

Abstract

Facial Affect Recognition Accuracy in Individuals with Substance Use Disorders

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Substance use, like many human behaviors, occurs along a broad continuum from no use to extremely heavy use. Satisfactory interpersonal interaction involves understanding others' facial affect. There is a lack of research on facial affect recognition accuracy in individuals with substance use disorders. This archival study will seek to explore individuals with substance use disorders facial affect recognition accuracy. This archival study was conducted with data from 10 Project Working Recovery consumers. These consumers had met the admission criteria for PWR, including being at least 18 years old, presenting with a substance use disorder, and being psychiatrically and medically stable enough to receive services at the intensive outpatient level. Data was collected as part of Project Working Recovery's clinical service; consumers were informed of the objectives, benefits, and possible inconveniences prior to completing the Diagnostic Analysis of Nonverbal Accuracy 2-Adult Facial Expressions (DANVA2-AF). The DANVA2-AF was administered and consumers were asked to identify the facial affect of 24 stimuli. Demographic data and results from the DANVA2-AF were analyzed to explore the study objective.

Facial Affect Recognition Accuracy in Individuals with Substance Use Disorders

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by

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Chapter 1

Introduction

Introduction to the chapter

This chapter is an introduction to facial affect recognition accuracy with individuals who have substance use disorders. It will explain the general social problems and consequences of the substance abuse, identifying the specific knowledge gap that this study will address, as well as present arguments for why this study should be done. A presentation of the study objective will be presented. Also, the introduction will include how this study will advance the substance abuse field and help address facial affect recognition accuracy in individuals with substance use disorders. Operational definitions of variables and key concepts will be presented.

Background of the study

Substance use, like many human behaviors, occurs along a broad continuum from no use to extremely heavy use. The likelihood of an individual experiencing problems stemming from substance use typically increases as the rate of use increases (*The nature of substance use disorders*). For this study, substance use disorders (SUDs) includes substance dependence and substance abuse. Substance dependence as described by the Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision (2000) is comprised of cognitive, behavioral, and physiological symptoms indicating that the individual continues use of the substance despite significant substance related problems. Dependence is a pattern of use which results in tolerance, withdrawal, and compulsive drug taking behavior. Substance abuse is characterized as a maladaptive pattern of substance use manifested by recurrent and significant adverse consequences related to the repeated use of substances. In order for an abuse criterion to be met,

the substance-related problem must have occurred repeatedly during the same twelve month period (*Diagnostic and statistical manual of mental disorders: DSM-IV* 2000).

According to the National Survey on Drug Use and Health (NSDUH, 2008), an estimated 22.2 million persons age 12 or older were classified with substance dependence or abuse in the past year. Of these, 3.1 million were classified with dependence on or abuse of both alcohol and illicit drugs, 3.9 million were dependent on or abused illicit drugs but not alcohol, and 15.2 million were dependent on or abused alcohol but not illicit drugs. Further, one in four deaths in the United States is a result of alcohol, tobacco, or drug use. Alcohol abuse alone costs nearly \$166 billion each year. Additionally, drug offenders account for more than 30% of the growth in the state prison population and more than 80 percent of the increase in the number of federal prison inmates since 1985 (*Results from the 2008 NSDUH: National findings, SAMHSA, OAS*).

Problem statement

Satisfactory interpersonal interaction involves understanding others' facial expressions. Facial expressions of emotion provide a means of communicating and obtaining information about one's social environment and provide cues to interpersonal exchanges. Individuals with substance use disorders often have severe interpersonal difficulties that may relate to poor and distorted perception of facial expression (Frigerio, Burt, Montagne, Murray, & Perrett, 2002). It is for these reasons why this study explores individuals with substance use disorders facial affect recognition accuracy.

Study goal: exploration

Substance use disorders are chronic relapsing disorders characterized by persistent brain alterations associated with cognitive, motivational, and emotional alterations (*Diagnostic and statistical manual of mental disorders: DSM-IV* 2000). Neuropsychological studies have demonstrated extensive mid- and long-term cognitive alterations in individuals with substance use disorders, but there is disproportionately less research on the neuropsychology of emotional alterations associated with substance use disorders (Fernández-Serrano et al., 2010). There is research into facial affect recognition accuracy in individuals with alcohol use disorders showing that they have a tendency to overestimate the intensity of certain emotions (Fernández-Serrano et al., 2010), but there is a lack of research on individuals with other substance use disorders. One of the key aspects of adaptive emotional functioning is the ability to decode emotional cues and recognize emotions in the faces of others, especially in relation to the four basic emotions: anger, fear, happiness, and sadness (Adolphs, 2002).

Study objective

To explore individuals with substance use disorders facial affect recognition accuracy. This study will seek to explore this objective by examining differences in facial affect recognition accuracy in a sample of individuals with substance abuse disorders.

Study significance

Facial affect recognition accuracy is relevant to substance use disorders in several regards. Affect recognition accuracy is fundamental for prosocial behavior, normal socialization and interaction, which can be impaired in individuals with substance use disorders (Blair, 2003). Moreover, simulation theories argue that the emotional states of others are understood and

recognized by generating similar states in oneself and evidence supports the link between altered affect recognition and parallel alterations in emotion experience and behavior manifestations (Fernández-Serrano et al., 2010). In other words, in order to understand and recognize facial affect in others, we must first be able to experience the same affect ourselves.

Definitions of terms

Independent variable - substance use disorders

Dependent variable - facial affect recognition accuracy.

Facial affect recognition accuracy (FARA) - the ability to accurately identify the emotional state of another person based upon their facial expression.

Substance use disorder (SUD) - meeting the DSMIV-TR criteria for substance abuse or substance dependence.

Somatic Marker Theory of Addiction - proposes that decision-making depends on neural substrates that regulate homeostasis, emotion and feeling. According to this model, there is a link between alterations in processing emotions in individuals with substance use disorders, and their impairments in decision-making.

Project Working Recovery (PWR) - a service research project designed to assist individuals to choose, get, and keep a job, as a means to sustain their recovery from substance use disorders.

Project Working Recovery is supported by the East Carolina University Department of Rehabilitation Studies, which is housed within the College of Allied Health Sciences in the Health Sciences Building.

Diagnostic Analysis of Nonverbal Accuracy 2 Adult Facial Expressions (DANVA2-AF) - a computer task that assesses recognition of facial emotional expressions. A series of 24 stimuli featuring an equal number faces portraying basic emotions are presented. Faces depict expressions of happiness, sadness, anger, and fearful facial expressions of high and low intensities.

Chapter summary

This chapter explained substance use disorders include substance abuse and substance dependence according to the criteria set forth by the DSMIV-TR (2000). Substance use disorders affected 22.2 million people in 2008 and cost our economy \$414 billion annually in addition to killing 1 in 4 Americans (*Results from the 2008 NSDUH: National findings, SAMHSA, OAS*). There is research showing that facial affect recognition accuracy is impaired in individuals with alcohol use disorders and causes an overestimation of the intensity of certain emotions (Fernández-Serrano et al., 2010). There is a lack of research on facial affect recognition accuracy with individuals who have problems with other substances. This study looks to explore facial affect recognition accuracy in individuals with substance use disorders. This study is significant in that it will begin a line of research into facial affect recognition accuracy which is fundamental for prosocial behavior, normal socialization and interaction, which can be impaired in individuals with substance use disorders (Blair, 2003).

Chapter 2

Literature Review

Introduction to the chapter

This chapter will review literature as it relates to the study. It will begin by reviewing literature relevant to the somatic marker theory of addiction as it pertains to individuals with substance use disorders and facial affect recognition accuracy. Next, literature will be reviewed of relevant empirical research on individuals with substance use disorders and facial affect recognition accuracy. This chapter will also review similar studies findings on facial affect recognition accuracy such as with schizophrenia, antisocial personality disorder, and generalized personality disorder. Lastly, conclusions will be drawn from the literature reviews and address the gap in knowledge as it relates to individuals with substance use disorders and facial affect recognition accuracy.

Review of relevant theory

The neural substrates involved in facial affect recognition accuracy and the maintenance of substance use disorder include the orbitofrontal cortex, the cingulated gyrus, the insula, and the ventral striatum (Verdejo-García & Bechara, 2009). There is evidence of relative specificity in the neural systems supporting recognition of discrete emotions, these include an association between fear and the amygdale, disgust and the insula/basil ganglia, and anger and the lateral orbitofrontal cortex and the ventral striatum (Calder, Lawrence, & Young, 2001). Therefore, it is reasonable to assume that substance use disorders can be selectively associated with decreased functioning of particular cognitive and neural systems.

Neurophysiological research provides a platform to examine individuals with substance use disorders and facial affect recognition accuracy. The somatic marker framework provides a systems level neuroanatomical and cognitive framework for decision making and for choosing according to long-term outcomes rather than short-term ones (Verdejo-García, Pérez-García, & Bechara, 2006). The main point of the somatic marker theory is that decision-making is a process of emotions. The model attributes difficulty in individuals with substance use disorders in making advantageous decisions in real-life to a impairment in an emotional mechanism that rapidly signals the prospective consequences of an action, and accordingly assists in the selection of the advantageous response option. For example, this emotional mechanism of anger is a somatic state, a special instance of feelings that arise in bioregulatory processes and can be enacted in the body, involving physiological modification or in brain areas involved in the representation of emotional states (Verdejo-García et al., 2006).

Neuropsychological studies support the association between severity of substance intake and alterations in specific cognitive domains and neural systems (Fernández-Serrano et al., 2010), but there is disproportionately less research on the neuropsychology of emotional alterations associated with substance use disorders. One of the key aspects of adaptive emotional functioning potentially relevant to substance use disorder progression and treatment is the ability to recognize basic emotions in the faces of others. The term “somatic” refers to the collection of body- and brain-related responses that are the hallmarks of affective and emotional responses. The somatic marker theory postulates that individuals with a substance use disorders ability to experience and express emotions normally and his/her social behavior, undergo marked changes. According to Verdejo-Garcia and Bechara (2006), these individuals begin to make choices that

often lead to financial losses, loss in social standing, and even loss of family and friends because of their substance use disorder.

Review of relevant empirical research on above theory

Relatively few studies have examined emotional perception, experience, and their relationship to decision-making in individuals with substance use disorders. Most studies on facial affect recognition accuracy have focused on analyzing possible alterations in the processing of emotional facial expressions in individuals with long-term substance use disorders (Hoshi, Bisla, & Curran, 2004). However, the results of such studies were mixed (Kornreich et al., 2001). Some studies have reported that individuals with chronic alcohol use disorders show significant alterations in the processing of facial affect. One study showed that individuals with alcohol dependence showed specific impairments for recognizing facial expressions portraying happiness and anger (Kornreich et al., 2001). These alterations were characterized as overestimation of the intensity of the emotion depicted in these emotional facial expressions. Similar results have been revealed in individuals who have been abstinent with both alcohol and opiate dependence, and in individuals with opiate use disorders following methadone treatment (Kornreich et al., 2003). By contrast, other studies showed that overestimation of the intensity of emotion in facial expressions reported by individuals with alcohol use disorders related mainly to the facial expression of fear. The degree of this overestimation correlated with the number of previous formal detoxifications (Townshend & Duka, 2003).

Other studies revealed that individuals with alcohol use disorders present with difficulties in distinguishing between facial expressions of anger and disgust. Individuals with alcohol use disorders are frequently confronted with interpersonal problems even when sober,

and these problems representing a major cause of relapse (Kornreich et al., 2003). Among other factors, good interpersonal relationships depend on the ability to decode non-verbal signals from communicating partners. Awareness of the partner's feelings allows one to tune one's reactions and to ensure good interpersonal communication. Therefore the aforementioned studies support the idea that individuals with alcohol use disorders' interpersonal problems could be partly linked to impaired facial affect recognition accuracy.

Other studies have analyzed the effects of acute doses of different substances on the perception of emotions. These studies have shown that acute low doses of alcohol and methylenedioxymethamphetamine (MDMA) can improve facial affect recognition accuracy in current users, although recognition accuracy significantly decreased during the following days (Hoshi et al., 2004). Detrimental effects of acute drug doses on facial affect recognition accuracy have also been reported using ketamine, and NMDA receptor antagonist (Abel et al., 2003). These results indicate that substance using individuals' recognition of facial expressions portraying different emotions including fear, anger, disgust, and happiness can be impaired during and after use. The poorer recognition of facial affect accuracy can affect substance using individuals' interpretation of social cues, so that they can be less able to manage and regulate emotions, and to make decisions and solve problems of an interpersonal or social nature.

Although these are relatively few studies, the evidence suggests that individuals with substance use disorders present with a reduced ability to perceive and experience emotions. In this sense, their reduced ability to recognize facial emotional expressions has been attributed to several aspects of their behaviors, such as diminished empathy, increased levels of aggression (Hoshi et al., 2004), and a higher frequency of relapse and ensuing alcohol detoxification

(Townshend & Duka, 2003). In particular, poor recognition of fear expressions, which is thought to depend on the amygdale, can be associated with impaired conditioning of fear responses to substance related environments, increasing the probability of relapses (Verdejo-García & Bechara, 2009). This reduced ability merits further investigation, since it might be importantly related to the weak processing of somatic signals during decision-making. In other words, this reduced perception and experience of emotions observed in individuals with substance use disorders, may be the underlying cause of their poor decision making in real life, and their apparent “myopia” for the long-term consequences of their actions.

Review of facial affect recognition accuracy studies with individuals with other disorders

Research on facial affect recognition accuracy has been conducted with individuals with various mental illnesses such as schizophrenia, antisocial personality disorder, and generalized anxiety disorder (Blair, 2001; Blair, 2003; Brekke, Hoe, Long, & Green, 2007; Bryson, Bell, & Lysaker, 1997; Fiszdon & Johannesen, 2010; Lewis & Garver, 1995; Marsh & Blair, 2008; Montagne et al., 2006; Mueser et al., 1996; Penn & Combs, 2000; Turetsky et al., 2007; Vauth, Rüsch, Wirtz, & Corrigan, 2004; *MIT press journals - journal of cognitive neuroscience - abstract*). For example, deficits in the ability to accurately interpret affect recognition accuracy have been well documented in individuals with schizophrenia. This information is relevant to substance use disorders because individuals with schizophrenia often have social competence and work behavior deficits as do individuals with substance use disorders. Research shows that individuals with schizophrenia responded less accurately on measures of facial affect recognition accuracy in comparison with individuals without mental illness, these differences are detectable

before the onset of psychotic symptoms, and that deficits persist through changes in clinical and treatment status (Lewis & Garver, 1995).

Additionally, psychophysiological studies of individuals with schizophrenia have shown abnormalities in neuronal process underlying affect recognition, including visual encoding of structural facial features and subsequent decoding of facial affect features (Turetsky et al., 2007). Facial affect recognition accuracy has also been linked to primary targets of psychiatric rehabilitation for with individuals who have schizophrenia, including neurocognitive ability (Bryson et al., 1997), social competence (Mueser et al., 1996), and work behavior (Vauth et al., 2004), as well as rate of improvement in general functioning during psychosocial rehabilitation (Brekke et al., 2007). Importantly, affect recognition accuracy may be a mediator of the relationship between neurocognition and functional outcomes in schizophrenia (Vauth et al., 2004). Taken together, these findings help clarify why psychosocial interventions designed to restore functional capacities in individuals with schizophrenia have placed such emphasis on the fundamental social cognitive process (Penn & Combs, 2000).

Given this information, it is reasonable to propose that psychosocial interventions may also restore functional capacities to individuals with substance use disorders. Research shows that individuals with schizophrenia require higher intensities in facial affect to accurately recognize fearful or happy face images from neutral ones (Fiszdon & Johannesen, 2010). Moreover, there are many reasons to suggest that facial affect recognition accuracy deficits could have profound impact on real-world functional outcomes in individuals with schizophrenia and in individuals with substance use disorders. Much of the social world is communicated through facial affect recognition accuracy. During social encounters, social competence is highly

dependent on the ability to accurately decipher and integrate these cues with personal behavior. Because social interaction is instrumental to many daily activities, the ability to effectively manage social interaction becomes increasingly important as individuals engage in more complex community living tasks (Fiszdon & Johannesen, 2010).

Additionally, research shows that aggression and other antisocial behaviors may result from failure to accurately recognize certain facial affects (Blair, 2003). As with individuals with substance use disorders, processing facial affect recognition accuracy is crucial for socialization and normal social interaction with individuals with antisocial behaviors (*MIT press journals - journal of cognitive neuroscience - abstract*). Research suggests that distress-related facial affects, particularly fearful expressions, play an important role in inhibiting antisocial behavior. Accordingly, many studies find impairments in processing distress-related cues among individuals with antisocial behaviors (Blair, 2001). For example, research shows a link between antisocial behavior and impaired recognition of fearful facial affect. Relative to comparison groups of individuals without, individuals with antisocial behaviors showed significant impairments in recognizing fearful, sad, and surprised facial affects. Individuals with antisocial behaviors were not impaired in recognizing happiness, anger, or disgust affects accurately. Deficits for recognizing fear were significantly greater than deficits for any of the other expressions. This specificity suggests that fear recognition deficits in individuals with antisocial behaviors sampled do not simply reflect differences in factors that alter facial affect recognition accuracy broadly, such as general intelligence, attention, task-specific motivation, or perceptual processing deficits. Rather, they suggest that antisocial behavior may be associated with deficits in neurocognitive mechanisms that specifically underlie processing of fearful expressions (Marsh & Blair, 2008). Given this information, it would be reasonable to propose that individuals with

substance use disorders who also exhibit antisocial behaviors have diminished empathy and increased levels of aggression and that these deficits may be a result of impaired facial affect recognition accuracy.

Also, facial affect recognition accuracy has been researched in individuals with generalized anxiety disorder. That is, individuals with generalized anxiety disorder were less accurate in recognizing negative facial expressions of anger, disgust, fear, and sadness compared to a norm group. Furthermore, there was no difference for the positive facial expressions of happiness and surprise between the two groups (Montagne et al., 2006). Generalized anxiety disorder is relevant to substance use disorders in that individuals with substance use disorders may experience symptoms of anxiety while going through withdrawal. In these cases the anxiety symptoms may be substance induced and may subside with prolonged abstinence. For other individuals, the symptoms of anxiety persist and may worsen with prolonged abstinence thus making recovery more difficult (Montagne et al., 2006).

Conclusion from reviews

Neuropsychological studies have demonstrated extensive mid- and long-term cognitive alterations in individuals with substance use disorders, but there is disproportionately less research on the neuropsychology of facial affect recognition accuracy associated with substance use disorders (Fernández-Serrano et al., 2010). Research shows that individuals using alcohol and MDMA often have severe interpersonal difficulties that may relate to poor and distorted perception of facial expression. While facial expressions of emotion provide a means of communicating and obtaining information about one's social environment and provide cues to interpersonal exchanges it has not been studied with individuals who have other substance use

disorders (Adolphs, 2002). Research shows that satisfactory interpersonal interaction involves understanding others' facial expressions in other disorders such as schizophrenia, generalized anxiety disorder, and antisocial personality disorder (Blair, 2001; Blair, 2003; Brekke et al., 2007; Bryson et al., 1997; Fiszdon & Johannesen, 2010; Lewis & Garver, 1995; Marsh & Blair, 2008; Montagne et al., 2006; Mueser et al., 1996; Penn & Combs, 2000; Turetsky et al., 2007; Vauth et al., 2004; *MIT press journals - journal of cognitive neuroscience - abstract*) It is for these reasons why this study will look to explore individuals with substance use disorders facial affect recognition accuracy.

Chapter summary

The somatic marker theory of addiction proposes that decision-making depends on neural substrates that regulate homeostasis, emotion and feeling. According to this model, there is a link between alterations in facial affect recognition accuracy in individuals with substance use disorders, and their impairments in decision-making (Verdejo-García et al., 2006).

Neuropsychological studies support a lack of research on the neuropsychology of emotional alterations associated with substance use disorders (Calder et al., 2001; Fernández-Serrano et al., 2010; Verdejo-García et al., 2006; Verdejo-García & Bechara, 2009). One of the key aspects of adaptive emotional functioning potentially relevant to substance use disorders progression and treatment is the ability to recognize basic emotions in the faces of others.

There are relatively few studies that examined emotional perception, experience, and their relationship to decision-making in individuals with substance use disorders, and the results of such studies are mixed. Some studies have reported that individuals with alcohol use disorders show significant alterations in the processing of facial affect in happiness, disgust, anger, and

fear (Kornreich et al., 2001; Kornreich et al., 2003; Townshend & Duka, 2003). After reviewing similar studies, it is clear that impairment of facial affect recognition accuracy is found in other diagnostic disorders found in the DSMIV-TR such as generalized anxiety disorder, antisocial personality disorder, and in schizophrenia (Blair, 2001; Blair, 2003; Brekke et al., 2007; Bryson et al., 1997; Fiszdon & Johannesen, 2010; Lewis & Garver, 1995; Marsh & Blair, 2008; Montagne et al., 2006; Mueser et al., 1996; Penn & Combs, 2000; Turetsky et al., 2007; Vauth et al., 2004; *MIT press journals - journal of cognitive neuroscience - abstract*). From this the continued study of facial affect recognition accuracy in individuals with substance use disorders is important. This will help increase their understanding of the population and potentially treatment.

Chapter 3

Methodology

Introduction to the chapter

This chapter will review the methodology of this study. It begins with a restatement of the study objective and then describes how the study will explore this objective. This chapter will also describe the population being studied, provide justification for sample size and how it will be determined, discuss the instrumentation that was used, and the procedures as to how the data was collected, stored, and managed. Lastly, this chapter will discuss and justify the statistical analysis used for answering the research question, and describe ethical considerations.

Study objective

This study explored facial affect recognition accuracy in a small sample of individuals with substance use disorders. Specifically, this study explored individuals with substance use disorders facial affect recognition accuracy.

Research design

An archival study of facial affect recognition accuracy data from a small sample of persons with substance use disorders was conducted. Specifically, facial affect recognition accuracy data collected by clinicians from consumers at Project Working Recovery was analyzed. Ten consumers' demographic data and results from the Diagnostic Analysis of Nonverbal Accuracy 2-Adult Facial Expressions (DANVA2-AF) were analyzed to answer the study objective.

Sample

The archival study was conducted with data from 10 Project Working Recovery consumers. These consumers had met the admission criteria for PWR, including being at least 18 years old, presenting with a substance use disorder, and being psychiatrically and medically stable enough to receive services at the intensive outpatient level.

Instrumentation

The Diagnostic Analysis of Nonverbal Accuracy 2-Adult Facial Expressions (DANVA2-AF) is a computer task that assesses recognition of facial affect accuracy. A series of 24 stimuli featuring an equal number faces portraying basic emotions was presented. Faces depicted expressions of happiness, sadness, anger, and fearful facial expressions of high and low intensities (Nowicki & Carton, 1993). Each face was presented on a computer monitor for two seconds and individuals were asked to select one of the four expression labels (listed above) that best describe the emotion expressed. The labels were visible throughout the testing, thus minimizing working memory demands, and individuals were given as much time as they required to respond. No feedback was given regarding the appropriateness of their responses. For this study, the researcher was interested in the number of correct identifications for each of the four emotions displayed.

Once a consumer finished, his/her answers were displayed and an analysis was run in which error tables were formulated. Psychometrically, the DANVA2-AF shows internal consistency with children as young as 3 and with adults as old as 100. It is designed to be used with a variety of participants differing in age, sex, race, cultural background, intellectual ability, and psychological adjustment (DANVA2-AF).

Procedures

As part of Project Working Recovery's clinical service, consumers were informed of the objectives, benefits, and possible inconveniences prior to completing the DANVA2-FA. Consumers were then asked to take a seat in front of a computer while the DANVA2-FA was accessed by a Project Working Recovery clinician. The clinician then clicked on New Client and then on Complete. This was done only once per consumer. The clinician then clicked on Main Menu to return. To administer the Adult Faces, the clinician clicked on Adult Faces 2 and then clicked on Create New Adult Faces 2 Record. Next the clinician typed in the consumer's ID number. The clinician then clicked on Administer Faces and testing began. Each photograph was shown for two seconds and was then withdrawn. The consumer then made their selection and then clicked on the "Next" button. The next photograph was then shown. This process repeated until all twenty-four faces were shown. Once this occurs, the consumer's answers were displayed.

Once the receptive test was completed, consumers were asked to choose their incentives for completion of the service. Incentive choices included \$12.00 worth of either McDonald's gift certificates or Greenville area bus passes.

Statistical analyses

A computer scoring program included in the DANVA2-AF software allows for the scoring of subtest errors for separate emotions by intensities. Error profile tables were computed for each subtest. These error profiles allowed the researcher to quickly identify the pattern of difficulties participants had. The researcher then used descriptive statistics to describe the data

set. This included a demographic report. The norm group data used for this study was taken from the DANVA2-AF manual.

Ethical considerations

All hard copy evaluation data were secured in a locked file cabinet within the Department of Rehabilitation Studies. All electronic data were password protected and stored on secured computer hard drives. Researcher, Drs. Toriello, Sligar, the project coordinator, and counselors had access to the research data. Participants' first names, last name initial, and a researcher assigned five-digit code was used to identify participants on their completed receptive test. At the end of the study, all research data was completely de-identified, save for the five digit code, and entered into an electronic database. Subsequently, all hard copy research data were destroyed.

Chapter summary

This chapter explored the methodology of this study. This study explored facial affect recognition accuracy in individuals with substance use disorders. The study objective was stated, the population was defined as individuals with substance use disorders according to the DSMIV-TR, and an archival study was completed. The DANVA2-AF is a receptive test used to measure facial affect recognition accuracy. Descriptive methods were used to describe the data between facial affect recognition accuracy and individuals with substance use disorders. Lastly, ethical considerations were discussed to address confidentiality and the storage of data.

Chapter 4

Results

Introduction to the chapter

The results of this study will be presented in this chapter. It will include descriptive data comprised of reports of response rate, sample demographics, descriptive statistics, and statistical assumptions. Data analyses for the research will then be presented for the study objective. Lastly, a summary of the information presented in this chapter will be provided.

Descriptive data

As part of this archival study, consumers were asked to fill out a brief demographic survey before completing the DANVA2-AF. This demographic data revealed that of the 10 consumers who participated in this intervention, half (N = 5) were males and half (N = 5) were females. Ages ranged from 30 to 58 years old with a mean age of 47.9 years old and median age of 49 years old. Educational level for consumers revealed that 10% (N = 1) had some high school but did not finish, 30% (N = 3) completed high school, 30% (N = 3) attended some college but did not finish, 20% (N = 2) had an associate's degree, and 10% (N = 1) completed some graduate work. In regards to employment status, 90% (N = 9) of consumers were unemployed and looking for work, and the remaining 10% (N = 1) were employed part time. Seventy percent (N = 7) of consumers identified themselves as White/Caucasian and 30% (N = 3) identified themselves as Black/African American. All consumers indicated that their expected family income would be less than \$25,000 for the 2010 year. Consumers were asked if they had children, 60% (N = 6) responded yes and 40% (N = 4) responded no. Of those consumers who responded yes, the average number of children that they had was 3. Lastly, the consumer's substance use disorder(s)

were recorded. The substance use disorder diagnosis' reported fell into 6 different categories as described in Table 1. Of the 10 consumers, 20% (N = 2) were diagnosed with opioid dependence, 10% (N = 1) with cocaine dependence, 10% (N =1) with alcohol dependence, 10% (N =1) with cocaine dependence and alcohol dependence, 30% (N =3) with opioid dependence and cocaine dependence, and 10% (N = 1) with opioid dependence, cocaine dependence, and alcohol abuse.

Table 1

Substance Use Disorder Diagnosis

Diagnosis	Number of Consumers Surveyed
Opioid Dependence	3
Alcohol Dependence	1
Cocaine Dependence	1
Opioid & Cocaine Dependence	3
Cocaine & Alcohol Dependence	1
Opioid & Cocaine Dependence & Alcohol Abuse	1

Note. N = 10

Data analysis for study objective

The objective for this study was to explore individuals with substance use disorders facial affect recognition accuracy. Table 2 shows the mean and standard deviation for errors in facial

affect recognition accuracy in consumers in comparison with the norm group on the DANVA2-AF. The norm group that was used for this study was taken from the DANVA2-AF manual and is included in Appendix A. Consumers showed impairment in facial affect recognition accuracy as evidenced by an increased number of errors on recognizing facial affect. The data shows that consumers have a mean number of 6.5 errors in facial affect recognition accuracy. In comparison, the norm group of individuals without substance use disorders, the mean number of errors in facial affect recognition accuracy was 5.1.

Table 2

Mean and Standard Deviations for Errors in Facial Affect Recognition Accuracy

Age	Individuals with SUDs			Norm Group		
	N	M	SD	N	M	SD
22-60	10	6.5	2.4	440	5.1	2.5

Table 3 shows facial affect recognition accuracy in consumers. The data shows that consumers are able to accurately recognize the facial affect of happiness 96.7% of the time. This number is clinically significant in that there were only 2 errors in recognizing facial affect recognition with happiness, in comparison to the mean number of errors with the norm group, consumers more accurately identified this particular affect. Consumers had the most difficulty identifying the facial affect of fear; they correctly identified this affect 56.3% of the time. Consumers also showed deficits in accurately recognizing the facial affects of fear and sadness.

The data showed that consumers were able to identify sadness correctly 3 out of 4 times and showed that consumers were able to identify anger 61.6% of the time.

Table 3

Facial Affect Recognition Accuracy in Consumers

Facial Affect	Number of Facial Affect Recognition Errors	Facial Affect Recognition Accuracy
Happy	2	96.7%
Sad	15	75.0%
Anger	23	61.6%
Fear	25	56.3%

Consumers made a total of 65 errors in facial affect recognition accuracy. Table 4 reveals the errors between the facial affect displayed by the DANVA2-AF and the facial affect identified by consumers. Each of the 10 consumers was shown 6 pictures of each affect. The data shows that consumers had the most difficulty accurately recognizing the facial affect of fear. There was a total of 25 errors made which is 38.5% of total errors for this affect with 18 errors occurring in which substance consumers recognized the facial affect of fear as happiness. Additionally consumers had 23 errors or 35.3% of the total errors in recognizing the facial affect of anger. Overall, consumers identified the facial affect of anger as happiness 12 times, sadness 7 times, and fear 4 times. Lastly, the facial affect of sadness was erroneously recognized as anger 6 times fear 5 times, and happiness 4 times.

Table 4

Errors Made Between Facial Affect Displayed by the DANVA2-AF and Facial Affect Identified

Facial Affect	Facial Affect Identified by Individuals with SUDS					
	Happy	Sad	Angry	Fearful	Total Errors	% of Total Errors
Happy	-	0	1	1	2	3.1%
Sad	4	-	6	5	15	23.1%
Angry	12	7	-	4	23	35.3%
Fearful	18	4	3	-	25	38.5%

Note. Total number of errors = 65

In contrast, Table 5 shows facial affect recognition accuracy by substance used. This data reveals that consumers who's substance used is opioids have the most errors in facial affect recognition with 26 errors. This number is significant in those facial affect recognition accuracy errors with consumers who used opioids accounts for 40% of the total number of errors.

Additionally, consumers who used opioids and cocaine had 16 errors which is 25% of the errors made. The substance used by consumers which yielded the least number of errors was cocaine and alcohol. Consumers who used cocaine and alcohol had a total of 4 facial affect recognition accuracy errors or 6% of the total number of errors. It is important to note that more than one substance used did not correlate with an increased number of facial affect recognition errors.

Table 5

Number of Facial Affect Recognition Accuracy Errors by Substance Used

Substance Used	Happy	Sad	Angry	Fear	Total Errors	% of Total Errors
Cocaine	0	0	3	3	6	9%
Alcohol	0	0	3	3	6	9%
Opioid	1	7	8	10	26	40%
Opioid & Cocaine	0	5	6	5	16	25%
Cocaine & Alcohol	0	1	2	1	4	6%
Opioid, Cocaine, & Alcohol	1	2	1	3	7	11%

Note. Total number of errors = 65

Chapter summary

This chapter presented the results of the archival study on facial affect recognition accuracy in individuals with substance use disorders. Response rate, sample demographics, descriptive statistics for all variables, and statistical assumptions were presented. Additionally, statistical results for the research question were explored.

Chapter 5

Discussion

Introduction to the Chapter

Chapter 5 discusses the results presented in chapter 4. A concise review of the study's exploration, participants, and data collection will be presented as a summary of the study. Interpretation of results will then be presented in that the researcher will sequentially interpret all results based on comparison to studies reviewed in chapter 2. Study limitations will be addressed to explore how research design, sampling, and instrumentation limit the interpretation and generalizability of the results. This chapter will also state how results may impact practitioners and state what future research should address in the implications of findings for future research, practice, and administration portion. Lastly, conclusions will be drawn from results that address the problem statement and study significance as described in chapter one.

Summary of the study

This archival study sought to explore individuals with substance use disorders facial affect recognition accuracy. This archival study was conducted with data from 10 Project Working Recovery consumers. These consumers had met the admission criteria for PWR, including being at least 18 years old, presenting with a substance use disorder, and being psychiatrically and medically stable enough to receive services at the intensive outpatient level.

Data was collected as part of Project Working Recovery's clinical service; consumers were informed of the objectives, benefits, and possible inconveniences prior to completing the DANVA2-FA. The DANVA2-AF was administered and consumers were asked to identify the facial affect of 24 stimuli. Demographic data and results from the Diagnostic Analysis of

Nonverbal Accuracy 2-Adult Facial Expressions (DANVA2-AF) were analyzed to explore the study objective.

Interpretation of the results

The principal findings from this exploratory study is that a small sample of individuals with substance use disorders revealed impairment in their facial affect recognition with expressions portraying negative emotions of anger, fear, and sadness, but not positive emotions of happiness. In comparison with the norm group of individuals without substance use disorders, individuals with substance use disorders made more errors in facial affect recognition accuracy with an average of 1.4 more errors made. This study showed that individuals who used opioids made the most errors in facial affect recognition accuracy with 26 errors while individuals who used cocaine and alcohol made the least with 4 errors. Individuals with substance use disorders tended to interpret sad faces as the facial affect of anger and fear, angered faces as the facial affect of happiness, and fearful faces as the facial affect of happiness. A reasonable explanation for this may be that most errors occurred when the facial affect was displayed at a low intensity, therefore making it more difficult to accurately recognize. Another explanation for this may be that individuals with substance use disorders have learned to interpret faces of anger and fear as happiness as a protective factor during childhood to help serve as a buffer.

The current results are consistent with previous studies. For example, Townshend and Duka (2003) and Hoshi et al. (2004) found that individuals with alcohol and MDMA use disorders overestimated the intensity of emotion in facial affect recognition with the affects of fear and anger. Additionally, Kornreich et al. (2001) found facial affect recognition impairment in recognizing anger but also found impairment in happiness, which this study did not support.

This difference may be explained by the limited sample used in this explorative study or by the substances used. Although there are relatively few studies on facial affect recognition and individuals with substance use disorders, the evidence suggests that individuals with substance use disorders have a reduced ability to perceive and experience emotions.

Study limitations

The findings of this exploratory study should be viewed in the context of the study's methodological limitations. This study is limited in its sample size. Therefore, results should not be used to generalize these findings. Additionally, it was not possible to match the subjects in different groups for age or education level. Individuals with substance use disorders vary in age and matching them could thus create a bias, isolating particular subpopulations. However, neither age nor education level have influenced facial affect recognition accuracy in other studies (Kornreich et al., 2001). It must also be noted, that the small sample precludes any firm conclusion regarding facial affect recognition accuracy in individuals with substance use disorders.

Additionally, the researcher did not use cognitive measures as norm measures. Other cognitive variables could co-vary with facial affect recognition accuracy errors or serve as mediating factors. However, the interest of this study was to explore facial affect recognition accuracy in individuals with substance use disorders.

Implications of findings for future research, practice, and administration

The result of this study has both theoretical and clinical implications. The impairment in facial affect recognition accuracy in individuals with substance use disorders parallels the

formulations of the somatic marker theory (Verdejo-García & Bechara, 2009), which posits a key role of facial affect recognition accuracy in substance use disorders. Furthermore, impairments of facial affect recognition accuracy may be linked to clinical functioning and risk of relapse in individuals with substance use disorders. Alterations in the recognition of anger and sadness are related to clinical symptoms of apathy, depression, aggression, hostility, which are enhanced during craving and serve as proxy to relapse (Fernández-Serrano, Lozano, Pérez-García, & Verdejo-García, 2010). Similarly, alterations of fear processing can impair adequate treatment categorization and recognition of risky scenarios (Fernández-Serrano, Lozano, Pérez-García, & Verdejo-García, 2010), one of the main targets of relapse prevention treatment. Lastly, overall impairment in facial affect recognition accuracy may effect adaptive decision-making (Verdejo-García & Bechara, 2007), a reliable marker of drug relapse. The results should be examined in future studies with a larger sample size, exploring the variation of the impairment across other facial affects, as well as using more sophisticated research design. These future studies should also rule out some possible alternative explanations, notably the possibility that facial affect recognition accuracy may be partially explained by general cognitive deficits present in individuals with substance use disorders.

Conclusion

Neuropsychological studies have demonstrated extensive mid- and long-term cognitive alterations in individuals with substance use disorders, but there has been disproportionately less research on the neuropsychology of emotional alterations associated with substance use disorders (Fernández-Serrano et al., 2010). Research shows that satisfactory interpersonal interaction involves understanding others' facial expressions. There is research into facial affect recognition

accuracy in individuals with alcohol use disorders showing that they have a tendency to overestimate the intensity of certain emotions (Fernández-Serrano et al., 2010), but there has been a lack of research on individuals with other substance use disorders. One of the key aspects of adaptive emotional functioning is the ability to decode emotional cues and recognize emotions in the faces of others, especially in relation to the four basic emotions: anger, fear, happiness, and sadness (Adolphs, 2002).

Facial expressions of emotion provide a means of communicating and obtaining information about one's social environment and provide cues to interpersonal exchanges. Individuals with substance use disorders often have severe interpersonal difficulties that may relate to poor and distorted perception of facial expression (Frigerio, Burt, Montagne, Murray, & Perrett, 2002). This study revealed that individuals with substance use disorders can have impaired facial affect recognition accuracy. These findings may have clinical significance in the treatment of substance use disorders and relapse prevention in the future.

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APPENDIX A: IRB approval, informed consent, & demographics survey



University and Medical Center Institutional Review Board
East Carolina University • Brody School of Medicine
600 Moye Boulevard • Old Health Sciences Library, Room 1L-09 • Greenville, NC 27834
Office 252-744-2914 • Fax 252-744-2284 • www.ecu.edu/irb
Chair and Director of Biomedical IRB: L. Wiley Nifong, MD
Chair and Director of Behavioral and Social Science IRB: Susan L. McCammon, PhD

TO: Paul Toriello, RhD, Department of Rehabilitation Studies, ECU

FROM: UMCIRB 

DATE: August 18, 2009

RE: Expedited Continuing Review of a Research Study

TITLE: "Project Working Recovery (PWR)"

UMCIRB #07-0455

The above referenced research study was initially reviewed and approved by expedited review on 7/24/07. This research study has undergone a subsequent continuing review using expedited review on 8/9/09. This research study is eligible for expedited review because it is research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. (NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b)(3). This listing refers only to research that is not exempt.). The Chairperson (or designee) deemed this **KBR Charitable Trust** sponsored study **no more than minimal risk** requiring a continuing review in **12 months**. Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The investigator must adhere to all reporting requirements for this study.

The above referenced research study has been given approval for the period of 8/9/09 to 8/8/10. The approval includes the following items:

- Continuing Review Form (dated 6/18/09)
- Protocol Summary (dated 12/29/08)
- Informed Consent: General (dated 12/29/08)
- Informed Consent: PORT (dated 12/29/08)
- Informed Consent: WBJ (dated 12/29/08)
- Change Questionnaire
- Addiction Severity Index

The Chairperson (or designee) does not have a conflict of interest on this study.

The UMCIRB applies 45 CFR 46, Subparts A-D, to all research reviewed by the UMCIRB regardless of the funding source. 21 CFR 50 and 21 CFR 56 are applied to all research studies under the Food and Drug Administration regulation. The UMCIRB follows applicable International Conference on Harmonisation Good Clinical Practice guidelines.

CONSENT DOCUMENT (General)

Title of Research Study: Project Working Recovery (PWR))
Principal Investigator: Paul J. Toriello, RhD
Institution: East Carolina University
Address: Department of Rehabilitation Studies, School of Allied Health Sciences
4425L Health Sciences Bldg.
Greenville, NC 27858-4353
Telephone #: 252-744-6297

INTRODUCTION

You have been asked to participate in a research study being conducted by Paul J. Toriello with East Carolina University. The purpose of this study is to evaluate the impact of employment and employment related issues on your treatment and recovery from substance abuse. As a participant in Project Working Recovery (PWR) you will have the following opportunities.

- (a) Complete surveys that measure issues surrounding your substance abuse. These issues include employment, medical, legal, psychological, and motivation.
- (b) *If you are unemployed*, you can participate in a 30-hour employment counseling intervention intended to help you find and keep a job, as well as support your recovery.

PLAN AND PROCEDURES

If you are NOT eligible for the employment counseling:

1. If you choose to participate you will first complete the above surveys.
2. After about 120 days, you will be contacted to complete the surveys again, over the phone or by mail.
3. Finally, after another 90-days, you will be contacted to complete the surveys one last time, again over the phone, or by mail.

If you are eligible for the employment counseling:

1. If you choose to participate you will first complete the above surveys.
2. You will then attend 3 counseling sessions per week for about five weeks at the PWR Clinic located in ECU's Department of Rehabilitation Studies (DRS). The purpose of the counseling sessions will be to help you with job searching, job interviewing, as well as keeping a job during your recovery. With your consent, these counseling sessions will be observed live, via a camera, from a hidden observation room as well as videotaped. The observation and video tapes will only be of the case manager: *your face will not be on camera or recorded*. The observations and video recordings will be strictly used for supervision and evaluation of the PWR case managers.
3. After about 30 days, you will be contacted to complete the surveys again in person at the PWR clinic, over the phone, or by mail.
4. After an additional 90-days, you will be contacted to complete the surveys again in person at the PWR clinic, over the phone, or by mail.
5. Finally, after another 90-days, you will be contacted to complete the surveys one last time, again in person at the PWR clinic, over the phone, or by mail.

POTENTIAL RISKS AND DISCOMFORTS

Risks to study participants include unanticipated emotional reactions from completing the surveys and/or counseling sessions. You may terminate the surveys and/or counseling session at any time.

POTENTIAL BENEFITS

By participating in PWR, our goal is to understand how employment impacts your recovery from substance abuse, as well as increase your employment functioning.

SUBJECT PRIVACY AND CONFIDENTIALITY OF RECORDS

To protect your confidentiality, you will be assigned a five digit project number; this will allow us to track all surveys you have completed. All project data will be secured in a locked filing cabinet or secured computers within the DRS. **Please note there are limitations to the protection of your confidentiality. Specifically, PWR staff will be required to contact the local authorities if they believe you are a imminent threat to hurting yourself and/or another individual. Also, local authorities will be contacted if PWR staff suspect there is child abuse occurring within your home.**

Version 122908 General

UMCIRB
APPROVED
FROM 8-9-09
TO 8-8-10

Unique Identifier: Toriello PWR Evaluation

COSTS OF PARTICIPATION

There is no cost to participate in this project.

COMPENSATION

You are eligible for incentives when you participate in PWR activities. Specifically, when you participate in PWR activities you will receive incentives in the form of McDonald's gift cards and/or Greenville Area bus passes.

Please note that one incentive, whether it is a McDonald's gift card, or bus pass has a \$6 value.

If you are NOT eligible for the employment counseling you will receive:

- Two incentives when you complete the initial baseline survey; and
- Two incentives each time you complete follow-up surveys.

If you are eligible for the employment counseling you will receive:

- Two incentives when you complete the initial baseline survey;
- Two incentives each time you complete follow-up surveys;
- Two incentives when you attend your intake session at the PWR clinic;
- Two incentives for every three hours of services completed at the PWR clinic (maximum of 9 hours per week).

COMPENSATION FOR INJURY

The policy of East Carolina University and/or Pitt County Memorial Hospital does not provide payment or medical care for research participants because of physical or other injury that result from this research study. Every effort will be made to make the facilities of the School of Medicine and Pitt County Memorial Hospital available for care in the event of injury. You do not give up any legal rights as a research participant by signing this consent form.

VOLUNTARY PARTICIPATION

Participating in this study is voluntary. If you decide not to be in this study after it has already started, you may stop at any time without losing benefits that you should normally receive. You may stop at any time you choose without penalty or without causing a problem with your receipt of the incentives for completing the surveys.

PERSONS TO CONTACT WITH QUESTIONS

The investigators will be available to answer any questions concerning this research, now or in the future. You may contact the principal investigator, Paul J. Toriello at phone numbers 252-744-6297 (days) or 252-561-5703 (nights and weekends). If you have questions about your rights as a research subject, you may call the Chair of the University and Medical Center Institutional Review Board at phone number 252-744-2914 (days) and/or the ECU Risk Management Office at 252-328-6858.

Version 122908 General

UMCIRB
APPROVED
FROM 8-9-09
TO 8-8-10

Unique Identifier: Toriello PWR Evaluation

CONSENT TO PARTICIPATE

Title of research study: Project Working Recovery (PWR)

I have read all of the above information, asked questions and have received satisfactory answers in areas I did not understand. (A copy of this signed and dated consent form will be given to the person signing this form as the participant or as the participant authorized representative.)

Please indicate which parts of the study you are willing to participate in by checking "yes" next to those parts and check "no" next to the parts you are not willing to participate in. Please check N/A for those parts for which you are not eligible. Please note that you can still withdrawal from any part of the study at any time, regardless of your response below.

- | | | | |
|--|----------|---------|----------|
| a) Survey Completion | Yes_____ | No_____ | |
| b) Employment Counseling Sessions at DRS | Yes_____ | No_____ | N/A_____ |
| c) Employment Counseling Session Observation & Recording | Yes_____ | No_____ | N/A_____ |

Participant's Name (PRINT)	Signature	Date	Time
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If applicable:

Guardian's Name (PRINT)	Signature	Date	Time
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PERSON ADMINISTERING CONSENT: I have conducted the consent process and orally reviewed the contents of the consent document. I believe the participant understands the research.

Person Obtaining consent (PRINT)	Signature	Date
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Principal Investigator's (PRINT)	Signature	Date
----------------------------------	-----------	------

Version 122908 General

UMCIRS
APPROVED
FROM 8-9-09
TO 8-8-10

Unique Identifier: Toriello PWR Evaluation

CONSENT DOCUMENT (PORT)

Title of Research Study: Project Working Recovery (PWR))
Principal Investigator: Paul J. Toriello, RhD
Institution: East Carolina University
Address: Department of Rehabilitation Studies, School of Allied Health Sciences
4425L Health Sciences Bldg.
Greenville, NC 27858-4353
Telephone #: 252-744-6297

INTRODUCTION

You have been asked to participate in a research study being conducted by Paul J. Toriello with East Carolina University. The purpose of this study is to evaluate the impact of employment and employment related issues on your treatment and recovery from substance abuse. As a participant in Project Working Recovery (PWR) you will have the following opportunities.

- (a) Complete surveys that measure issues surrounding your substance abuse. These issues include employment, medical, legal, psychological, and motivation.
- (b) If you are unemployed, you can participate in a 30-hour employment counseling intervention intended to help you find and keep a job, as well as support your recovery.

PLAN AND PROCEDURES

If you are NOT eligible for the employment counseling:

1. If you choose to participate you will first complete the above surveys.
2. After about 120 days, you will be contacted to complete the surveys again, in person at PORT, over the phone, or by mail.
3. Finally, after another 90-days, you will be contacted to complete the surveys one last time, again in person at PORT, over the phone, or by mail.

If you are eligible for the employment counseling:

1. If you choose to participate you will first complete the above surveys.
2. You will then attend 2-3 counseling sessions per week for five weeks at the PWR Clinic located in ECU's Department of Rehabilitation Studies (DRS). The purpose of the counseling sessions will be to help you with job searching, job interviewing, as well as keeping a job during your recovery. With your consent, these counseling sessions will be observed live, via a camera, from a hidden observation room as well as videotaped. The observation and video tapes will only be of the case manager: *your face will not be on camera or recorded*. The observations and video recordings will be strictly used for supervision and evaluation of the PWR case managers.
3. After about 30 days, you will be contacted to complete the surveys again in person at PORT, over the phone, or by mail.
4. After an additional 90-days, you will be contacted to complete the surveys again in person at the PWR clinic, over the phone, or by mail.
5. Finally, after another 90-days, you will be contacted to complete the surveys one last time, again in person at the PWR clinic, over the phone, or by mail.

POTENTIAL RISKS AND DISCOMFORTS

Risks to study participants include unanticipated emotional reactions from completing the surveys and/or counseling sessions. You may terminate the surveys and/or counseling session at any time.

POTENTIAL BENEFITS

By participating in PWR, our goal is to understand how employment impacts your recovery from substance abuse, as well as increase your employment functioning.

SUBJECT PRIVACY AND CONFIDENTIALITY OF RECORDS

To protect your confidentiality, you will be assigned a five digit project number; this will allow us to track all surveys you have completed. All project data will be secured in a locked filing cabinet or secured computers within the DRS.

Version 122908 PORT

UMCIRS
APPROVED
FROM 8-9-09
TO 8-8-10

Unique Identifier: Toriello PWR Evaluation

Please note there are limitations to the protection of your confidentiality. Specifically, PWR staff will be required to contact the local authorities if they believe you are a imminent threat to hurting yourself and/or another individual. Also, local authorities will be contacting if PWR staff suspect there is child abuse occurring within your home.

COSTS OF PARTICIPATION

There is not cost to participate in this project.

COMPENSATION

You are eligible for incentives when you participate in PWR activities. Incentives include vouchers for a dose a methadone at PORT, McDonald's gift cards, or Greenville Area bus passes. Please note that one incentive, whether it is a voucher, a McDonald's gift card, or bus pass has a \$6 value.

If you are NOT eligible for the employment counseling you will receive:

- Two incentives when you complete the initial baseline survey; and
- Two incentives each time you complete follow-up surveys.

If you are eligible for the employment counseling you will receive:

- Two incentives when you complete the initial baseline survey;
- Two incentives each time you complete follow-up surveys;
- Two incentives when you attend your intake session at the PWR clinic;
- Two incentives for every three hours of services completed at the PWR clinic (maximum of 9 hours per week).

COMPENSATION FOR INJURY

The policy of East Carolina University and/or Pitt County Memorial Hospital does not provide payment or medical care for research participants because of physical or other injury that result from this research study. Every effort will be made to make the facilities of the School of Medicine and Pitt County Memorial Hospital available for care in the event of injury. You do not give up any legal rights as a research participant by signing this consent form.

VOLUNTARY PARTICIPATION

Participating in this study is voluntary. If you decide not to be in this study after it has already started, you may stop at any time without losing benefits that you should normally receive. You may stop at any time you choose without penalty or without causing a problem with your receipt of the gift cards or vouchers for completing the surveys.

PERSONS TO CONTACT WITH QUESTIONS

The investigators will be available to answer any questions concerning this research, now or in the future. You may contact the principal investigator; Paul J. Toriello at phone numbers 252-744-6297 (days) or 252-561-5703 (nights and weekends). If you have questions about your rights as a research subject, you may call the Chair of the University and Medical Center Institutional Review Board at phone number 252-744-2914 (days) and/or the ECU Risk Management Office at 252-328-6858.

Version 122908 PORT

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Unique Identifier: Toriello PWR Evaluation

CONSENT TO PARTICIPATE

Title of research study: Project Working Recovery (PWR)

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Please indicate which parts of the study you are willing to participate in by checking "yes" next to those parts and check "no" next to the parts you are not willing to participate in. Please check N/A for those parts for which you are not eligible. Please note that you can still withdrawal from any part of the study at any time, regardless of your response below.

- | | | | |
|--|---------|--------|---------|
| a) Survey Completion | Yes____ | No____ | |
| b) Employment Counseling Sessions at DRS | Yes____ | No____ | N/A____ |
| c) Employment Counseling Session Observation & Recording | Yes____ | No____ | N/A____ |

Participant's Name (PRINT)	Signature	Date	Time
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If applicable:

Guardian's Name (PRINT)	Signature	Date	Time
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PERSON ADMINISTERING CONSENT: I have conducted the consent process and orally reviewed the contents of the consent document. I believe the participant understands the research.

Person Obtaining consent (PRINT)	Signature	Date
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Principal Investigator's (PRINT)	Signature	Date
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Version 122908 PORT

UMCIRB
APPROVED
FROM 8-9-09
TO 8-8-10

Unique Identifier: Toriello PWR Evaluation

CONSENT DOCUMENT (WBJ)

Title of Research Study: Project Working Recovery (PWR))

Principal Investigator: Paul J. Toriello, RhD

Institution: East Carolina University

Address: Department of Rehabilitation Studies, School of Allied Health Sciences
4425L Health Sciences Bldg.
Greenville, NC 27858-4353

Telephone #: 252-744-6297

INTRODUCTION

You have been asked to participate in a research study being conducted by Paul J. Toriello with East Carolina University. The purpose of this study is to evaluate the impact of employment and employment related issues on your treatment and recovery from substance abuse. As a participant in Project Working Recovery (PWR) you will have the following opportunities.

- (a) Complete surveys that measure issues surrounding your substance abuse. These issues include employment, medical, legal, psychological, and motivation.
- (b) *If you are unemployed*, you can participate in a 30-hour employment counseling intervention intended to help you find and keep a job, as well as support your recovery.

PLAN AND PROCEDURES

If you are NOT eligible for the employment counseling:

1. If you choose to participate you will first complete the above surveys.
2. After about 120 days, you will be contacted to complete the surveys again, in person at WBJ, over the phone, or by mail.
3. Finally, after another 90-days, you will be contacted to complete the surveys one last time, again in person at WBJ, over the phone, or by mail.

If you are eligible for the employment counseling:

1. If you choose to participate you will first complete the above surveys.
2. You will then attend 2-3 counseling sessions per week for about five weeks at the PWR Clinic located in ECU's Department of Rehabilitation Studies (DRS). The purpose of the counseling sessions will be to help you with job searching, job interviewing, as well as keeping a job during your recovery. With your consent, these counseling sessions will be observed live, via a camera, from a hidden observation room as well as videotaped. The observation and video tapes will only be of the case manager: *your face will not be on camera or recorded*. The observations and video recordings will be strictly used for supervision and evaluation of the PWR case managers.
3. After about 30 days, you will be contacted to complete the surveys again in person at WBJ, over the phone, or by mail.
4. After an additional 90-days, you will be contacted to complete the surveys again in person at the PWR clinic, over the phone, or by mail.
5. Finally, after another 90-days, you will be contacted to complete the surveys one last time, again in person at the PWR clinic, over the phone, or by mail.

POTENTIAL RISKS AND DISCOMFORTS

Risks to study participants include unanticipated emotional reactions from completing the surveys and/or counseling sessions. You may terminate the surveys and/or counseling session at any time.

POTENTIAL BENEFITS

By participating in PWR, our goal is to understand how employment impacts your recovery from substance abuse, as well as increase your employment functioning.

SUBJECT PRIVACY AND CONFIDENTIALITY OF RECORDS

To protect your confidentiality, you will be assigned a five digit project number; this will allow us to track all surveys you have completed. All project data will be secured in a locked filing cabinet or secured computers within the DRS.

Please note there are limitations to the protection of your confidentiality. Specifically, PWR staff will be required to contact the local authorities if they believe you are a imminent threat to hurting yourself and/or another individual. Also, local authorities will be contacted if PWR staff suspect there is child abuse occurring within

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your home.

COSTS OF PARTICIPATION

There is no cost to participate in this project.

COMPENSATION

You are eligible for incentives when you participate in PWR activities. Specifically, when you participate in PWR activities as a *Walter B. Jones patient* you will receive incentives in the form of vouchers; each voucher is worth \$6. These vouchers will be kept by Walter B. Jones staff. Upon your discharge from Walter B. Jones, you will be given the full amount of all your earned vouchers in the form of a gift card to stores where you can buy needed items for your child or children (e.g., Baby's-R-Us, Wal-Mart).

When you are participating in PWR activities but are *NOT* a Walter B. Jones patient you will receive incentives in the form of McDonald's gift cards and/or Greenville Area bus passes.

Please note that one incentive, whether it is a voucher, a McDonald's gift card, or bus pass has a \$6 value.

If you are NOT eligible for the employment counseling you will receive:

- Two incentives when you complete the initial baseline survey; and
- Two incentives each time you complete follow-up surveys.

If you are eligible for the employment counseling you will receive:

- Two incentives when you complete the initial baseline survey;
- Two incentives each time you complete follow-up surveys;
- Two incentives when you attend your intake session at the PWR clinic;
- Two incentives for every three hours of services completed at the PWR clinic (maximum of 9 hours per week).

COMPENSATION FOR INJURY

The policy of East Carolina University and/or Pitt County Memorial Hospital does not provide payment or medical care for research participants because of physical or other injury that result from this research study. Every effort will be made to make the facilities of the School of Medicine and Pitt County Memorial Hospital available for care in the event of injury. You do not give up any legal rights as a research participant by signing this consent form.

VOLUNTARY PARTICIPATION

Participating in this study is voluntary. If you decide not to be in this study after it has already started, you may stop at any time without losing benefits that you should normally receive. You may stop at any time you choose without penalty or without causing a problem with your receipt of the incentives for completing the surveys.

PERSONS TO CONTACT WITH QUESTIONS

The investigators will be available to answer any questions concerning this research, now or in the future. You may contact the principal investigator; Paul J. Toriello at phone numbers 252-744-6297 (days) or 252-561-5703 (nights and weekends). If you have questions about your rights as a research subject, you may call the Chair of the University and Medical Center Institutional Review Board at phone number 252-744-2914 (days) and/or the ECU Risk Management Office at 252-328-6858.

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CONSENT TO PARTICIPATE

Title of research study: Project Working Recovery (PWR)

I have read all of the above information, asked questions and have received satisfactory answers in areas I did not understand. (A copy of this signed and dated consent form will be given to the person signing this form as the participant or as the participant authorized representative.)

Please indicate which parts of the study you are willing to participate in by checking "yes" next to those parts and check "no" next to the parts you are not willing to participate in. Please check N/A for those parts for which you are not eligible. Please note that you can still withdrawal from any part of the study at any time, regardless of your response below.

- | | | | |
|--|------------------------------|-----------------------------|------------------------------|
| a) Survey Completion | Yes ☐ | No ☐ | |
| b) Employment Counseling Sessions at DRS | Yes ☐ | No ☐ | N/A ☐ |
| c) Employment Counseling Session Observation & Recording | Yes ☐ | No ☐ | N/A ☐ |

Participant's Name (PRINT)	Signature	Date	Time
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If applicable:

Guardian's Name (PRINT)	Signature	Date	Time
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PERSON ADMINISTERING CONSENT: I have conducted the consent process and orally reviewed the contents of the consent document. I believe the participant understands the research.

Person Obtaining consent (PRINT)	Signature	Date
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Principal Investigator's (PRINT)	Signature	Date
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Demographics Survey

PLEASE CHOOSE THE BEST ANSWER.

Gender

What is your gender?

Male

Female

Age

In what year were you born? 19 _____

Education

What is the highest level of education you completed?

Elementary school only

Some high school, but did not finish

Completed high school

Some college, but did not finish

Two-year college degree / A.A / A.S.

Four-year college degree / B.A. / B.S.

Some graduate work

Completed Masters or professional degree

Advanced Graduate work or Ph.D.

Employment

How would you describe your current employment status?

Employed full time

Employed part time

Unemployed / Looking for work

Student

Homemaker

Retired

Racial/Ethnic Identity

Would you describe yourself as:

American Indian / Native American

Asian

Black / African American

Hispanic / Latino

Pacific Islander

White / Caucasian

Other _____

Income

What do you expect your 2010 family income from all sources before taxes to be?

Under \$25,000

\$25,000 - \$39,999

\$40,000 - \$49,999

\$50,000 - \$74,999

\$75,000 - \$99,999

\$100,000 - \$124,999

\$125,000 - \$149,999

Over \$150,000

Children

Do you have any children? Yes No

If yes, how many children do you have? _____

Thank you for completing this survey!