Haan, L., Schellekens, A. F., Buitelaar, J. K., van der Palen, C., De Jong, A.. J. (2013). A family history of alcoholism relates to alexithymia in substance use disorder patients. *Comprehensive Psychiatry*, *54*, 911–917. .

de Haan H. A., van der Palen J., Toon G.M. Wijdeveld G. M., Jan K. Buitelaar J. K. & De Jong, C. J. (2014). Alexithymia in patients with substance use disorders: State or trait? *Psychiatry Research*, 216, 137-145.

Downs, S.H., & Black, N. (1998). The feasibility of creating a checklist for the assessment of the methodological quality both of randomized and non-randomized studies of health care interventions. *Journal of Epidemiology Community Health*, 52, 377-384.  
and anxiety. *Psychiatry Research* 157, 105–113.

Driessen, M., Schulte, S., Luedecke, C., Schaefer, I., Sutmann, F., Ohlmeier, M., Kemper, U., Koesters, G., Chodzinski, C., Schneider, U., Broese, T., Dette, C. & Havemann-Reinicke, U. (2008). Trauma and PTSD in Patients with Alcohol, Drug, or Dual Dependence: A Multi-Center Study. *Alcoholism: Clinical and Experimental Research*, 32, 481-489.

Evans, G.W. & English, K. (2002). The environment of poverty: Multiple stressor exposure, psychophysiological stress, and socioemotional adjustment. *Child Development*, 73, 1238-1248.

Evren, C., Kose S., Sayar, K., Ozcelik, B., Porckardt, J. P., Elhai, J.D. (2008). Alexithymia and temperament and character model of personality in alcohol-dependent Turkish men. *Psychiatry and Clinical Neurosciences*, 62, 371-378.

Evren, C., Sar, V., Evren, B., Semiz, U., Dalbudak, E. & Cakmak, D. (2008). Dissociation and alexithymia among men with alcoholism. *Psychiatry and Clinical Neurosciences*, 62, 40-47.

Fergusson, D., M., Boden, J., M. & Horwood, L. J. (2008). The developmental antecedents of illicit drug use: Evidence from a 25-year longitudinal study. *Drug and Alcohol Dependence*. 96, 165–177.

Fernández-Serrano, M., Óscar Lozano, O., Pérez-García, M. & Antonio Verdejo-García, A. (2010). Impact of severity of drug use on discrete emotion recognition in polysubstance abusers. *Drug and Alcohol Dependence*, 109, 57-64.

Fox, H. C., Axelrod, S. R., Paliwal, P., Sleeper, J. & Sinha, R. (2007). Difficulties in emotional regulation and impulse control during cocaine abstinence. *Drug and Alcohol Dependence*, 89, 234-238.

Fox, H. C., Hong, K. A. & Sinha, R. (2008). Emotional regulation and impulse control in recently abstinent alcoholics compared with social drinkers. *Addictive Behaviours*, 33, 388-394.

Gunnell, D. J., Peters T., Kammerling, R.M. & Brooks, B. (1995). Relation between parasuicide, suicide, psychiatric admissions, and socioeconomic deprivation. *British Medical Journal* 311, 226-30.

- Gratz, K.L. & Roemer, E. (2004). Multidimensional Assessment of Emotion Regulation and Dysregulation: Development, Factor Structure, and Initial Validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment*, 26, 41-54.
- Hall, D. H & Queener, J. E. (2007). Self-medication hypothesis of substance use: testing Khantzian's updated theory. *Journal of Psychoactive Drugs*, 39, 151-158.
- Hamidi, S., Rostami, R., Farhoodi, F. & Abdolmanafi, A. (2010). A study and comparison of Alexithymia among patients with substance use disorder and normal people. *Procedia Social and Behavioral Sciences*, 5, 1367–137.
- Haviland, M. G., Warren, W. L. & Riggs, M. L. (2000). An observer scale to measure alexithymia. *Psychosomatics*, 41, 385-392.
- Hintikka J., Honkalampi K., Koivumaa-Honkanen H., Antikainen R., Tanskanen A., Haatainen K., et al. (2004). Alexithymia and suicidal ideation: a 12-month follow-up study in a general population. *Comprehensive Psychiatry*, 45, 340–345.
- Honkalampi K., Hintikka J., Tanskanen A., Lehtonen J. & Viinamäki H. (2000). Depression is strongly associated with alexithymia in the general population. *Journal of Psychosomatic Research*, 48, 99–104.
- Jenkins, R. D., Bhugra, P., Bebbington, T., Brugha, M., Farrell, J., Coid, T., Fryers, S., Weich, N., Singleton, P. & Meltzer, H. (2008) Debt, income and mental disorder in the general population. *Psychological Medicine* 38, 1485-93.
- Keller, D.S., Carroll, K.M., Nich, C. & Rounsaville, B.J. (1995). Alexithymia in cocaine abusers: response to psychotherapy and pharmacotherapy. *American Journal of Addiction*, 4, 234–44.
- Kessler, R.C., Chiu, W.T., Demler, O., Merikangas, K.R., & Walters, E.E. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 62, 617-627.
- Khantzian, E. J. (1990). Self-regulation and self-medication factors in alcoholism and the addictions. Similarities and differences. *Recent Developments in Alcoholism*, 8, 255-271.
- Khantzian, E. J. (1977). The ego, the self, and opiate addiction: theoretical and treatment considerations. *National Institute of Drug Addiction*, 12, 101-117.
- Kim, J.H., Lee, S.J., Rim, H.D., Kim, H.W., Bae, G.Y. & Chang, S.M. (2008). "The Relationship between Alexithymia and General Symptoms of Patients with Depressive Disorders". *Psychiatry Investigation*, 5, 179–85.

Kopera, M., Jakubczyk, A., Suszek, H., Glass, J. M., Klimkiewicz A., Wnorowska K. J. & Wojnan, M. (2014). Relationship Between Emotional Processing, Drinking Severity and Relapse in Adults Treated for Alcohol Dependence in Poland. *Alcohol and Alcoholism* 50, 173–179.

Lane R. D. (2008). Neural substrates of implicit and explicit emotional processes: a unifying framework for psychosomatic medicine. *Psychosomatic Medicine*, 70, 214–231.

Leising, D., Grande, T. & Faber, R. (2009). The Toronto Alexithymia Scale (TAS-20): a measure of general psychological distress. *Journal of Research in Personality*, 43, 707-710.

Loas, G., Fremaux, D., Otmani, O., Lecercle, C. & Delahousse, J. (1997). Is alexithymia a negative factor for maintaining abstinence? A follow- up study. *Comprehensive Psychiatry*, 38, 296–9.

Luminet, O. Bagby, R.M. & Taylor, G.J. (2001). An evaluation of the absolute and relative stability of alexithymia in patients with major depression. *Psychotherapy and Psychosomatics*, 70, 254-260.

Lyvers, M., Onuoha, R., Thorberg, F. & Samios, C. (2011). Alexithymia in relation to parental alcoholism, everyday frontal lobe functioning and alcohol consumption in a non-clinical sample. *Addictive Behaviours*, 37, 205-210.

Marchesi, C. (2015). How useful is the construct of alexithymia for understanding the risk of mental disorders. *Acta Psychopathologica*, 2, 73-76.

Marchesi C., Ossola, P., Tonna, M. & De Panfilis, C. (2014). The TAS-20 more likely measures negative affects rather than alexithymia itself in patients with major depression, panic disorder, eating disorders and substance use disorders. *Comprehensive Psychiatry*, 55, 972-978.

Miller, W. R., Forchimes, A. A., & Zweben, A. (2011). *Treating addiction: A guide for professionals*. New York: Guilford.

Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement*. <http://www.prisma-statement.org> (accessed January 2017).

Morie, K. P., Nich, C., Hunkele, K., Potenza, M. N. & Carroll, K. M. (2015). Alexithymia level and response to computer-based training in cognitive behavioral therapy among cocaine-dependent methadone maintained individuals. *Drug Alcohol Dependence*, 152, 157–163.

Najavits, L. & Walsh, M. (2012). Dissociation, PTSD, and Substance Abuse: An Empirical Study. *Journal of Trauma and Dissociation*, 13, 115-126.

Nation, M.; Heflinger, C. A. (2006). Risk Factors for Serious Alcohol and Drug Use: The Role of Psychosocial Variables in Predicting the Frequency of Substance Use Among Adolescents. *The American Journal of Drug and Alcohol Abuse*, 23, 231-234.

National Institute for Health and Clinical Excellence. (2007). *Drug Misuse: Psychosocial Intervention. Clinical Guideline 51*, NICE: London.

National Institute for Health and Clinical Excellence. (2011). *Alcohol-use disorders Diagnosis, assessment and management of harmful drinking and alcohol dependence. Clinical Guideline 115*. NICE: London.

Ogrodniczuk J. S., Piper W. E. & Joyce A. S. (2011). Effect of alexithymia on the process and outcome of psychotherapy: a programmatic review. *Psychiatry Research*, 190, 43–48.

Ogrodniczuk J. S., Piper W. E. & Joyce A. S. (2013). Change in alexithymia in two dynamically informed individual psychotherapies. *Psychotherapy and Psychosomatics*, 82, 61-63.

Olmunen, T., Lehto, S. M., Heliste, M., Kurl, S. & Kauhanen, J. (2010). Alexithymia is associated with increased cardiovascular mortality in middle-aged Finnish men. *Psychosomatic Medicine*, 72, 187–191.

Parker, J.D.A., Keefer, K.V., Taylor, G.J. & Bagby, R.M. (2008). Latent structure of the alexithymia construct: a taxometric investigation. *Psychological Assessment*, 20, 385-96.

Parker, J. D.A., Taylor, G. J. & Bagby, R. M. (2001). The Relationship Between Emotional Intelligence and Alexithymia. *Personality and Individual Differences*. 30, 107–115.

Pombo, S., Félix da Costa, N., Ismail, F., Neves, J. M., Figueira, C., & Figueira, M. L. (2015) Alexithymia and alcohol dependence: Do different subtypes manifest different emotion regulations?, *Addiction Research & Theory*, 23, 187-195.

Rehkopf, DH. & Buka S L. (2006) The association between suicide and the socio-economic characteristics of geographical areas: a systematic review. *Psychological Medicine*, 36, 145-57.

Rosenblum, A., Foote, J., Cleland, C., Magura, S., Mahmood, D., & Kosanke, N. (2005). Moderators of effects of motivational enhancements to cognitive behavioral therapy. *The American Journal of Drug and Alcohol Abuse*, 31, 35–58.

Saarijärvi, S., Salminen, J.K. & Toikka, T.B. (2006). Temporal stability of alexithymia over a five-year period in outpatients with major depression. *Psychotherapy and Psychosomatics*, 75, 107-112.

Salminen J. K., Saarijärvi S., Äärelä E., Toikka T., & Kauhanen J. (1999). Prevalence of alexithymia and its association with sociodemographic variables in the general population of Finland. *Journal of Psychosomatic Research*, *1*, 75–82.

Samur, D., Tops, M., Schlinkert, C., Cuijpers, P., & Koole, S. L. (2013). Four decades of research on alexithymia: moving toward clinical applications. *Frontiers of Psychology*, *4*, 861-868.

Sauvage, L. & Loas, G. (2006). Criterion validity of Bermond-Vorst Alexithymia Questionnaire-20 form B: A study of 63 alcoholic subjects. *Psychological Reports*, *98*, 234-236.

Schäfer, I., Langeland, W., Hissbach, J., Luedecke, C., Ohlmeier, M.D. & Chodzinski, C. (2010). Childhood trauma, dissociation and posttraumatic stress disorder in patients with alcohol dependence, drug dependence or both - a multi-center study. *Drug and Alcohol Dependence*, *109*, 84-89.

Scottish Index of Multiple Deprivation. (2016). <http://www.gov.scot/Topics/Statistics/SIMD>. Accessed in January 2017.

Scottish Intercollegiate Guidelines Network. (2008). SIGN 50: A guideline developer's handbook. <http://www.sign.ac.uk/pdf/sign50.pdf> (accessed December 2016).

Sifneos P. E. (1973). The prevalence of 'alexithymic' characteristics in psychosomatic patients. *Psychotherapy and Psychosomatics*, *22*, 255–262.

Somer, E. (2003). Prediction of abstinence from heroin addiction by childhood trauma, dissociation, and extent of psychosocial treatment. *Addiction Research and Theory*, *11*, 339-4

Somer E. & Avni, R.(2003). Dissociative phenomena among recovering heroin users and their relationship to duration of abstinence. *Journal of Social Work Practice in Addiction*, *3*, 25-38.

Stasiewicz, P.R., Bradizza, C.M., Gudleski, G.D., Coffey, S.F., Schlauch, R.C., Bailey, S.T., Bole, C.W. & Gulliver, S.B. (2012). The relationship of alexithymia to emotional dysregulation within an alcohol dependent treatment sample. *Addictive Behaviors* *37*, 469–476.

Taylor G. J., & Bagby R. M. (2013). Psychoanalysis and empirical research: an example of alexithymia. *Journal of Psychoanalytic Association*, *61*, 99-133.

Taylor, G.J., Bagby, R.M., & Parker, J.D.A. (1997). *Disorders of affect regulation: alexithymia in medical and psychiatric illness*. Cambridge University Press: Cambridge.

Taylor, G. J., Bagby, M.R., Parker, J.D.A. (1999). Disorders of Affect Regulation: Alexithymia in *Medical and Psychiatric Illness*. Cambridge: Cambridge University Press.

Taylor, G. J., Parker, J. D. A., & Bagby, R. M. (2003). The twenty-item Toronto Alexithymia Scale-IV. Cross-cultural validity and reliability. *Journal of Psychosomatic Research, 55*, 277-283

Timary, P., Luts, A., Hers, D., & Luminet, O. (2008). Absolute and relative stability of alexithymia in alcoholic inpatients undergoing alcohol withdrawal: Relationship to depression and anxiety. *Psychiatry Research, 157*, 105–113.

Van Ijzendoorn, M. H. & Schuengel, C. (1996). The measurement of dissociation in normal and clinical populations: meta-analytic validation of the dissociative experiences scale (DES). *Clinical Psychology Review, 16*, 365-382.

Voruganti, L. N. P., Heslegrave, R. J. & Awad, A. G. (1997). Neuroleptic dysphoria may be the missing link between schizophrenia and substance abuse. *Journal of nervous and Mental Disorders, 185*, 463-465.

Weiss, R. D., Griffin, M. L. & Mirin, S. M. (1992). Drug abuse as self-medication for depression: an empirical study. *American Journal of Drug and Alcohol Abuse, 18*, 121-129.

Whitaker, L. R., Degoulet, M. & Morikawa, H. (2013). Social deprivation enhances VTA synaptic plasticity and drug induced contextual learning. *Neuron, 77*, 335-345.

Ziolkowski, M. Gruss, T. & Rybakowski J, K. (1995). Does alexithymia in male alcoholics constitute a negative factor for maintaining abstinence. *Psychotherapy and Psychosomatics, 63*, 169–73.

## 5.1 APPENDIX A: Approval letter from IRAS Ethics Committee



West of Scotland Research Ethics Service

Ms Claire Stark Trainee Clinical Psychologist NHS Lanarkshire Wishaw/ Motherwell CAHMS  
Services Airbles Road Motherwell ML1 2TJ

### West of Scotland REC 4

West Ambulatory Care Hospital Dalnair Street Yorkhill Glasgow

Dear Ms Stark

**Study title: Trauma, Emotional Regulation, Alexithymia and Dissociation in Alcohol  
Dependence, Drug Dependence and Both**

**REC reference: 16/WS/0072**

**Protocol number: AC16014**

**IRAS project ID: 190505**

Thank you for your letter of 09 May 2106, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information was considered in correspondence by a Sub-Committee of the REC. A list of the Sub-Committee members is attached.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details. Publication will be no earlier than three months from the date of this opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to make a request to postpone publication, please contact the REC Assistant Co-ordinator, Miss Sophie Bagnall, [wosrec4@ggc.scot.nhs.uk](mailto:wosrec4@ggc.scot.nhs.uk)

### Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

### Conditions of the favourable opinion

The REC favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission must be obtained from each host organisation prior to the start of the study at the site concerned. *Management permission should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.*

Each NHS organisation must confirm through the signing of agreements and/or other documents that it has given permission for the research to proceed (except where explicitly specified otherwise).

Guidance on applying for NHS permission for research is available in the Integrated Research Application System, [www.hra.nhs.uk](http://www.hra.nhs.uk) or at <http://www.rdforum.nhs.uk>.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity. For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation. Sponsors are not required to notify the Committee of management permissions from host organisations

### Registration of Clinical Trials

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publically accessible database within 6 weeks of recruitment of the first participant (for medical device studies, within the timeline determined by the current registration and publication trees).

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g. when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non-clinical trials this is not currently mandatory.

If a sponsor wishes to contest the need for registration they should contact Catherine Blewett ([catherineblewett@nhs.net](mailto:catherineblewett@nhs.net)), the HRA does not, however, expect exceptions to be made. Guidance on where to register is provided within IRAS.

**It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).**

### Ethical review of research sites

#### NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

<i>Document</i>	<i>Version</i>	<i>Date</i>
Covering letter on headed paper [cover letter]		03 March 2016
Covering letter on headed paper [cover letter]		09 May 2016

Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Sponsor insurance documents ]		13 July 2015
Participant consent form [Consent Form]	v1.2	09 May 2016
Participant information sheet (PIS) [Participant Information Sheet]	V1.2	27 April 2016
REC Application Form [REC_Form_04032016]		03 March 2016
Referee's report or other scientific critique report [Academic Critique]		29 July 2015
Research protocol or project proposal [Research Protocol V1.1]	V1.1	02 March 2016
Summary CV for Chief Investigator (CI) [Summary CV for CI V1.1]		02 March 2016
Summary CV for supervisor (student research) [Summary CV for Supervisor V1.1]		02 March 2016
Validated questionnaire [Questionnaire Pack V1.1]	V1.1	11 March 2016

### Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

### Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

### After ethical review

#### Reporting requirements

The attached document "*After ethical review – guidance for researchers*" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol

- Progress and safety reports
- Notifying the end of the study The HRA website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures. **User Feedback** The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website:  
<http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/> \_\_\_\_\_



On Behalf of

**Dr Brian Neilly Chair**

*Enclosures: Copy to: Mrs Jo-Anne Robertson, Mr Raymond Hamill, NHS Lanarkshire*

## 5.2 APPENDIX B: NHSL R&D Approval Letter



Dear Ms Stark

**Project title: Trauma, Emotional Regulation, Alexithymia and Dissociation in Alcohol Dependence, Drug Dependence and Both**

**R&D ID: L16054**

NHS Lanarkshire Research & Development: Management Approval Letter Project I.D. Number: L16054

I am writing to you as Chief Investigator of the above study to advise that R&D Management approval has been granted for the conduct of your study within NHS Lanarkshire as detailed below:

For the study to be carried out you are subject to the following conditions: Conditions

- You are required to comply with Good Clinical Practice, Ethics Guidelines, Health & Safety Act 1999 and the Data Protection Act 1998.
- The research is carried out in accordance with the Scottish Executive's Research Governance Framework for Health and Community Care (copy available via the Chief Scientist Office website: <http://www.cso.scot.nhs.uk/> or the Research & Development Intranet site: <http://firstport2/staff-support/research-and-development/default.aspx>
- You must ensure that all confidential information is maintained in secure storage. You are further obligated under this agreement to report to the NHS Lanarkshire Data Protection Office and the Research & Development Office infringements, either by accident or otherwise, which constitutes a breach of confidentiality.
- Clinical trial agreements (if applicable), or any other agreements in relation to the study have been signed off by all relevant signatories.
- You must contact the Lead Nation Coordinating Centre if/when the project is subject to any minor or substantial amendments so that these can be appropriately assessed, and approved, where necessary.
- You notify the R&D Department if any additional researchers become involved in the project within NHS Lanarkshire
- You notify the R&D Department when you have completed your research ,or if you decide to terminate it prematurely.
- You must send brief annual reports followed by a final report and summary to the R&D office in hard copy and electronic formats as well as any publications.
- If the research involves any investigators who are not employed by NHS Lanarkshire ,but who will be dealing with NHS Lanarkshire patients, there may be a requirement for an SCRO check and

occupational health assessment. If this is the case then please contact the R&D Department to make arrangements for this to be undertaken and an honorary contract issued.

- I trust these conditions are acceptable to you. Yours sincerely, **Raymond Hamill** – Corporate R&D Manager cc.



NAME	TITLE	CONTACT ADDRESS	ROLE
Ms Claire Stark	Trainee Clinical Psychologist	Claire.Stark@nhs.net	Principal Investigator
Jo-Anne Robertson	..	Jo-anne.Robertson@ed.ac.uk	Sponsor Contact
Dr Stephanie Chan	Counselling Psychologist	Stephanie.Chan@lanarkshire.scot.nhs.uk	Named Contact

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### 5.3 APPENDIX C: Author Guidelines for Empirical Paper and Systematic Review

#### Drug and Alcohol Dependence

*Drug and Alcohol Dependence* is an international journal devoted to publishing original research, scholarly reviews, commentaries, and policy analyses in the area of **drug, alcohol and tobacco use and dependence**. Articles range from studies of the chemistry of **substances of abuse**, their actions at molecular and cellular sites, *in vitro* and *in vivo* investigations of their biochemical, pharmacological and behavioural actions, laboratory-based and clinical research in humans, substance abuse **treatment and prevention** research, and studies employing methods from epidemiology, sociology, and economics.

The rationale for this extensive coverage is the conviction that drug, alcohol and tobacco use/ dependence cannot be understood in their entirety from a single perspective and that without an understanding of other areas of research, studies by individual investigators may be limited. The goal of the journal is to provide researchers, clinicians, and policy makers access to material from all perspectives in a single journal in a format that is understandable and which has received rigorous editorial review. The hope of its editors is to promote mutual understanding of the many facets of drug abuse to the benefit of all investigators involved in drug and alcohol research, and to facilitate the transfer of scientific findings to successful treatment and prevention practices.

### ***Types of paper***

**1) Full-length Reports** reporting original results of research within the field of drug, alcohol and tobacco use and dependence. A Full-length Report typically should not exceed 4500 words (for the introduction, methods, results and discussion).

**2) Review Articles** of specialized topics within the scope of the journal. Typically, these are critical reviews of a field of research. A Review Article typically should not exceed 6000 words for the main body of the paper (i.e., excluding references, tables and figures). Review Articles that will be substantially longer than 6000 words should be discussed with the Editor-in-Chief prior to submission.

**3) Short Communications** reporting on research that has progressed to the stage where a preliminary publication is appropriate. The maximum length is 2000 words plus references and illustrations. There should be not more than 2 illustrations (figure or tables).

**4) Commentaries** express points of view on scientific matters or published papers. Typically, commentaries are solicited by the editors, but authors who wish to submit commentaries should contact the Editor-in-Chief to discuss the suitability of the proposed paper. A Commentary typically should not exceed 2000 words.

**5) Registered Reports** (click here for more details). These submissions undergo a two-phase review process in which study rationale and methodology are considered prior to the research being undertaken.

**6) Other forms of papers.** The journal does not publish letters to the editor, individual case studies or book reviews.

### ***References***

There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct.

#### *Formatting requirements*

There are no strict formatting requirements but all manuscripts must contain the essential elements needed to convey your manuscript, for example Abstract, Keywords, Introduction, Materials and Methods, Results, Conclusions, Artwork and Tables with Captions. If your article includes any Videos and/or other Supplementary material, this should be included in your initial submission for peer review purposes.

Divide the article into clearly defined sections.

#### *Figures and tables embedded in text*

Please ensure the figures and the tables included in the single file are placed next to the relevant text in the manuscript, rather than at the bottom or the top of the file. The corresponding caption should be placed directly below the figure or table.

Divide your article into clearly defined and numbered sections. Subsections should be numbered 1.1 (then 1.1.1, 1.1.2, ...), 1.2, etc. (the abstract is not included in section numbering). Use this numbering also for internal cross-referencing: do not just refer to 'the text'. Any subsection may be given a brief heading. Each heading should appear on its own separate line.

*Introduction* State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

*Material and methods* Provide sufficient detail to allow the work to be reproduced. Methods already published should be indicated by a reference: only relevant modifications should be described.

*Theory/calculation* A Theory section should extend, not repeat, the background to the article already dealt with in the Introduction and lay the foundation for further work. In contrast, a Calculation section represents a practical development from a theoretical basis.

*Results* Results should be clear and concise.

*Discussion* This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

*Conclusions* The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

*Appendices* If there is more than one appendix, they should be identified as A, B, etc.

Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

### ***Essential title page information***

• **Title.** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible. • **Author names and affiliations.** Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower- case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.

• **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. **Ensure that the e-mail address is given and that contact details are kept up to date by the corresponding author.** • **Present/permanent address.** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

**Abstract** A concise and factual abstract is required. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

**Highlights** Highlights are mandatory for this journal. They consist of a short collection of bullet points that convey the core findings of the article and should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point). You can view example Highlights on our information site.

**Keywords** Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

**Abbreviations** Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

**Acknowledgements** Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

**5.4 APPENDIX D - Participant Information Sheet**

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# Participant Information Sheet

## **Trauma, emotional awareness, dissociation and emotional regulation in Addiction**

You are being invited to take part in a research study. Before you decide whether or not to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Talk to others about the study if you wish. Contact us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

### **What is the purpose of the study?**

The purpose of the study is to gain a better understanding of psychological differences such as emotional awareness and how people manage their emotions in substance misuse and alcohol misuse and both. It is hoped that gaining a better understanding of this will help guide psychological treatments in the future.

### **Why have I been asked to take part?**

You have been asked to take part as you are one of the service users of your local addiction services.

### **Do I have to take part?**

No, it is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. You will also be given a copy of the signed consent form to keep. If you decide to take part you are still completely free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part, **WILL ABSOLUTELY NOT AFFECT** the standard of care you receive, or your legal rights.

### **What will happen to me if I take part?**

You will be given this patient information sheet and a consent form and time to think about whether you wish to take part. If you decide you want to take part and have signed the consent form then you will be given a questionnaire pack and a return envelope for you to complete. In our experience we have found that the questionnaire pack takes a maximum of 40 minutes to complete. You do not have to answer the questionnaire pack all in one go. You can fill the questionnaire pack at your own pace if that is more suitable for you. Help can be given if you feel you would like support to complete the questionnaires. You may contact the researcher in case of changes in your contact details or interest in this study.

### **What are the possible disadvantages and risks of taking part?**

As your participation in this study involves answering questionnaires a risk of taking part could be related to any questions that you might consider too sensitive, intrusive or upsetting. There may be a possibility of becoming upset when answering the questions. If you consider any of the questions as being inappropriate, upsetting or intrusive then please feel free not to give any answer. If you are feeling distressed, then you are able to speak to your worker or the researcher about this.

### **What are the possible benefits of taking part?**

The information we get from this study may help us improve the health care services and future

treatment of patients with addiction issues.

**Will my taking part in the study be kept confidential?**

All the information we collect during the course of the research will be kept confidential and there are strict laws which safeguard your privacy at every stage. All information collected about you will be kept in strict confidentiality. Your questionnaire results will be identified by a special code and will not have any personal identifying information. The data relating the code with your personal details will be kept separate from the questionnaire responses. All data is stored in secure locations and only the principal researcher will have access to it. Data will be kept for 10 years and then be destroyed. To ensure that the study is being run correctly, we will ask your consent for responsible representatives from the Sponsor and NHS Institution to access your data collected during the study, where it is relevant to you taking part in this research. The Sponsor is responsible for overall management of the study and providing insurance and indemnity.

**Who do I speak to if problems arise?**

If you have any concerns about any aspect of the study, please, in the first instance, discuss them with the clinician with whom you are in contact. If the problems are not resolved, or you wish to comment in any other way, please contact Dr Nuno Ferreira, Clinical Psychologist in the School of Health and Social Science of the University of Edinburgh, on Tel: 0131 650 3898 Email: nuno.ferreira@ed.ac.uk

Address: School of Health in Social Science, Teviot Place, Edinburgh, EH8 9AG

**What will happen to the results of the research study?**

The results of the study will be presented to the addiction team within the Health Board, will be published in scientific journals in the area of addiction research and clinical psychology and will be presented to fellow researchers and practitioners via conference presentations and posters. Your participation will not be identified in any report/publication. You may express your interest to obtain a copy of the published results by contacting the principal researcher.

**Who is organising the research?**

The research is sponsored by the University of Edinburgh for fulfilment of a Doctorate in Clinical Psychology research.

**Who has reviewed the study?**

All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee. NHS management approval has also been obtained.

**Contacts**

If you have any further questions about the study please contact

Claire Stark  
Trainee Clinical Psychologist  
Addiction Psychology Service  
Douglas Street Clinic, Hamilton  
ML3 0BP  
01698 368710

Dr Caroline Sneddon  
Clinical Psychologist  
PTT Rutherglen/ Cambuslang  
Eastvale Resource Centre  
130 Stonelaw Road, Glasgow  
G73 2PQ

Email: [addictionstudy16@gmail.com](mailto:addictionstudy16@gmail.com)

If you wish to make a complaint about the study, please contact NHS Lanarkshire:

Patient Affairs Manager

Tel: 01698 858321

Email: [laura.jack@lanarkshire.scot.nhs.uk](mailto:laura.jack@lanarkshire.scot.nhs.uk)

NHS Lanarkshire Headquarters, Kirklands, Fallside Road, Bothwell. G71 8BB

## 5.5 APPENDIX E: Participant Consent Form



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**Trauma, emotional awareness, dissociation and emotional regulation in addiction**

Researcher: Claire Stark, Trainee Clinical Psychologist, Email: [addictionstudy16@gmail.com](mailto:addictionstudy16@gmail.com)

**Please initial box**

1.	I have read and understood the information about the project, as provided in the Information Sheet dated 29.02.16 (V1.3) and have had the opportunity to consider the information and ask questions.	
2.	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected.	
3.	I understand that data collected during the study may be looked at by individuals from the Sponsor, from the NHS organisation or other authorities, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.	
4.	The procedures regarding confidentiality have been clearly explained (e.g. use of names, pseudonyms, anonymisation of data, etc.) to me.	
5.	The use of the data in research, publications, sharing and archiving has been explained to me.	
6.	I agree to take part in the above study	

**Participant:**

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**Researcher:**

\_\_\_\_\_  
Name of person taking consent

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

If you would like to be contacted about the results of this study please provide an email address below. Your email address will only be used to inform you of the results of the study and will not be used for any other purpose or given to anyone except the principal researcher.

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## **5.6 APPENDIX F: Initial Study Protocol from IRAS**

**Design** The study will be a cross-sectional, quantitative design. Participants will complete 4 self-report measures, a demographic questionnaire which will ask for information including age, gender and a brief questionnaire on the duration and type of substance misuse.

**Sample** Participants will be recruited from NHS addiction services. Participants will be

existing users of NHS services and will be asked to participate by their addiction worker. Informed consent will be sought and the procedure explained fully.

Sample size guidelines for multinomial logistic regression indicate a minimum of 10 cases per independent variable (Schwab, 2002). Previous research with people with substance misuse disorder and trauma symptoms have found a medium effect size. Assuming a power level of 0.8 with significance at  $p \leq 0.05$  for the multinomial logistic regression then 117 participants will be required for the current study. G-power was used for all calculations (Faul, Erdfelder, Buchner & Lang, 2009). There will be three groups: alcohol dependent participants, drug dependent participants and participants addicted to alcohol and drugs. Therefore, there will need to be a minimum of 39 participants in each group.

**Procedure** The addiction teams in each locality will be given information about the study and also information leaflets. These will be given to potential participants and they can then opt to take part in the study. It is anticipated that the participants' addiction worker will give him or her the questionnaire to complete after they have understood and consented to take part. Participants will be advised that they can withdraw from the study at any time and the individual responses will be anonymous. Participants will be asked to be as honest as possible and assured that their responses are confidential. Participants will complete the self-report measures and a demographic sheet which will ask for information including age, gender, postcode and length and type of substance misuse. The postcode will be asked as this will be used to understand the Scottish Index of Multiple Deprivation.

It has been found that there can be some confusion between the effects of the substances themselves, the symptoms of withdrawal and dissociation (Langeland, Draijer & van der Brink, 2002). Therefore when trying to measure dissociation it is important that people are at least two weeks free of any substance misuse. Therefore, participants will be asked whether they have been abstinent for the past 2 weeks.

Questionnaires will have addressed envelopes that participants can post back or they can hand them back to their addiction worker. The participants will also be asked to provide an email address if they wish to be contacted about the results of the study. This will be entirely optional and email addresses will be on a separate sheet that will not be used to identify the data in any way. If any participant required further information then the contact details of the researcher will be provided to them in the information sheet.

**Response Rates** This project is being supported by NHS Lanarkshire Addictions service. Lanarkshire is split into two different council areas and the addictions service work differently in each locality. Therefore, each individual locality will be given information about the study. Between January and March 2015 the South Lanarkshire team received 389 referrals for drug misuse and 820 referrals for alcohol misuse. The North Locality has comparable referral rates. Taking into account the 40% non-attendance for first appointment this gives a sizeable population of 863 participants in a 3 month period in South Lanarkshire alone to recruit from. It is anticipated that the needed sample size for this study will be able to be achieved.



