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The Juvenile Addiction Risk Rating
For Use in Vocational Rehabilitation

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Rehabilitation

by

Paul Tyler Hickerson
University of Arkansas
Bachelor of Arts in Psychology, 1996
University of Arkansas
Master of Science in Rehabilitation Counseling, 2006

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University of Arkansas

This dissertation is approved for recommendation to the Graduate Council.

_____
Dr. Brent T. Williams
Dissertation Director

_____
Dr. Stephany Lusk
Committee Member

_____   _____
Dr. Rebecca Wiewel   Dr. John Sassin
Committee Member   Ex-Officio

ABSTRACT

The prevalence of substance use among adolescents warrants considerable concern since it often has detrimental effects on an individual's physical and mental health, and correlates with worsened social, physical, and employment outcomes. Research shows that adolescents with disabilities are especially susceptible to the development of substance use disorders. To address this concern and to ensure accurate rehabilitation service planning, effective screening for substance use risk is necessary. Unfortunately, the most common screening instruments for adolescent substance use rely on information obtained solely from self-report. This type of data, although useful, is also susceptible to inaccuracies due to such factors as client malingering, memory errors, and denial. These confounds propelled the development of the Juvenile Addiction Risk Rating, a 10-item instrument that rates the severity of an adolescent's risk for substance addiction based on data collected from collateral sources as opposed to data collected solely from self-report. However, it had not been validated for use in vocational rehabilitation. This investigation presented 39 certified rehabilitation counselors with three vignettes depicting individuals of low, moderate, and high risk of substance use disorder with instructions to score a Juvenile Addiction Risk Rating (JARR) based on the information within the vignettes. This study also investigated whether statistical differences of JARR total scores were present between males and females, and ethnicities represented as Black/African American, White/Caucasian, Hispanic, and Other. Overall, the certified rehabilitation counselors scored with 95.73% accuracy, correctly scoring 112 of the 117 vignettes. An independent samples t-test found no statistical difference in mean total scores among males and females, but a one-way ANOVA, and post hoc Tukey HSD found a statistical difference of mean total scores between White/Caucasian and Hispanic ethnicities, but with a small effect size.

ACKNOWLEDGEMENTS

Above all I am compelled to thank my mother, Joan Ingram Hickerson, whose continued encouragement and self-sacrifice throughout the years made the complete this endeavor possible.

I also extend heartfelt appreciation to the members of my dissertation committee, Dr. Brent Williams, Dr. Stephanie Lusk, Dr. Rebecca Wiewel, and Dr. John Sassin, who made the most feared day of my academic career a rather pleasant experience.

Special gratitude is due Dr. Michael Powell who continually demonstrated patience and an uncanny ability for clarification when bombarded with my questions regarding the psychometrics of his Juvenile Addiction Risk Rating, on which this research is based.

Thanks go to Dr. James Quinn for introducing me to the field of vocational rehabilitation and helping me find the means to actively pursue my academic goals.

Other influential individuals to whom I express sincere appreciation include Dr. Richard Roessler, Dr. Ron Freeman, Sensei Isao Sagura, Ms. Virginia Hymes, and Dr. John R. Locke.

Finally, I would like to thank my wife Tomoko for her unconditional support throughout this venture.

DEDICATION

This dissertation is dedicated to my daughters Yuki Noel and Pixie Hotaru.

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Chapter 1: Introduction

According to the National Survey on Drug Use and Health (Center for Substance Abuse Treatment, 2014), nearly 2.3 million teenage Americans aged 12 to 17 use illicit substances. Drug abuse affects an adolescent's emotional and physiological development, often resulting in slower cognitive processing, increased violence and aggression, and impairments in social and vocational functioning (Ali et al ., 2011; Jacobus et al., 2015). Among these youths, many will experience subsequent legal difficulties, as half of all incarcerated adolescents report addiction issues (Miller, 1995).

Despite CSAT (2014) providing some illuminating data in regards to the extent of adolescent substance use having decreased overall for most substances, the drop is not dramatic. The reality is that the use of illicit drugs and alcohol continues to present a problem for the general community. This is evident in increasing health and crime-related costs (NIDA, 2012). It is estimated that substance-related problems cost Americans more than $600 billion each year (SAMHSA, 2014a). Yet the toll on the individual is even more ruinous, with impacts on the family unit, decreases in academic retention, and increases in delinquency.

It is no surprise that teenage drug experimentation is common. Arguably, as a developmental life task during the transition from childhood to adulthood, many youth will at some point try an illicit substance (Feldstein & Miller, 2006). What is sobering, however, is the rate of abuse among this population already known for risk taking and poor decision making. Among the 2.3 million youth reportedly using or experimenting with substance use, roughly around nine-percent (9%) of the population, approximately 1.3 million (5%), will develop a substance use disorder (SUD), which warrants the need for significant intervention to prevent the

problems inherent in chemical dependency from being a greater problem for these individuals (CSAT, 2014). Therefore, early detection of substance misuse is vital.

Early detection of substance-related issues among at-risk youth is paramount to decreasing the pervasive consequences of drug use on one's functioning and preventing the development of an SUD (CSAT, 2012). Using screening procedures immediately at intake, for example, will ensure that youth identified as having a need will most likely get further evaluation to identify the source of the problem and subsequent treatment. In contrast, ignoring the existence or impact of drug use or avoiding drug abuse screening at intake could have serious ramifications.

Accurate screening of adolescent substance use is especially crucial for the vocational rehabilitation (VR) practitioner helping adolescents and young adults successfully transition to the world of work. Without screening and intervention, deficiencies resulting from substance abuse could make "it more difficult [for youth] to negotiate the demands of transition from early adolescence to late adolescence to young adulthood," [leaving them] "woefully unprepared for the demands of adult life" (CSAT, 1999a, p. 1). The purpose of screening is to identify whether more comprehensive assessment and treatment is required (CSAT, 1999a). In the vocational rehabilitation setting, screening is most often used to identify potential barriers to individuals seeking gainful employment. In the event substance use disorders or substance-related impairments are identified, a VR professional can make a referral for assessment and subsequent counseling to minimize impact on the client's ability to work. Considering the typical caseload of a VR counselor (at times, well over 100 clients), having a screening instrument that is user-friendly and brief, yet reliable and effective, would be essential.

Unfortunately, most of the screening instruments for juvenile substance use rely on self-report information. Powell and Newgent (2016) established that dependence on such data has its disadvantages, particularly in adolescent substance abuse treatment. For example, youth may underreport their drug use or self-reported information may be inconsistent with information presented by the family (Winters, 2004). It is also common for adolescents to not recognize that they have a substance use problem and/or deny the extent of their use for fear of repercussions (Horrigan, Piazza, & Weinstein, 1996; Hoskin, 2012; Richter & Johnson, 2001).

In order to improve the substance use screening process by not having to rely on data that may be inconsistent or shallow, Powell and Newgent (2016) developed the Juvenile Addiction Risk Rating (JARR) as a complement to already established screening tools such as the Subtle Substance Abuse Screening Inventory – Adolescent 2 (SASSI-A2; Miller, 1997). The JARR (see Appendix A) is a two-page instrument consisting of 10 Likert-type items and is an improvement on popular methods of juvenile risk assessment because it relies on collateral data (e.g., medical records, court documents, school records, etc.) that focus on the most significant risk factors predictive of youth alcohol and drug addiction as found in the literature.

Powell (2015) argued that the JARR would improve substance use screening and offer service providers additional support when making treatment decisions. He asserted that this is possible as the JARR "is as free as possible from the confounds of self-report data by investigating whether an adolescent meets a risk criterion for juvenile substance addiction based on his or her psychosocial history, not on the youth's mistaken or biased belief about his or her own pattern of use" (p. 5). And, since "a fundamental truth in the field of assessment is that past behavior is the best predictor of future behavior" (Miller, 1995, p. 49), it seems clear that clinicians could utilize the JARR to either confirm any initial impressions that may have been

obtained through referral sources, or from the information obtained from the client and family at intake, or to improve their clinical judgment as to the inaccuracy, inconsistency or lack of completeness of these sources.

Statement of the Problem

Early detection of substance use disorders (SUDs) in adolescence is vital because early intervention has been found to have the greatest success in preventing addiction (Substance Abuse and Mental Health Services Administration, 2012). Typically utilized during intake in mental health and vocational settings, screening instruments can be effective tools for accomplishing this. Unfortunately several limitations exist when data are obtained via self- and parent-report, because such information may be found to be inconsistent, insufficient, and confounded by denial, malingering and/or defensiveness.

One solution suggested by Powell and Newgent (2016) is the use of collateral data during substance use screenings when confounding information is present. Consisting of 10 prominent factors that predict juvenile addiction as found via a content analysis of the relevant and reputable substance use literature, the JARR was developed by Powell and Newgent (2016) to help determine the likelihood that a youth would be at risk for SUD via information from collateral sources (e.g., school and psychological reports).

According to the National Survey on Drug Use and Health (Center for Substance Abuse Treatment, 2014), nearly 2.3 million teenage Americans aged 12 to 17 use illicit substances. Drug abuse affects an adolescent's emotional and physiological development, often resulting in slower cognitive processing, increased violence and aggression, and impairments in social and vocational functioning (Ali et al ., 2011; Jacobus et al., 2015). Among these youths, many will

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Unfortunately, most of the screening instruments for juvenile substance use rely on self-report information. Powell and Newgent (2016) established that dependence on such data has its disadvantages, particularly in adolescent substance abuse treatment. For example, youth may underreport their drug use or self-reported information may be inconsistent with information presented by the family (Winters, 2004). It is also common for adolescents to not recognize that they have a substance use problem and/or deny the extent of their use for fear of repercussions (Horrigan, Piazza, & Weinstein, 1996; Hoskin, 2012; Richter & Johnson, 2001).

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At this time, however, the JARR has only been shown to be useful in the field of mental health and has not been validated for use in the vocational rehabilitation (VR) setting. Since a significant percentage of VR consumers are estimated to have a co-occurring SUD, and considering the detrimental effects the presence of an SUD might have on finding, obtaining, and maintaining employment, it is logical to assume that the JARR might be a useful tool for VR counselors serving juveniles.

Purpose and Significance of the Study

Screening is vital to early detection and prevention of substance use problems in youth and is a necessary part of the mental health assessment process. With regard to vocational rehabilitation, Rubin and Roessler (2001) noted that treatment planning is inherently dependent on accurate assessment. Since a central edict in the development of VR treatment planning is correct assessment of individual strengths and potential barriers such as substance use (Heinemann, Moore, Lazowski, Huber, & Semik, 2014), it stands to reason that the JARR, being free of the potential error inherent to self-report measures, would contribute to improving assessment methods used in the determination of appropriate service provision. As Powell and

Newgent (2016) have attempted to improve the screening process by validating the JARR in the field of mental health and substance use treatment, this study investigated whether the JARR might serve as a useful tool in the VR setting. This study built on Powell and Newgent's (2016) findings by investigating whether certified rehabilitation counselors could accurately identify adolescents as being at low, moderate, or high risk for addiction based on the JARR's administration and scoring rules. In addition, this study investigated whether differences exist in regard to sex and ethnicity to determine if the JARR is externally valid, and thus does not require the generation of separate scoring and interpretation rules based on a person's demographic data.

General Research Questions and Hypotheses

Reliability estimates during the initial development of the JARR were obtained solely from data collected from various professionals working closely with the adolescent population. Thus, it could not be determined if the JARR might be useful and accurate when used in VR settings, or whether VR counselors could accurately score the JARR. Furthermore, the original study found that no significant differences existed in regards to sex ($N = 313$), prompting this study to investigate whether this finding was true with an increased sample size ($N = 989$). Finally, the original study did not consider whether differences existed in regard to varying ethnicity. This study investigated whether differences existed in regard to ethnicity as represented by Black/African American, Hispanic, White/Caucasian, and a group labeled "Other" comprised of individuals of varied ethnic minority backgrounds not significantly represented within the sample. The following research questions were examined:

1. Would the JARR have statistically significant inter-rater reliability among CRCs?

2. Does the JARR continue to evidence no difference in sex when a larger sample size is used, and if there is a significant difference, is the effect size significant enough to

warrant new scoring rules for the populations that might be found to have differences in Total Risk Score?

3. Will the JARR evidence any differences in regards to ethnic category, and if there are significant differences, are the effect sizes significant enough to warrant new scoring rules for the populations that might be found to have differences in Total Risk Score?

With these general research questions in mind, the following hypotheses were investigated:

Hypothesis 1. Just as Powell and Newgent (2016) found remarkably high inter-rater reliability among mental health professionals, CRCs serving in varying positions within the field of vocational rehabilitation, with no specialized training in how to do so, will also accurately score the JARR to three vignettes of cases representing low, moderate and high levels of risk.

Hypothesis 2. An analysis of the larger sample size ($N = 989$) will support the findings of Powell and Newgent (2016) that no significant difference is present in the total scoring outcomes on the JARR in regard to an individual's sex.

Hypothesis 3. There will not be a significant difference in total scoring outcomes on the JARR in regard to ethnicity.

Underlying Assumptions and Design Controls

In terms of the treatment of adolescents experiencing a substance use disorder (SUD), this study made the same assumptions as did Powell and Newgent (2016). These included recognition that a juvenile's development of an SUD is influenced by a cluster of interacting variables; that the development of an SUD often occurs during major transitions in life; that substance use is one of several risk-taking behaviors and treatment should be approached utilizing a holistic perspective; and the likelihood of developing an SUD is positively correlated to the number of risk factors to which a person is exposed (Powell & Newgent, 2015).

This study recognized the 10 items of the JARR as representing the most prominent risk factors for juvenile substance use as found in the literature and that misinformation during the self-report process is common and is resultant of cognitive errors and/or situational factors (Brener, Billy and Grady, 2013).

Delimitations

Several delimitations existed within this study. Firstly, the inter-rater reliability estimates are delimited to CRCs recruited through convenience sampling. Secondly, the measurements of sex and ethnicity are delimited to participants between the ages of 12 and 19 who are receiving outpatient substance abuse counseling in a community mental health setting in Northwest Arkansas. Finally, data were collected between 2010 and 2015 by certified and licensed substance abuse counselors; therefore, the results rely solely on the counselors' level of integrity and skill at data collection.

Definitions of Key Terms

For the purposes of this study, the following key terms were identified as shown below.

Disability: For the purpose of this study, the author recognized and applied the term as defined by the Americans with Disabilities Act (1990), and with respect to the individual as possessing a physical or mental impairment that substantially limits one or more major life activities, has a record of such an impairment, or is regarded as having such an impairment (Americans with Disabilities Act, 1990).

Ethnicity: Since race has been disputed in the fields of anthropology and biology as a valid biological classification and possesses the cultural traits of ethnicity, including sharing common national origins and/or cultural traditions, for the purposes of this study the term "ethnicity" were applied to encompass both traditional terms of "race" and "ethnicity."

Illicit Drugs: For the purpose of this study, the author recognized and applied the term as defined by the World Health Organization (WHO) which referred to non-medical use of a variety of drugs prohibited by international law.

Juvenile: For the purpose of this study, the terms "juvenile," "adolescent," and "youth" were applied interchangeably in reference to a person who has not yet had his/her eighteenth birthday.

Sex: The American Psychological Association recognizes sex as "a person's biological status" and is "categorized as male, female, or intersex" while gender is regarded as "attitudes, feelings, and behaviors that a given culture associates with a person's biological sex" (APA, 2011, p. 1*)*. Since only the person's biological status will be taken into account in the collection of the data, for the purposes of this study, "sex," rather than "gender" will be applied as an identifier.

Substance Use Disorder (SUD): For the purpose of this study, the APA (2013) *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.) (DSM-5) criteria for a substance use disorder (SUD) were applied. The DSM-5 describes an SUD as "a cluster of cognitive, behavioral, and physiological symptoms indicating that the individual continues using the substance despite significant substance-related problems" (p. 483). SUDs are currently defined by severity of condition (mild, moderate, or severe), replacing the terms *abuse* and *substance dependence*.

Summary

Juvenile substance use, as evidenced by delays in emotional and physiological development, the slowing of cognitive processing and the increased likelihood of inappropriate behavior, continues to be a problem. Since SUDs can have a detrimental effect on both

employment outcomes and quality of life (Stevanovic et al., 2015), vocational rehabilitation professionals could benefit from the use of a user-friendly instrument that would accurately identify young clients at risk.

Most of the screening instruments used in the detection of an SUD base overall findings on self-reported data. Unfortunately, the accuracy of self-report data is not assured, thus affecting the internal validity of the applied assessment. The JARR (Powell & Newgent, 2015) was developed as a user-friendly instrument to help mediate errors inherent to other assessments' reliance on self-report data by analyzing information from collateral sources.

This study was established on the psychometrics of Powell and Newgent (2016) by investigating whether the JARR would be a reliable, valid, user-friendly screening tool in the vocational rehabilitation counseling setting. This was achieved by examining whether VR counselors could accurately identify adolescents as *low*, *moderate* or *high* risk for an SUD on the JARR. This study also analyzed additional data to assess for differences in regard to sex and ethnical category to determine whether the JARR is externally valid.

Chapter II: Literature Review

Screening instruments have long been an important tool of health care workers for the identification of people with substance use disorders (SUD) and are vital to subsequent treatment planning. Valid and reliable tools are essential when considering incomplete and/or inaccurate information could lead to ineffective and possibly harmful outcomes. The complexity of accurately assessing substance use risk among adolescents is apparent when considering the number of variables that must be considered when attempting to understand problems and devise solutions (CSAT, 1999b).

Although several screening instruments are available, most rely solely on self-reported information and are thus vulnerable to threats to internal validity. The Juvenile Addiction Risk Rating (JARR) is a screening tool that attempts to minimize this vulnerability by basing its findings on information obtained through collateral sources (e.g., court documents and teacher reports). A survey of the literature found few SUD assessment instruments exist that have been designed explicitly for vocational rehabilitation (VR) settings, but none specifically for adolescents in VR settings.

The purpose of this chapter is to provide an overview of the literature in relation to these topics. In an effort to adequately present the themes and motifs that emerged from this body of information that were consistent with the objectives of this study, this chapter is organized into the following four broad categories: 1) Substance Use among Adolescents; 2) Screening for Substance Use in Rehabilitation Settings; 3) Problems with Self-Report Screening Procedures; 4) and Development of the JARR. The first category will establish the need for identification of youths at risk for onset of SUD while the second will provide justification for juvenile risk assessment in VR settings. The third category presents problems with the most widely used

juvenile risk assessment instruments, and the fourth describes the development of the JARR as a solution to problems inherent in self-report instruments.

Substance Use among Adolescents

Adolescence can be a period of multifarious changes characterized by increased engagement in impulsive high risk behaviors and experimentation, often with alcohol and other drugs (Castellanos-Ryan, O'Leary-Barrett, & Conrod, 2013; Petersen, Crockett, Richards & Boxer, 1988). The prevalence of substance use among adolescents becomes abundantly clear when taking into account the findings of the 2013 National Survey on Drug Use and Health. According to the survey, an estimated 11.6% of 12- to 17-year-olds had used alcohol within the previous 30 days, while 8.8% of them had participated in illicit drug use (CSAT, 2014; SAMHSA, 2014b). Current data suggest that alcohol is the most prominent, with 66% of 12th grade students reporting current usage (Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2015). This was followed by 44.4% of high school seniors reporting using marijuana, 6.5% for inhalants, 6.3% for hallucinogenic substances, 5.6% for MDMA/ecstasy, 4.6% for cocaine, 1.9% for methamphetamines, and 1.0% for heroin (Johnston et al., 2015).

These findings are especially sobering when considering recent studies linking substance use disorders (SUDs) with poorer life outcomes, including reductions in school performance, deficits in mental and physical health, alienation of family and peers, financial distress, and lower levels of quality of life (Stevanovic et al., 2015). Hawkins, Catalano, and Miller (1992) observed how substance abuse interferes with personal motivation and basic cognitive processes while intensifying symptomology of mood disorders and elevating the risk of accidental injury and death. Substance use also has been shown to be a predictor of male promiscuity, often resulting in unprotected sexual behavior (Capaldi, Cosby, & Stoolmiller, 1996) and contributing

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to the number of unplanned pregnancies and sexually transmitted infections (Tapert, Aarons, Sedlar, & Brown, 2001). Moreover, Hawkins et al. (1992) correlated substance usage with an increased risk for acquired immunodeficiency syndrome (AIDS), child abuse, violent crimes, lost productivity, unemployment, and often results in the destruction of families, going as far as saying that substance usage actively contributes to the "weakening of the bonds that hold society together" (p. 64). Over 100 Americans die each day to drug overdoses, more than those who die from traffic accidents, gun violence, and falls (Center for Disease Control and Prevention, 2015).

Although the number of adolescents currently using alcohol, marijuana, and other illegal drugs has decreased over the last decade (Johnston et al., 2015), the number of juveniles currently using alcohol and other drugs continues to warrant considerable concern due in large part to the impact on emotional and physiological development, including slower cognitive processing and increases in violent and aggressive behavior (Ali et al., 2011; Jacobus et al., 2015), and the resulting impairments in social and vocational areas of life.

Among the harmful health effects associated with alcohol-specific substance use are cardiomyopathy, irregular heartbeat, high blood pressure, stroke, cirrhosis of the liver, pancreatitis, cancer, and a weakened immune system (National Institute on Alcohol Abuse and Alcoholism, 2015). Alcohol consumption also has been linked to the reduction of white matter quality in the brains of youths, resulting in impaired cognitive functioning and other clinical consequences (Bava, Jacobus, Thayer, & Tapert, (2013). This is more concerning considering observed alcohol dependence among juveniles nears that of adult levels during late adolescence and that although juveniles do not drink as often as adults, they match the consumption of adults when they do drink (Clark, 2004).

The degree to which alcohol consumption is ingrained in American culture becomes evident when compared to public shifts in acceptance of tobacco and illicit drug usage over the last half century. The general acceptance and usage of alcohol has remained, for the most part, static. Reflective of alcohol's role in common culture is the often expected over-consumption of the substance following entrance into college. This transition period from adolescence to young adulthood has been correlated with a profound increase in alcohol consumption, from 22.7% for 16 and 17-year-olds to 59.6% for 18 to 25-year-olds. White et al. (2006) found leaving home to attend college to be linked to increased risk for binge drinking (the consumption of five or more drinks for men, and four or more drinks for women, within a two hour period) that Wechsler, Dowdall, Maenner, Gledhill-Hoyt, and Lee (1998) called "the most serious public health problem confronting American colleges" (p. 57).

Even more disturbing is alcohol's link to violence on college campuses. Of the reported sexual assaults on college campuses, approximately 50% involved alcohol (Abbey, 2002). Wechsler and Nelson (2001) observed how at colleges with a culture of binge drinking, non-binging students were approximately 100% more likely to be assaulted, 150% more likely to have their property damaged, and 150% more likely to have their sleep disturbed by students using alcohol than peers on campuses without cultures of binge drinking. Although popular culture often views excessive use of alcohol as a rite of passage for transition into higher learning, Jackson, Sher, and Park (2005) noted that same-aged peers who did not pursue a post-secondary education also exhibit similar alcohol use; thus, it is evident that this is a phenomenon that extends beyond the college experience.

Cannabis is the most widely used illicit substance in the world (Radhakrishnan, Wilkinson, & D'Souza, 2014). In the United States, it is estimated that 7.4% of individuals 12 to

17-years-old are current users of the substance (SAMHSA, 2015b), with approximately 35% of high school seniors reporting use within the past year and just under 6% reporting using marijuana almost daily (Johnston et al., 2015). Among the immediate effects of cannabis use are an increased heart rate, increased blood pressure, psychomotor impairment, euphoria, paranoia, mild hallucinations, altered sense of time, decreased problem-solving ability, memory difficulty, and increased appetite (SAMHSA, 2015b). Long-term smokers of cannabis have been shown to report sick from work more often than the general population, and have an increased risk for respiratory infections such as chronic bronchitis (National Institute on Drug Abuse, 2015). Other possible consequences associated with long-term use of cannabis include unemployment and lower relationship and life satisfaction that could last beyond adolescence and manifest throughout the lifespan (Fergusson & Boden, 2008). Jacobus et al. (2015) observed that early onset and repeated use of marijuana resulted in poorer reasoning ability and that decreased neurocognitive functioning became evident by the emergence of young adulthood. Furthermore, Volkow, Baler, Compton, and Weiss (2014) found regular use of marijuana during adolescence is associated with less neural conductivity in the brains of adults.

Although discussion continues regarding marijuana's role in the onset of psychosis and other mental health conditions, studies point to convincing evidence supporting the link of cannabis use in adolescence with an increased risk for the development of psychotic disorders, especially for individuals who are vulnerable due to a personal or family history of psychotic symptomology including schizophrenia (Degenhardt & Hall, 2006; Radhakrishnan, et al., 2014).

Though long debated, recent research supports the assumption that prolonged use of cannabis can lead to addiction to the substance (Hall, 2015) with an estimated nine percent of users attaining dependency (NIDA, 2015). Volkow et al. (2014) noted how "epidemiologic and

preclinical data suggest that the use of marijuana in adolescence could influence multiple addictive behaviors in adulthood" (p. 2220), thus supporting the hypothesis that cannabis may serve as a gateway drug to other, perhaps more dangerous, substances. However there still exists considerable debate whether marijuana serves as an impetus to other illicit drugs. Much of the evidence supporting the gateway theory is based on observations that marijuana use often precedes that of other illicit drugs, and that early and frequent use of marijuana is correlated with increased likelihood of other illicit drug use (Kandel, 2002). Though these observations strongly support a correlation between cannabis use and eventual use of other illicit drugs, Hall and Lynskey (2005) argued that marijuana usage as causation is far from certain, citing pre-existing genetic conditions, illicit drug-using peers, and cultural tolerance toward substance use as likely factors contributing to the transition from marijuana to other illicit drugs. That is, the gateway theory that marijuana use encourages the transition to other illicit drug use does not account for the possibility that common characteristics of people who use illicit substances may contribute to the pattern. Animal studies continue to investigate whether cannabis serves to make organisms more susceptible to other more potent substances (e.g., opioids). Interestingly, recent animal studies have suggested a multigenerational effect noting that rats, whose parents were given cannabis as adolescents, were more likely to be susceptible to opioid addiction (Webb, 2015).

In addition to alcohol and cannabis, there are a host of other illicit substances used by juveniles to induce highs. SAMHSA (2015c) cited three of the most commonly misused or abused drugs, excluding alcohol, cannabis, and tobacco, as consisting of opioid pain relievers (e.g., morphine, methadone, buprenorphine, heroin, hydrocodone, and oxycodone), psychiatric medication (e.g., benzodiazepines and antidepressants), and over-the counter medications (e.g., dextromethorphan, bitter orange, dimenhydrinate, diphenhydramine, and pseudoephedrine). The

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National Institute on Drug Abuse (2014) noted that younger adolescents are more likely to use inhalants (e.g., cleaning fluids, glues, lighter fluid, and aerosol sprays) while their older peers tend to prefer synthetic marijuana (e.g., K2/Spice) and prescription medication (e.g., Vicodin® and Adderall®). Additionally, Storra, Westergaard, and Anthony (2005) observed that adolescents who used inhalants before the age of 14 tended to be more likely to use opioids by the emergence of young adulthood. This is more alarming when considering the profound increase and subsequent deaths resulting from misuse of heroin, an opioid. From 2002 – 2013 deaths as a result of heroin overdose increased from .7 to 2.7 per 100,000, with a spike from an average 6% increase per year between the years 2000 and 2010, to 37% per year between 2010 and 2013 (Hedegaard, Chen, & Warner, 2015).

A number of variables may contribute to an adolescent developing an SUD. These include the predisposed factors of temperament, genetic predisposition, neurobehavioral disinhibition, social competencies, dysfunctional parenting, experiencing abuse/neglect, and peer behaviors (Feldstein & Miller, 2006; Palmer et al., 2009). A review of the literature led Powell and Newgent (2016) to list prior SUD services, mental health problems, family history of SUD, quality of family relationships, choice of friends, school problems, history of aggression, history of juvenile delinquency, attitude toward substance use, and the degree of substance use as factors to consider in the assessment of risk for the development of an SUD.

Since the presence of SUDs has been linked with juvenile delinquency, youth violence, and poorer quality of life outcomes, a need for early detection of substance use risk becomes apparent. Teplin et al. (2005) noted the correlation between misbehavior and substance use and argued for the need for comprehensive substance abuse treatment planning for juveniles who presented with delinquency. Feldstein and Miller (2006) supported this stance and called for

youths presenting with SUDs to be assessed for other problematic behaviors. Considering this, the necessity for accurate assessment of substance use risk is obvious as early intervention is necessary for successful treatment planning.

Screening for Substance Use in Rehabilitation Settings

      Rehabilitation Field Distinction. According to the U.S. Department of Labor, rehabilitation counselors work to help people with disabilities gain independence by providing services to help accommodate for the effects of disability (2015). The field of rehabilitation is exceptionally broad and includes a wide range of occupational positions in a variety of settings including public and private entities such as hospitals, nursing homes, schools, group homes, and universities. For the purposes of this study *rehabilitation* refers specifically to the field of *vocational rehabilitation* which seeks to improve quality of life for people with disabilities through successful placement in gainful employment. That is VR counselors view successful job placement as an avenue to independence and attempt to eliminate barriers to work through an orchestration of support service interventions including the identification and development of a marketable skillset, teaching interviewing skills, providing psycho-educational opportunities, the implementation of restorative services, and other specialized interventions. This approach differs significantly from mental health and substance abuse counselors who focus on helping individuals develop and implement strategies to cope with the symptoms of psychiatric disorders (United States Department of Labor (DOL), 2015), and provide support and treatment for people experiencing SUD (DOL, 2015) respectively. The approaches are not mutually exclusive as each may apply elements of the others in the service of clients.

      SUD and VR. As of December 2015, only 19.2% of people with disabilities had jobs while 68.1% of people without disabilities were employed (DOL, 2015). This employment

discrepancy continues to exist in spite of whether people with disabilities have earned graduate or professional degrees (Hollar, 2008). This juxtaposition is indicative of the degree of difficulty VR counselors experience while attempting to help their clients find inclusion in the world of work.

In addition to environmental factors such as transportation and architectural barriers, discrimination based on inaccurate beliefs continues to manifest. It is not uncommon for employers to consider the hiring of people with significant disabilities as a risky endeavor, presuming insurance rates would dramatically increase or that the business would be required to provide expensive accommodations that would create an undue financial hardship on the entity. Others consider the Americans with Disabilities Act as encouraging the hiring of individuals based on disability rather than on their ability to do the job, and that of the ADA as preventing businesses from terminating people who have disabilities, even though they are not suited for the positions. Perhaps the greatest barriers to employment faced by people with disabilities are attitudes of employers and the public that manifest into the stigmatizing and stereotyping of individuals (Centers for Disease Control and Prevention (CDC), 2015).

In spite of substance use having a detrimental effect on the physical and mental well-being, behavior, and social competence of people with disabilities (Barret & Paschos, 2006), there exists a substantial amount of evidence suggesting that people with disabilities tend to experience a higher prevalence of substance abuse than does the general population (Koch & Koch, 2014). When considering the barriers alcohol and other drugs place on the finding, obtaining, and maintaining of gainful employment, it is unfortunate that people with disabilities are estimated to be 2 to 4 times more likely to develop an SUD than people without disabilities (Kim & Kaye, 2015). Glazier and Kling (2013) noted that, for most illicit substances,

approximately 40% of people with disabilities engage in substance abuse compared to approximately 34% of people without disabilities. Among the factors contributing to the increased likelihood of people with disabilities developing an SUD are isolation/non-inclusiveness, pain management, unsuccessful or incomplete rehabilitation services, and individual coping strategies toward stigma (Koch & Koch, 2014). This is troubling because the co-occurrence of a disability and an SUD may contribute to poorer rehabilitation service outcomes, adverse reactions to medications, the reinforcement of isolation and marginalization, and unemployment (Hollar, 2008). It is estimated that 10 – 14% of people living with a disability concurrently experience an SUD (Hollar, 2008). The factor of an SUD diagnosis alone contributes to several negative outcomes in the world of work including increased instances of absenteeism, accidents, worker's compensation claims, and costs to the employer (Glenn & Keferl, 2008). When an SUD is combined with another form of disability, barriers to employment become even more profound.

With regard to mental health, individuals with psychiatric disorders are more likely to develop SUDs, and people with SUDs are more likely to develop psychiatric disorders. According to the National Survey of Substance Abuse Treatment Services, about 45% of Americans seeking substance use disorder treatment have been diagnosed as having a co-occurring psychiatric disorder and SUD (SAMHSA, 2015a). This prevalence is more unsettling when considering approximately 47% of women with disabilities and co-occurring SUDs are estimated to experience physical and sexual abuse, while approximately 20% of men with disabilities and co-occurring SUDs experience physical and sexual abuse (SAMHSA, 2011). In a study of women with diagnoses of bulimia nervosa, Lilenfeld et al. (1997) found that those

with co-occurring SUDs were more likely to have been diagnosed with conduct disorder or oppositional defiant disorder, make rash behavioral decisions, and attempt suicide.

Unfortunately, co-occurrence of psychiatric and substance use disorders is not uncommon. Data show that 3.6% of all adults living in the U.S. have experienced both a psychiatric disorder and a substance use disorder within their lifetimes (CSAT, 2012). Furthermore, an estimated 26.7% of adults who had a DSM-IV diagnosable disorder had partaken of illicit drugs, compared to 13.2% of adults who did not have a DSM-IV diagnosable disorder (CSAT, 2012). Blum, Kelly, and Ireland (2001) noted that students with disabilities, as a probable result of marginalization, cited higher levels of psychosocial distress including a higher number of risk factors, and fewer protective factors, that may contribute to lower levels of school satisfaction, more absenteeism, and an increased likelihood to drink alcohol and smoke tobacco.

When comparing the varying types of impairment, people with spinal cord injuries, traumatic brain injuries, and psychological disorders tend to present with higher rates of SUD (NAADD, 2013). It has also been observed that people who acquire their disabling condition post-childhood are more likely to develop SUDs than people who have lived with a disabling condition their whole lives (O'Sullivan, Blum, Watts, & Bates, 2015).

Risk factors for SUD among people with disabilities include: 1) difficulty accepting disability, 2) circumstances of onset of disability, 3) the presence of chronic pain, 4) recurring medical problems related to the disability, 5) isolation of the individual, 6) difficulty maintaining attention, 7) the availability of prescription medications, 8) a sense of societal entitlement to use illicit substances, 9) pervasive poverty, 10) the management of mental health issues, 11) inappropriate drug education, and 12) high unemployment (McAweeney, Jones, Moore, 2008).

Policy. Although the DSM-5 recognizes SUD as a psychiatric disorder comprised of a "cluster of cognitive, behavioral, and physiological symptoms" (APA, 2013), approximately half of the state-sponsored vocational rehabilitation agencies in America currently employ sobriety models mandating a waiting period for the individual to demonstrate abstinence prior to eligibility, or a pausing or cessation of services until the terms of sobriety are met (Moore, McAweeney, Keferl, Glenn, & Ford, 2008). An example of this approach can be found in Arkansas as evidenced in Appendix F of the *Arkansas Rehabilitation Services* (ARS)*Policy and Procedure Manual*, that mandates "disciplinary action" to ARS customers who refuse to submit to "a drug test, alcohol test or reasonable-suspicion testing," (Arkansas Department of Career Education, 2014, p. F-1). Possible disciplinary action includes a behavioral contract stipulating complete abstinence as a condition for continued services, referrals for substance abuse treatment (not at the expense of the agency), and suspension or termination of services until abstinence is maintained (ACE, 2014). Similar phrasings are used in the current *Arkansas Rehabilitation Services Client Handbook* and include the following paragraph:

ARS has the responsibility to ensure that persons receiving services can succeed at going to work. If at any time during the rehabilitation process, the counselor has just cause to suspect that the client is abusing controlled substances (to include alcohol), he/she may elect to interrupt services and/or have the client undergo drug screening. Services will not be continued until such time as the client is free of any substance abuse problem and is able to resume participation in the agreed rehabilitation program. (p. 6)

Considering the ARS policy to SUD in the VR process it is not surprising that Moore, McAweeney, Keferl, Glenn, and Ford (2008) found Arkansas Rehabilitation Services to have reported the lowest percentage (0.90%) of SUD as a primary or secondary diagnosis among

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people seeking VR services. The state with the highest percentage of clients with an SUD as a primary or secondary diagnosis was South Carolina with 28.32%, and the mean of the public VR agencies of all fifty was 10.62% (Moore, McAweeney, Keferl, Glenn, & Ford, 2008). This broad range between the two states might be better understood when considering South Carolina Vocational Rehabilitation Department recognizes and accepts SUD as primary and secondary diagnosis and includes specifically designed SUD treatment protocols that may include intensive residential treatment and other interventions to help VR clients be more successful in finding, obtaining, and maintaining employment. South Carolina's reported percentage of VR clients with SUD was much closer to the estimate of 22% 12-month SUD diagnosis rate for current VR clients (Heinemann, Lazowski, Moore, Miller, & McAweeney, 2008). A diagnosis of SUD in Arkansas could lead to disqualification for VR services altogether.

In spite of the fact that a growing body of literature suggests a quarter of all VR consumers have an active SUD at the time of application for services (Moore & Keferl, 2008), there remain few consistent policies and practices that have been widely applied throughout the state-federal VR system. One exception to this is the federally funded Department of Veterans Affairs (VA) Veterans Health Administration (VHA) that provides VR services to individuals with a primary diagnosis of SUD, and view employment as not only the desired outcome, but as a vital component of treatment as well (Kerrigan, Kaough, Wilson, Wilson, & Bostick, 2004). VR success rates of 55% for people with SUD receiving VR services, with sustained cost/benefit ratios of $7.00 saved for $1.00 spent (McAweeney, Keferl, et al., 2008), counter arguments identifying the fiscal investment of serving people with SUD as irresponsible and wasteful.

Although the presence of an SUD is not uncommon among VR consumers, and may profoundly disrupt the outcome goals of treatment, many state/federal VR programs lack

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standard SUD protocols, and often do not screen for SUD risk among applicants altogether (Moore, McAweeney, et al, 2008). This is concerning when considering effective individualized employment plans (IEPs) are based on accurate assessments of individuals' needs, and can be adversely affected with symptoms of SUDs. Often as a result of not identifying SUD risk factors at the beginning of the process, time is wasted as symptoms become apparent later in treatment (e.g., tardiness and absenteeism) resulting in not only failed placement and substantial revisions to the IEPs (Glenn & Keferl, 2008) but time and government money as well.

Treatment. Proponents of SUD treatment as part of the VR process argue that the exclusion of SUD treatment is counterintuitive given that unemployment is a factor that may reinforce, or contribute to the development of an SUD, thus helping those who are identified and denied VR services to be more at risk for continued use, unemployment, and other unhealthy outcomes.

McAweeney, Keferl, Moore, and Wagner (2008) advocated for VR service delivery to be more SUD-specific and to include counseling to explore supports and barriers, follow-up services to increase likelihood of tenure, an analysis of clients' transportation needs, and supported employment interventions. They went on to list the following services as being correlated with the achievement of gainful employment: Counseling, accurate diagnosis and treatment, job search, placement, and on-the-job supports (McAweeney, Keferl, Moore, & Wagner, 2008). Moreover West (2008) pointed out how the utilization of vocational rehabilitation services as part of treatment for SUD had been shown to be effective in helping individuals obtain and maintain sobriety.

The exclusion of SUD treatment from VR services is difficult to rationalize when considering people with disabilities are more vulnerable than the general population, with an

estimated 23 million people with disabilities experiencing SUDs (SAMHSA, 2011).

Furthermore, identification of SUD early in the VR process, followed by the appropriate

provision of services to minimize the barriers to employment has been correlated with an

increased likelihood of successful placement and shorter time spent on VR services than those

without an SUD (Heinemann et al., 2014). When considering this, it becomes evident that the

evaluation phase is an important element of treatment planning in the vocational rehabilitation

process, as later phases are inherently dependent on accurate assessment (Rubin & Roessler,

2001). For VR programs that recognize SUD as a valid psychiatric disability deserving of

service provision, accurate assessment is vital to the determination of eligibility for services and

the development of effective individualized employment plans (IEPs), since early identification

and the ability to target individual needs and treatment interventions can hasten improvement of

quality of life issues (SAMHSA, 2012). Thus, Winters and Kaminer (2008) suggest VR services

begin with screening for substance use and related issues as part of the intake procedure,

followed by an assessment of severity if a problem becomes apparent.

McAweeney, Keferl, Moore, and Wagner (2008) cited predictors for successful job

placement found in VR closure studies of people with SUD and a co-occurring disability as

being comprised of a combination of factors. These included not having a cognitive disability,

two or more work disincentives (Being financially independent of family and friend support and

not being financially reliant on Medicaid); and five VR variables (Less time receiving VR

services, higher costs of services, receiving more services, receiving diagnosis and treatment, and

receiving job placement services including supported employment interventions). These findings

were consistent with other VR closure studies including persons with a wide diversity of

disabilities (McAweeney, Keferl, Moore, & Wagner, 2008).

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Supported employment has been demonstrated to be an especially important component of successful job placement and treatment for people with SUD and other disabilities (Hollar, 2008). Interestingly it emerged as an alternative to the medically based train-place model which espoused the training of individuals to cope with a variety of psychiatric symptoms prior to placement in an employment setting. In contrast, supported employment incorporates a social work perspective which requires the client to experience real-life challenges and benefits (Corrigan & McCracken, 2005). In this case supported employment includes directly placing the client in competitive employment with the ongoing supports needed to help ensure job tenure (McAweeney, Jones, & Moore, 2008).

Interestingly, Juhnke, Vacc, Curtis, Coll and Paredes (2003) found professionals serving individuals with SUDs were reluctant to incorporate standardized instruments into the assessment process. Cardoso, Pruett, Chan and Tansey (2006) hypothesized several possible reasons for this phenomenon, including a perception of an ability to diagnose without the use of a formal instrument, as well as a perceived lack of training in the administration of formal instruments.

The skillsets and perceptions of VR counselors vary considerably with regard to serving people with SUDs. Interestingly VR counselors tend to perceive themselves as being less effective when serving people with SUDs than with other populations. Glenn and Keferl (2008) observed VR counselors' concerns of a lack of SUD specific training in rehabilitation coursework as a possible reason for this perception. Heinemann, McAweeney, et al. (2008) identified lack of field experience with SUD, inadequate formal SUD-specific education, a scarcity of standardized procedures, a shortage of SUD-specific policies, and consumers deliberately concealing the condition as other possible contributing factors, and Moore,

McAweeney, et al. (2008) identified concerns of relapse, non-compliance with treatment, and the potential of failed drug screens as contributing to the perception. They went on to assert that this perception could negatively influence VR counselors' effectiveness when serving this population (Moore, McAweeney, et al., 2008). Rodgers-Bonaccorsy (2010) observed that VR counselor perceptions of inadequacy may be countered through SUD training combined with training addressing VR counselor role adequacy, self-esteem, support, and legitimacy.

Juveniles in VR programs. One of the most important and difficult developmental stages in the lives of people in the United States is the shift from adolescent high school student to that of young adult in the world of work. This is especially true for people with disabilities who might require a complex orchestration of services no longer mandated upon graduation from high school. Rubin and Roessler (2001) described school to work transition as being "an outcome-oriented process that promotes movement from school to postschool activities, including postsecondary education, vocational training, integrated employment…continuing and adult education, adult services, independent living, and community participation" (p. 368).

The Individuals with Disabilities Education Act (IDEA) of 2004 cites three specific ages in which specific transition planning actions are to occur: age 14 (younger when appropriate), age 16 (younger when appropriate), and 1 year before reaching the age of majority (18 in most states). It requires that an individualized education program (IEP) team carefully examine the transition service needs for individual students and be comprised of a measurable results-oriented, strengths-based approach that is individualized to each person's needs. It must include relevant obtainable goals with objectives such as comprehensive vocational assessments, additional vocational training (e.g., college, vocational/technical school), additional activities of

daily living (ADL) training, supported employment, and other necessary services to assist the person with successful transition (Yell, Shriner, & Katsiyannis, 2006).

In addition to the client, the transition team may consist of a variety of service providers including parents, school faculty and counselors, social workers, case managers, employers, VR counselors, and others. Recognizing the profound barriers SUDs might have for adolescents, the identification of at-risk individuals prior to leaving high school and entering the job market is crucial to their success as adults. Once identified, the team may suggest and organize an array of interventions to help the individual successfully navigate the transition period.

By the age of 14 transition service needs, including secondary education goals, must be included in the IEP. Within the document all relevant supports (e.g., extracurricular activities, behavior intervention plans, assistive technology, and communication needs) must also be addressed. By 16 the IEP team, in addition to reviewing and continuing implementation of the planning established at 14, must develop a statement of needed transition services, postschool goals and supports needed to meet those goals, and outline these in a transition plan. Finally one year before the age of majority, plans for the future of the individual's educational rights are developed. Families are responsible for identifying whether their children are capable of making informed decisions regarding employment, finances, and other tasks of daily living, and if not how power of attorney might be designated.

It is not difficult to imagine how an SUD might disrupt clients' abilities to effectively work toward transitional goals. In 2011, most substance abuse treatment admissions aged 18 to 30 with known age of initiation (74.0%) reported initiating substance use at 17 years old and younger, with 10.2% reporting having initiated substance use by the age of 11 and younger (SAMHSA, 2014c). The same study reported more than three quarters (78.1 percent) of those

who had experimented with substances by the age of 11 were using 2 or more substances at the time of admission into treatment (SAMHSA, 2014c). Thus IEP teams should be aware that effective screening for substance use risk among juveniles with IEPs could assist in the identification of potential barriers to successful transition. This is evident when considering the resources available to treat the condition prior to the age of majority are considerably more plentiful when compared to the paucity of treatment funding sources following graduation.

Since so much is in the balance relative to the VR counselor's decisions, and because it has been widely recognized that "past behavior is the best predictor of future behavior" (Miller, 1995, p. 49), it seems clear that utilization of a user-friendly and efficient instrument to either confirm or dispute any initial diagnostic impressions would serve to improve the accuracy of VR counselors' treatment decisions. VR counselors, social workers, case managers, juvenile probation officers and others attempting to help at-risk youth with disabilities navigate through adolescence and transition into adulthood and the world of work would better serve their clients with instruments that accurately identify adolescents who are at risk for substance abuse (Nation et al., 2003). This assumption paired with known effects of alcohol and other drugs on school and work performance, underscores the urgency for VR counselors to accurately identify clients who may need specialized interventions to help ensure vocational success. Unfortunately, according to established procedures in many state vocational rehabilitation agencies, to admit to having an SUD could result in not meeting eligibility requirements or even loss of services.

An instrument that consistently and accurately identifies juveniles who are at risk of developing an SUD would be a valuable tool for the vocational rehabilitation counselor involved in the development and enacting of individualized employment plans (IEPs) to help clients successfully transition into the world of work. However, a review of the literature revealed few

adult SUD screening instruments designed specifically for VR settings and none designed

specifically for juveniles seeking VR services. DiNitto and Schwab (1993) applied the

Addiction Severity Index (ASI; McLellan et al., 1992) and the Substance Abuse Subtle

Screening Inventory (SASSI; Miller, 2003) in VR settings and found both were more effective

than the standardized intake interview alone for the identification of individuals at risk of SUD.

This is not surprising, given that VR counselors often avoid exploring questions about substance

use factors (Heinemann et al., 2014; Moore & Li, 1998).

One instrument that has been validated for the VR setting is the Substance Abuse in

Vocational Rehabilitation Screener (SAVR-S; Heinemann, Moore, Lazowski, Miller, &

McAweeney, 2007). Developed as part of a project funded by the National Institute on

Disability and Rehabilitation Research (NIDRR), it is a 43-item instrument derived from the

SASSI-3 which previously had been used successfully to assess for substance use among people

with disabilities (Guthmann & Moore, 2007). A 28-item American Sign Language version of the

substance abuse screener has been validated for use with people with hearing impairments. Like

the SASSI-3, the SAVR-S relies on self-reported information to base its findings (Guthmann &

Moore, 2007).

Without these and similar instruments, VR counselors tend to base treatment decisions on

less empirical grounds such as unsubstantiated beliefs and feelings; furthermore without

standardized approaches to SUD risk assessment, VR counselors tend to develop their own less

reliable methods (Glenn & Keferl, 2008).

Diversity and assessment. A multicultural perspective is important when working with

consumers of varying ethnic backgrounds to maintain assessment equivalency. This is especially

important when assessing for SUD. A multicultural approach recognizes that behavior is best

understood in the context of social interaction. Family lives and clients' roles within their communities should be considered when assessing how SUD might be affecting clients' functionality, as well as how the community perceives the behavior. The community's typical ways of resolving SUD problems should then be respected throughout the treatment process (Blume, Morera, De La Cruz, 2005).

Blume, Morera, and De La Cruz (2005) noted that some ethic-minority communities may still manifest distrust toward the assessment process in part due to a history of unethical practices by human service institutions citing the U.S. Public Health Service Syphilis Study at Tuskegee as an example. People belonging to ethnic-minorities often receive less mental health treatment access than those of the majority, and various theories have emerged as to why this occurs. This may be due to a lack of knowledge regarding mental health treatment services, spiritual and cultural interpretations of psychiatric disorders, perceived stigma, and culturally favorable coping strategies, some researchers point to a racial bias among healthcare professionals as the primary cause of the problem (Snowden, 2003). Research has also revealed that mental health practitioners and administrators, when other sociodemographic factors such as income have been removed, inaccurately assess ethnic-minorities based on racial expectations (Snowden, 2003).

Sex is another factor that should be taken into account when assessing SUD risk. With all things being equal, the outcomes of substance usage between males and females can be considerably different. For example, women's stomachs tend to be less acidic than men's therefore women are typically more susceptible to intoxication at lower levels of consumption than men. Furthermore, since women have more body fat than men, substances tend to remain longer in their systems resulting in less quantity of substances needed to achieve the same level of intoxication as men.

Problems with Self-Report Data.

Conducting a review of a client's case history is highly important in that it provides the service professional with a longitudinal perspective of the client's exposure to both risk and supportive factors (Manzoni, Vermunt, Luijkx, & Muffles, 2010). The most prevalent means of gathering data for diagnosis and service planning for adolescent consumers is by self-report questionnaires and verbal self-reporting (Hoskin, 2012; Del Boca & Noll, 2000). Reasons for this practice include demonstrated brevity, cost effectiveness, reliability and validity. The resulting data from these assessments could, among other things, be used to track and monitor behavioral trends, influence policy changes, and modify treatment programs (Brener et al., 2003). Unfortunately, assessment instruments that primarily rely on self-reported data are subject to challenges to internal validity (Del Boca & Noll, 2000). Problems range from genuine errors in client recollection to the intentional submission of inaccurate information to disrupt the collector's efforts (Fan et al., 2006; Roediger & DeSoto, 2015). Even with the intention to fully disclose past experiences, a number of variables may contribute to distortion including the tendency to place blame for failure on external factors and success on internal factors, as well as the effect of substances on individuals' internal states/emotions (Donovan, 2005). Stinchfield (1997) compared intake self-reported information of adolescents to post-treatment self-reported information and concluded that youths with SUD often minimized the degree of their actual use. Winters, Latimer, and Stinchfield (2001) cited this as a possible test effect that dampens the degree of data supplied at the beginning (intake) phase of the treatment process, but noted it was not significant enough to discount the validity of self-report instruments.

Inaccurate self-reports might not only be purposeful distortions, but might be the result poor insight, inattentiveness, misunderstanding of a prompt or question, and immaturity.

Unfortunately little research exists regarding the motivating factors and prominence of self-report inaccuracies within adolescent assessment measurements. Stinchfield (1997) compared intake self-reported information of adolescents to post-treatment self-reported information and concluded that youths with SUD often minimized the degree of their actual use. Winters, Latimer, and Stinchfield (2001) cited this as a possible test effect that dampens the degree of data supplied at the beginning (intake) phase of the treatment process, but noted it was not significant enough to discount the validity of self-report instruments.

Shiffman, et al., (1997) studied the retrospective self-reports of people trying to quit smoking and experiencing relapses, and noticed that in spite of expressed confidence in their ability to do so, had considerable difficulty accurately answering inquiries regarding affect, behavior, triggers, and dates related to the relapse, three months following the episode. It is therefore not unreasonable to infer that substances with more psychoactive properties than nicotine may contribute to memory recollection difficulties.

Even with the best intention to fully disclose past experiences, a number of variables may contribute to distortion. These might include the tendency to place blame for failure on external factors and success on internal factors, the effect of substances on individuals' internal states/emotions (i.e., inaccurately blaming others or self for relapse). Furthermore, life experiences following substance usage might also distort recollection accuracy. < Donovan text p.10>

Brener et al. (2003) identified two theories to explain threats to self-report validity. The first is representative of a cognitive theoretical perspective while the second is representative of a situational theoretical perspective. From a cognitive point of view, faulty data result from faulty mental health processes, such as recollection difficulties (Brener et al., 2003). This perspective

is supported by a body of research demonstrating how the brain does not fully encode past experiences and is therefore unable to fully decode information at the time of recollection; instead, the brain tends to reconstruct versions of the past that might be incompatible with actual events (Stone & Shiffman, 2002). Thus, individuals may present with inaccurate data with the full intention of truthful disclosure.

From the situational theoretical perspective, inaccuracies result from the social desires of the client, and/or the conditions at the time of the assessment (Brener et al., 2003). For example, Schlossberger, Turner, and Irwin (1992) observed an exaggeration of pubertal maturation during early adolescence and an understatement of pubertal maturation during late adolescence and attributed the occurrence to perceived gain within the statements. That is, when the youth thought it was beneficial to be seen as sexually mature, exaggeration occurred and when there was no perceived benefit, responses were underestimated. From this perspective, malingering may occur, exaggerating symptomology for psychological gain. In the same way, adolescents may underreport SUD symptomology to avoid treatment interventions and/or involuntary incarceration, maintain relationships, continue employment, etc. Furthermore, Krumpal (2013) observed that participants tend to provide inaccurate information based on a social desirability bias when addressing taboo subjects (e.g., sexuality and substance use).

The intentional submission of misinformation appearing to have no obvious social gain is a phenomenon observed by Fan et al. (2006), and results in a *jokester* effect that would most likely not significantly affect most large *N* studies, but could be more influential in small studies. Possible counters to these and other factors affecting self-report validity have long been investigated, and have prompted improvements in screening procedures (Richter & Johnson,

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2001; Winters, 2004). Even so, all instruments that rely on the accuracy of self-report data remain vulnerable to internal validity problems.

Juvenile Addiction Risk Rating Scale

Recognizing the need for a simple instrument as free as possible from the inherent problems that arise from self-report measures, Powell and Newgent (2016) developed the Juvenile Addiction Risk Rating (JARR). Powell (2015) argued that due to the JARR's reliance on collateral data (i.e., court, medical, and school records) rather than on the self-reports of adolescents and their parents, the instrument could serve to improve the accuracy of substance use risk assessments by complementing established self-report-based instruments.

The JARR is a two page instrument consisting of a 10-item Likert-type format (see Appendix A), with each item assigned a numerical score ranging from 0 to 3. The instrument is scored by adding together the assigned numbers from the items, and comparing the sum to the JARR's risk rating matrix. A score ranging from 0 – 8 indicates low risk, while 9 – 18 and 19 – 30 indicate moderate and high risk, respectively.

While developing the item pool, Powell and Newgent (2016) recognized that a variety of factors tend to increase the likelihood of a juvenile developing an SUD. A survey of the literature resulted in the identification of ten prominent risk factors: 1) History of Substance Abuse Services; 2) Mental Health History; 3) Family History of Addiction; 4) Strength of Family Relationships; 5) Peer Selection; 6) School-Related Difficulties; 7) Aggression and Violence; 8) Juvenile Delinquency; 9) Attitude toward Substance Use; and 10) Extent of Substance Use.

After determining, based on a content analysis, which 10 risk factors were most relevant to screening for substance risk, Powell and Newgent (2016) determined face validity by recruiting eight professionals specializing in counseling addiction and measurement from

institutes of higher learning who were given the opportunity to review the JARR and make recommendations prior to standardization.

To establish the JARR's reliability, Powell and Newgent (2016) used JARR ratings from 26 professionals (females = 17; males = 9) with varying levels of experience serving adolescents with SUDs. All were recruited from a single agency located in Northwest Arkansas. Each of the participants was given three vignettes depicting cases of youths with *low*, *medium*, or *high* risk for the development of an SUD (see Appendices B, C, and D), and were asked to complete a JARR for each of the cases. To demonstrate *ease-of-use*, none of the participants received instruction in how to complete, interpret, or score the JARR.

The psychometric findings of Powell and Newgent (2016) during the development of the JARR indicated strong support for the instrument's use as a supplement to assessments for adolescent risk factors that base scores primarily on client and parent/guardian self-report data. These findings are supportive of the assumption that the JARR measures what its authors purport that it does.

The authors found that all of the participants ($N = 26$) accurately rated each of the case studies depicted in the vignettes, suggesting that the vignettes were distinct from one another. As previously indicated, the JARR's total scores range from 0 to 30. Vignette 1 reflected a moderate risk level ($M = 15.77$, $SD = 0.99$, range = 14-18), while vignette 2 suggested a high risk level ($M = 22.69$, $SD = 1.16$, range = 20-24), and vignette 3 was representative of a low risk level ($M = 5.00$, $SD = 0.75$, range = 4-6). Vignette distinctiveness was supported with correlational analyses indicating that negative relationships between the vignettes were present. Cronbach's coefficient alpha indicated that no significant positive relationships (-.45) were present between the vignettes.

Powell and Newgent (2016) determined construct/criterion validity for the JARR by comparing its addiction risk to similar risk factors as measured by the 10 subscales on the SASSI-A2 by examining whether low/high risk adolescents significantly relate to low/high probability of an abuse or dependence diagnosis as determined by the SASSI-A2 and finally whether high risk individuals also report high levels of distress as measured by Y-OQ 2.01 (Wells, Burlingame, & Lambert, 1996). These comparisons were analyzed by using 313 juvenile case histories spanning the previous three years, and were representative of adolescents who had been referred (adjudicated) by the courts (78.27%), those in custody of the Arkansas Division of Youth Services currently residing in a co-occurring treatment facility (12.78%), youth enrolled in an intensive outpatient drug program (4.79%) or who had been parent referred (4.15%).

Of the 313 adolescents, 66 were female and 247 were male, with ages ranging from 12 to 19 years (M = 15.83, SD = 1.25) and consisted of White/Caucasian (58.15%), Hispanic (25.56%) Black/African American (9.9%), Native American (3.51%), Asian-American (1.29%), and other individuals (1.6%) from various ethnicities (Powell & Newgent, 2016). Grade levels of the youths ranged from 7th to 12th, with 58.15% of the individuals representing students from traditional schools, 20.45% from alternative schools, 7.99% who were expelled, 6.39% who had obtained a GED, 2.24% who had dropped out of school, with the rest having been home-schooled or that were in special education programs. The case reviews and JARR scoring had been conducted by certified and licensed substance abuse counselors and support staff employed by the same.

Correlational analyses (T-scores) found a number of significant relationships between the 10 items of the JARR (Powell & Newgent, 2016) and the 10 subscales on the SASSI-A2 (Miller, 1997); additionally, differences were found between the SASSI-A2 severity of diagnosis and the

JARR level of risk. The investigators employed a chi-square analysis, determining that a higher risk rating on the JARR resulted in a more serious diagnosis on the SASSI-A2 (χ^2(6, N = 312) = 150.04, $p < .0001$). Thus, a low JARR risk rating relates to a low probability rating on the SASSI-A2, a moderate risk rating relates to high probability of abuse rating on the SASSI-A2, and a high JARR risk rating relates to a high probability of dependence rating on the SASSI-A2.

When comparing the JARR (Powell & Newgent, 2016) scores with the total distress score as measured by the Y-OQ 2.01 (Wells et al., 1996), correlational analyses again revealed significant relationships. Specifically, Tukey's HSD test indicated a positive correlation as juveniles with a high JARR risk rating scored significantly higher on total distress than did those with moderate or low risk levels *(p < .05)*. Furthermore, individuals with a moderate risk rating scored significantly higher than those with a low JARR risk rating *(p < .05)* (Powell & Newgent, 2016).

Finally, in an analysis using independent-samples *t* tests of sex differences of JARR total scores (66 females and 247 males), Powell and Newgent (2016) found no significant differences between sex types, *t*(87.93) = 1.18; *p* = .24, suggesting that the instrument may be applicable to both females and males without an adjustment in regard to scoring and interpretation. Although females *(M = 12.76, SD = 7.26)* scored slightly lower than males *(M = 13.89, SD = 5.75)*, the resulting effect size was minimal (*d* = .0004).

This study will investigate whether no general differences continue to exist with a greater *N*, as well as whether ethnical differences are present, something Powell and Newgent (2016) did not measure.

Summary

The development of an SUD continues to be a problem for a considerable number of

adolescents. Since this often results in detrimental effects to individuals' physical and mental well-being and has been linked with poorer social, financial, and employment outcomes, as well as an increased potential for unlawful behavior, STIs and unplanned pregnancies, it stands to reason that early detection of an SUD would be necessary for accurate and effective service planning and provision for this population.

Most instruments used in the detection of SUDs among youths rely on self-reported data, which have been demonstrated to threaten the internal validity of the assessment. Inaccurate information provided by the client, whether intentionally or unintentionally, could skew assessment estimates and result in ineffective and potentially harmful interventions.

During the initial development of the JARR (Powell & Newgent, 2016), professionals serving youths referred for assessment and substance use treatment were recruited to score the JARR based on the information contained within three vignettes, and all were found to be able to accurately use the instrument without the aid of training in its use. Interestingly, vocational rehabilitation professionals were not included in the sample of professionals, thus limiting the external validity of the assessment. One of the purposes of this study will be to measure the extent to which approximately 25 vocational rehabilitation counselors can accurately identify a low, moderate, and high risk of juveniles based on information from three standardized vignettes, thus generalizing the findings of Powell and Newgent (2016) to the field of rehabilitation.

Powell and Newgent (2016) also reviewed and applied the JARR to the case files of 313 youths and through correlational analyses utilizing criteria established by the SASSI-A2 (Miller, 1997) and the Y-OQ SR 2.01 (Wells et al., 1996), determined that multiple significant positive relationships existed between most of the 10 scales and total score of the JARR with most of the scales of the SASSI-A2 (Miller, 1997) and most of the scales and total score of the Y-OQ SR

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2.01 (Wells et al., 1996). Since both the SASSI-A2 and the Y-OQ SR 2.01 were used as validity

criteria due to their recognized reliability and validity, initial results strongly suggest that the

JARR measures similar constructs as these two instruments and that the JARR measures what it

purports to measure.

Finally, the risk levels on the JARR were found to be distinct from one another and were

comparable to the respective scoring of the SASSI-A2 and the Y-OQ SR 2.01, further supporting

the JARR as an accurate tool in the assessment for youth addiction risk.

The original study's authors have reviewed and scored an addition 676 case files.   This

study will review the combined data ($N = 989$) to determine if no significant difference is evident

with regards to sex with the larger sample size, while also determining if a difference exists with

regard to ethnicity, something the original authors did not measure.

Chapter III: Methodology

Traditional screening for SUDs among adolescents in the United States has relied greatly on data collected via self-reports to determine substance use status throughout the treatment process due to their ease of use and convenience (Richter & Johnson, 2001). Unfortunately, this information is sometimes inaccurate or incomplete. Reasons for misinformation are numerous and may include the presence of a factitious disorder, denial or pre-contemplation readiness, memory errors, and/or the inherent consequences of situational stimuli.

This confounding prevalence is supported in Williams and Nowatzki's (2005) findings that 28% of adolescent self-reports of substance use were not supported by urinalysis, and concluded that the exclusive use of self-report data in the determination of substance risk had only moderate validity. In response, to the inaccuracies of traditional screening for SUDs, that use self-reported data, Powell and Newgent (2016) developed the Juvenile Addiction Risk Rating (JARR).

Designed as a companion to more popular youth substance use screenings (e.g., SASSI-A2) that rely heavily on self-report data, the JARR (Powell & Newgent, 2016) rates a youth's addiction risk based on historical data. By measuring the degree to which an adolescent has encountered the 10 relevant risk factors found to predict juvenile addiction based on prominent substance abuse literature, Powell and Newgent (2016) proposed that appropriate clinical decisions could be made without a clinical interview since "past behavior is the best predictor of future behavior" (Miller, 1995, p. 49). However, the JARR was not designed as a stand-alone or replacement instrument. It is a complementary screening; first, to confirm self-report data and clinical impressions, and only then a supplemental measure when self-report data is limited, inconsistent or inaccurate.

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Powell and Newgent (2016) were able to statistically validate the JARR as a supplemental measure to traditional self-report methods in the screening of juvenile substance use risk among various professionals. However, they did not investigate whether the instrument would be valuable as a useful measure among rehabilitation counselors. That is the goal of this study.

This chapter describes proposed statistical procedures for expanding upon the findings of Powell and Newgent (2016) to address the following research questions:

1. Would the JARR have statistically significant inter-rater reliability among CRCs?

2. Does the JARR continue to evidence no difference in sex when a larger sample size is used, and if there is a significant difference, is the effect size significant enough to warrant new scoring rules for the populations that might be found to have differences in Total Risk Score?

3. Will the JARR evidence any differences in regards to ethnic category, and if there are significant differences, are the effect sizes significant enough to warrant new scoring rules for the populations that might be found to have differences in Total Risk Score?

In order to effectively accomplish this task, this chapter will address the research design, participants, applied sampling procedures, the instrument (JARR), the variables, and the statistical treatment that will be employed within this study.

Research Design

A non-experimental design consisting of three comparative procedures will be used to determine if the JARR (Powell & Newgent, 2016) is a useful tool for substance abuse screenings in vocational rehabilitation counseling. The first procedure will measure the extent to which a minimum of 26 CRCs can accurately identify low, moderate, and high addiction risk based on

three juvenile case vignettes (Appendices B, C, and D). It is proposed that, similar to the professionals examined during development of the JARR, vocational rehabilitation professionals will also be able to accurately differentiate between the three levels of risk with no training other than that provided in the JARR's directions, which would suggest a strong inter-rater reliability among CRCs, and that the JARR is user-friendly.

The second and third procedures will combine the original data set (case files of juveniles between the ages of 12 and 19) from the time the JARR was developed ($N = 313$), in addition to 676 cases that the JARR's authors collected since ($N = 989$), to determine if differences exist in regards to sex and ethnicity. The data were supplied by the JARR's authors.

Similar to the findings of Powell and Newgent (2016), it is proposed that no significant differences will exist in regards to sex. The authors did not measure ethnical differences, but this study intends to do so in order to further support the findings that the JARR is an effective screener no matter one's sex (i.e., male or female) or ethnicity (i.e., Black/African American, Hispanic, White/Caucasian, and Others) and thus there will be no need to generate separate scoring and interpretation rules based on a person's demographic data.

Participants

Since the original study consisted of 26 participants, this author chose to at least replicate Powell and Newgent's (2016) sample size and use a minimum of 26 CRCs (not represented in the original study) from various public and private VR entities throughout Arkansas, Oklahoma, and other states who were recruited through snowball convenience sampling. A total of 39 participants were recruited. Participants' years of vocational rehabilitation experience ranged from newly certified rehabilitation counselors to retirees.

The second and third procedures analyzed sex and ethnicity differences from a data set of 989 JARRs collected by Powell and Newgent (2016) from the year 2010 to 2015. These data were obtained by reviewing psychosocial case histories of juveniles residing in Arkansas, with the majority living in Northwest Arkansas. The youth were referred for substance abuse assessments (SAAs) by local juvenile courts, schools, parents, mental health counselors and the Division of Youth Services (DYS). Ages range from 12 to 19, and both male and females will be included, as well as the following ethnicities: (a) White/Caucasian, (b) Black/African American, (c) Hispanic or Latino/Latina, (d) Native American, (e) Asian, (f) Arabic, and (g) Marshallese. The sample's academic level will range from 7th grade to some college, with participants being in either alternative school, public school, expelled, in possession of a diploma or GED, attending college, or actively obtaining a GED.

Sampling Procedures

The first procedure used convenience sampling to recruit the CRCs. Participants were contacted via email and asked to volunteer for the study. Upon agreement, they were given three vignettes representing a low, moderate and high risk case for juvenile addiction. The participants also received a JARR and were required to complete one JARR for each vignette. The CRCs received no training on how to complete, interpret, or score the JARR so that the author could investigate Powell and Newgent's (2015) assertion that the JARR is a user-friendly screening tool use for all professionals, including VR counselors. Upon completion, each participant was required to return their JARRs via email so that the data could be analyzed.

The second and third procedures analyzed a data set consisting of scores from 989 JARRs collected during and following the instrument's development (Powell & Newgent, 2016). The original study reviewed 313 juvenile case histories conveniently selected from psychosocial

histories and SAAs conducted by certified and licensed substance abuse counselors from the year 2010 to 2013 at a Northwest Arkansas youth co-occurring treatment facility. The authors have continued to collect JARR data since that time (2013 to 2015), and these data were combined with the original 313 to provide this study's total sample ($N = 989$).

Instrument

The JARR is a brief, 10-item screen used with adolescents to determine their potential for substance addiction. Developed in response to the inherent challenges of making treatment recommendations based on teenage self-report data, the JARR measures an individual's risk of addiction by investigating his or her psychosocial history, rather than self-perceptions about current misuse. Guided by the idea that "past behavior is the best predictor of future behavior" (Miller, 1995, p. 49), the JARR investigates a youth's exposure to 10 risk factors found via content analysis to best forecast adolescent substance addiction. The 10 factors measured on the JARR are as follows:

- Substance Use History

- Mental Health History

- Family History of Addiction

- Strength of Family Relationships

- Peer Selection

- School-Related Difficulties

- Aggression and Violence

- Juvenile Delinquency

- Attitude Toward Substance Use

- Extent of Substance Use

Four multiple-choice responses were developed for each category. They range from 0 (low risk) to 3 (high risk) – the greater the severity, the greater the risk. The example given by Powell and Newgent (2016) is in regard to item number five, *Peer Selection*. A score of zero on this item reads as: "Very few close peers; if any, are suspected of or reportedly using substances," whereas a score of three reads as: "Most of close peers have substance-related arrests, are in SA treatment, and/or report being in recovery." The item in its entirety reads as follows:

Peer Selection

0. Very few close peers, if any, are suspected of or reportedly using substances.

1. Has a mixed peer group, with some non-using friends and some suspected of or reportedly using substances.

2. Most of close peers are suspected of or reportedly using substances; or several peers with drug-related arrests.

3. Most of close peers have substance-related arrests, are in SA treatment, and/or report being in recovery.

Scores are then summed for all 10 items, and a total risk score determines one's level of risk.

The JARR's (Powell & Newgent, 2016) inter-rater reliability was determined after 26 professionals (e.g., mental health counselors, probation officers, alternative school educators) were asked to complete a JARR on three juvenile case vignettes that represent a low, moderate and high risk youth. None of the participants were given instructions on how to use the JARR in order to test its simplicity and usability. Analyses found that there was 100% agreement in discriminating between the three levels of risk with a Cronbach's alpha of .81. These results indicated that the JARR is user-friendly, and that various experts could accurately screen for juvenile addiction risk.

Powell and Newgent (2016) used various statistical analyses for validation purposes. First, an exploratory factor analysis was conducted to reveal that the 10 JARR items measure a single clinical attribute (i.e., addiction), supporting the instrument as an addiction risk screening. Second, data revealed that no sex differences existed in the total score, suggesting there is no need for separate scoring rules when interpreting the results on the JARR among males and females. Third, convergent validity estimates were determined by comparing JARR risk ratings with the SASSI-A2 (Miller, 1985) scoring rules. Analysis revealed that a high risk JARR significantly correlated with a high probability of dependence on the SASSI-A2, while a moderate risk JARR correlated with a high probability of abuse, and a low risk JARR correlated with a low probability scoring rule on the SASSI-A2. Fourth, the JARR total scores were compared to the Y-OQ 2.01 SR total distress scores (Wells et al., 1996). Analysis revealed that the greater the JARR score, the greater the distress as measured on the Y-OQ 2.01 SR. Last, the JARR risk ratings were compared to the DSM-IV-TR diagnoses assigned to the cases that Powell and Newgent (2016) reviewed. A chi square analysis revealed that the risk levels on the JARR were predictive of severity of diagnostic category. That is, low risk on the JARR was related to no diagnosis and a high risk on the JARR was related to dependency.

Variables List

Once all 10 JARR items are scored, they are summed and a total score is derived to determine the overall addiction risk rating. The risk ratings are as follows:

Low Risk	0 to 8
Moderate Risk	9 to 18
High Risk	19 to 30

The 26 CRCs sampled for procedure 1 will assign these ratings to the three vignettes that represent a low, moderate and high risk, respectfully. The ratings will serve as the dependent variable.

Analysis of the second and third procedures will use *sex* and *ethnicity* as the independent variables, respectively, while the JARR total score will serve as the dependent variable. Since this study will not incorporate an experimental design, control variables will not apply.

Statistical Treatment

Data will be analyzed with International Business Machine Inc.'s Statistical Package for the Social Sciences (IBM SPSS, 2013), and the following research hypotheses will be tested with appropriate statistical methodologies.

Hypothesis 1. Just as Powell and Newgent (2016) found remarkably high inter-rater reliability among mental health professionals, CRCs serving in varying positions within the field of vocational rehabilitation, with no specialized training in how to do so, will also accurately score the JARR to three vignettes of cases representing low, moderate and high levels of risk.

Hypothesis 2. An analysis of the larger sample size ($N = 989$) will support the findings of Powell and Newgent (2016) that no significant difference is present in the total scoring outcomes on the JARR in regard to an individual's sex.

Hypothesis 3. There will not be a significant difference in total scoring outcomes on the JARR in regard to ethnicity.

Descriptive statistics will be used to summarize measures of central tendency (e.g., mean, median, and mode) as well as measures of dispersion (e.g., range, variance, and standard deviation from the mean) in the reporting of CRCs scoring of low, medium, and high risk cases depicted in three distinct vignettes. Independent-samples *t* tests assess whether the means of two

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groups statistically differ. For the purposes of this study, an independent-samples t test will be conducted to analyze sex differences within total scores of the JARR. Finally, since a one-way analysis of variance (ANOVA) is the most commonly applied method used to determine whether differences exist between the means of three or more independent groups, for the purposes of this study, a one-way ANOVA will be employed to analyze differences of total scores among varying ethnicities. Post hoc tests (e.g., Tukey HSD) may be applied to investigate significant differences, should they be found, as well as effect size measurements to determine greatness of differences, if any.

Summary

Three procedures will be used to determine if the JARR (Powell & Newgent, 2016) is a useful tool for substance abuse screenings in vocational rehabilitation counseling settings. The first procedure will measure the extent to which certified rehabilitation counselors can accurately identify a low, moderate and high risk juveniles based on three vignettes. The second procedure will combine the original data set from the time the JARR was developed ($N = 313$) with an additional 676 cases that were collected since, to determine if no significant difference still exists in regards to sex as indicated by the authors ($N = 989$). The final procedure will combine all data and determine if there is a difference in regards to ethnicity, something the original authors did not measure.

This study will be conducted upon the approval of the University of Arkansas Institutional Review Board. All data are and will remain anonymous. Data will be analyzed with IBM SPSS, via descriptive statistics, independent-samples t tests, and one-way analysis of variance (ANOVA). Post hoc tests may also be applied if deemed necessary.

Chapter IV: Results

The purpose of this study was to expand upon the work of Powell and Newgent (2016) to determine whether the Juvenile Addiction Risk Rating (JARR) might contribute to the vocational rehabilitation (VR) field by serving as a supplement in the assessment of substance use among adolescents seeking VR services. This was attempted in a series of three procedures to address three research questions. The first procedure investigated whether the JARR would have statistically significant inter-rater reliability among CRCs as was found with mental health and substance abuse professionals in Powell and Newgent's (2016) study. The second procedure investigated whether Powell and Newgent's (2016) findings of statistically insignificant differences between sexes in JARR total scores would continue to be supported with an additional 676 case files added to the original data ($N = 989$). The third was to examine whether statistically significant differences in JARR total scores were evident between represented ethnicities, factors not explored in Powell and Newgent's (2016) study.

Procedure One

The first research hypothesis stated that CRCs would accurately score the JARR with no formal training on administration or scoring rules. This was accomplished by instructing CRCs to complete a JARR for three vignettes that were provided by the instrument's authors as representative of a low, moderate and high risk youth. Participants received the task packets containing the vignettes and JARRs via email and hand delivery. The participants did not receive any specific instructions regarding how to complete the JARR. The purpose was to explore whether CRCs who serve in varying positions within the field of vocation rehabilitation would accurately score the instrument without specialized training.

Descriptive statistics. All participants ($N = 39$) were CRCs. Twenty-seven women and 12 men were recruited via verbal invitation and email from among known CRCs. Snowball recruitment resulted in participants from Arkansas ($n = 23$), Colorado ($n = 1$), Georgia ($n = 1$), Illinois ($n = 1$), Kentucky ($n = 1$), Michigan ($n = 1$), Minnesota ($n = 1$), Nevada ($n = 1$), New Hampshire ($n = 1$), New York ($n = 1$), Oklahoma ($n = 3$), Oregon ($n = 2$), and Wisconsin ($n = 2$). Length of certification ranged from five months to 27 years, with a mean of 7.82 years, and a standard deviation of 6.48. The median length of certification was 6.00 years. Of the respondents, 37 identified themselves as White/Caucasian, one as Black/African American, and one as Interracial (American Indian and White/Caucasian). Fifteen of the respondents reported working for public rehabilitation agencies, while 8 reported working for private non-profit agencies, 5 cited having positions in private for-profit agencies, 8 reported working in education, 1 listed a position in a corrections setting, and 1 reported working for the Veteran's Administration. One participant reported being unemployed.

Results. Analyses of the CRC's ($N = 39$) total scores, which range from 0 to 30 on the JARR, for the three vignettes supported Powell and Newgent's (2016) findings that the vignettes were discrete and distinctive representing the three levels of SUD risk (low, moderate, and high). Unlike Powell and Newgent (2016) there was not 100% agreement between the CRC raters on each of the vignettes. Among the respondents, 34 scored all the vignettes accurately. None of the participants inaccurately scored Vignette 2 ($M = 1.59$, $SD = 1.37$, range = 0-6) representing an individual at low risk for the development of an SUD. Three of the participants incorrectly scored Vignette 1 ($M = 12.82$, $SD = 2.65$, range = 6-20) representing an individual with a moderate risk for the development of an SUD, with two of the three identifying the individual as low risk, and one identifying the individual as high risk. Two participants incorrectly scored

Vignette 3 ($M = 22.10$, $SD = 1.96$, range = 15-26) representing an individual with a high risk for the development of an SUD, concluding the individual was at moderate risk. JARR scoring accuracy is shown in Table 1.

Table 1

Vignette Scoring Accuracy (N = 39)

Vignette Number	Correct Score Count	Correct Score Percentage (%)
Vignette 1 (Moderate Risk)	36	92.31%
Vignette 2 (Low Risk)	39	100%
Vignette 3 (High Risk)	37	94.87%

Note. $N = 39$.

Procedure Two

The second research hypothesis was that Powell and Newgent's (2016) findings that differences in JARR total scores between sexes were statistically insignificant, would continue to remain within a larger sample size ($N = 989$). This was accomplished by analyzing pre-existing data collected by the developers of the JARR.

Descriptive Statistics. Data were analyzed from youth case histories ($n = 989$) obtained between 2010 and 2015 from a mid-south agency. All of the youth had been residing in the same mid-south state and had been referred for treatment assessment by juvenile probation officers (781), the Department of Human Services and its divisions (113), self/guardians (50), schools (25), drug courts (16), counselors (3) and a hospital (1). The adolescents (751 male and 238 female) ranged in age from 12 - 19 years ($M = 13.98$, $SD = 6.23$) with ethnicity comprised of 60.6% White/Caucasian, 26.5% Hispanic, 9.2% Black/African American, and 3.7% Other ethnicities. Of the 989 youth, 60.7% were in traditional educational environments, 24% were in an alternative school programs, 4.9% had GEDs, 3.3% were expelled, 1.8% had dropped out of

school, 1.4% had high school diplomas, and the remainder were either home schooled (1.9%) or received special education services (2.0%).

Results. An independent-samples t-test was conducted to compare JARR Total Scores among males and females. For a more conservative outcome, equal variance was not assumed. There was not a significant difference among the JARR Total Scores for males (M=13.94, SD=6.04) and females (M=14.10, SD=6.80); t(362.95)= -.334, p = .738. Figure 1 displays the differences of JARR total score means between males and females.
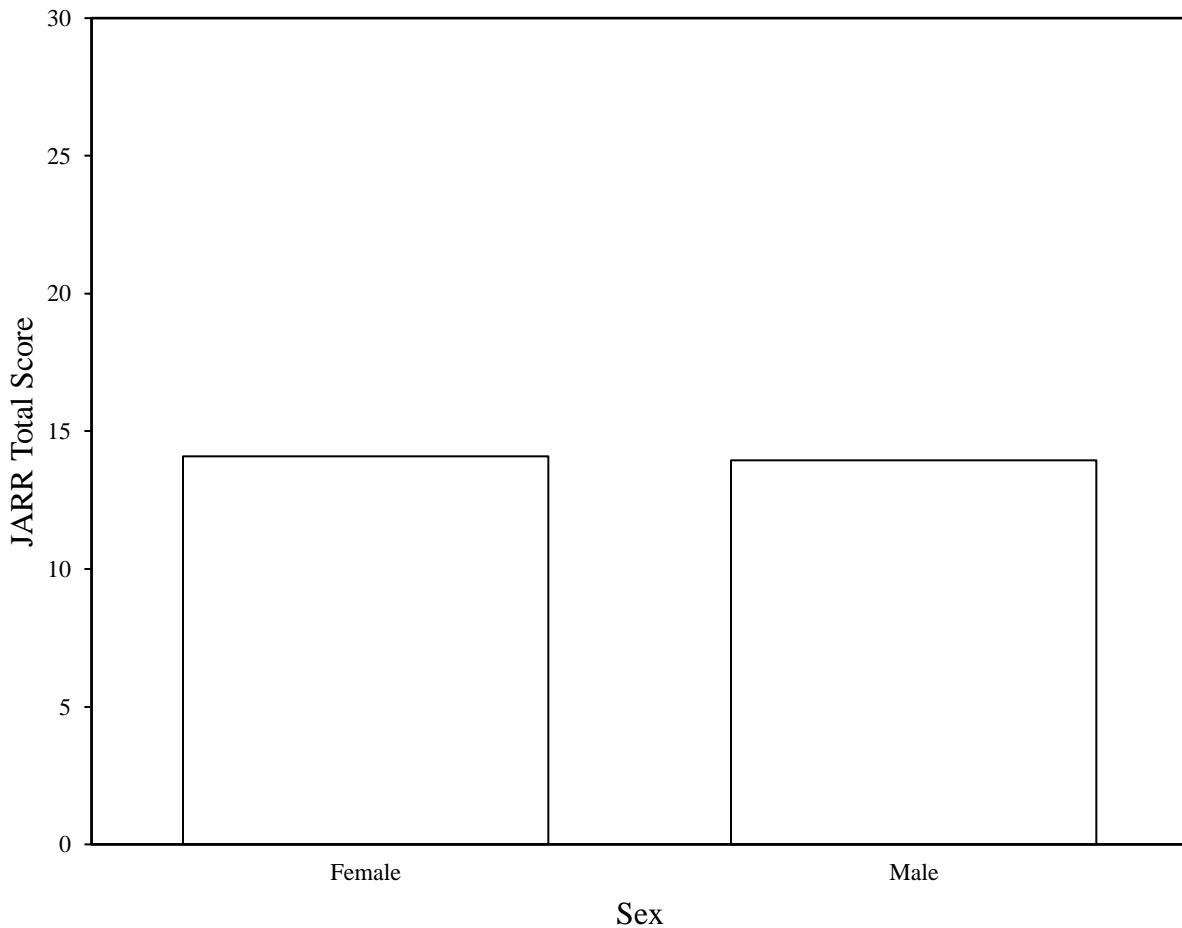
Figure 1. *Sex differences of JARR total score means.*

Procedure Three

The investigation of the third research hypothesis, that there will not be a significant

difference in total score outcomes on the JARR in regard to ethnicity, was accomplished by

reviewing the same data source that was used in the second procedure. The represented

ethnicities included, Black/African American ($n = 91$), Hispanic ($n = 262$), White/Caucasian ($n = 599$), and Other ($n = 37$).

      Results. A one-way between subjects ANOVA was conducted to compare the effect of

ethnicity on JARR total scores among Black/African American, Hispanic, White/Caucasian, and

Other ethnicities. There was a statistically significant difference of JARR Total Score at the $p < .05$ level for the four conditions [$F(3, 985) = 3.67, p = 0.012$]. Post hoc comparisons using the

Tukey HSD test indicated that the mean JARR total score for White/Caucasian participants ($M = 14.28, SD = 6.35$) was significantly higher than the mean JARR total score for Hispanic

participants ($M = 12.95, SD = 5.68$). Black/African American participants ($M = 14.32, SD = 6.64$) and members of the Other category ($M = 15.46, SD = 6.12$) did not significantly differ

from each other or any of the other conditions. It should be noted that though statistical

significance was present, an eta squared calculation revealed the effect size to be .01. According

to Cohen (1988) an eta squared of .01 is representative of a small effect size. Table 1 shows the

JARR total score means between the represented ethnicities as found by Tukey HSD.

Table 2

Tukey HSD: Multiple Comparisons of JARR Total Scores Between Represented Ethnicities

					95% Confidence Interval	
Ethnicity	Ethnicity	Mean Difference	Std. Error	Sig.	Lower Bound	Upper Bound
Black	White	.0382	.6976	1.000	-1.757	1.833
	Hispanic	1.3683	.7545	.267	-.573	3.310
	Other	-1.1408	1.2089	.781	-4.252	1.970
White	Black	-.0382	.6976	1.000	-1.833	1.757
	Hispanic	1.3301*	.4593	.020	.148	2.512
	Other	-1.1790	1.0503	.676	-3.882	1.524
Hispanic	Black	-1.3683	.7545	.267	-3.310	.573
	White	-1.3301*	.4593	.020	-2.512	-.148
	Other	-2.5091	1.0889	.098	-5.311	.293
Other	Black	1.1408	1.2089	.781	-1.970	4.252
	White	1.1790	1.0503	.676	-1.524	3.882
	Hispanic	2.5091	1.0889	.098	-.293	5.311

Note. * The mean difference is significant at the 0.05 level.

Summary

The purpose of this study was to investigate whether CRCs could accurately score the JARR, whether differences in JARR total scores existed between sexes, and whether differences in JARR total scores existed between varying ethnicities as represented by Black/African American, Hispanic, White/Caucasian, and Other ethnic categories. The research hypotheses were explored through the application of three procedures.

A total of 39 CRCs participated in the first procedure and were asked to read three vignettes and score a JARR for each based on the information within each vignette. The vignettes were reflective of individuals of moderate, low, and high risk for SUD respectively. No specific instructions in how to score the JARR were provided. In sum, CRCs ($N = 39$) inaccurately scored the vignette depicting an individual at moderate risk for SUD three times

(92.31% accuracy) and the vignette depicting an individual at high risk twice (94.87%). None of the vignettes depicting an individual at low risk for an SUD were scored inaccurately. When considering all 117 assessed vignettes, CRCs scored with 95.73% accuracy.

The second procedure employed the use of a database ($N = 989$) collected by the JARR's authors. An independent samples t-test was used to investigate whether JARR total score differences existed between males ($n = 11$) and females ($n = 23$). No significant difference was found between males (M=13.94, SD=6.04) and females (M=14.10, SD=6.80); t(362.95)= -.334, p = .738.

The third procedure also employed the use of the database (N = 989) collected by the JARR's authors. A one-way ANOVA was employed to investigate whether JARR total score differences existed between various ethnicities as represented by Black/African American, Hispanic, White/Caucasian, and Other ethnical categories. A statistically significant difference was found, and a Tukey HSD post hoc test identified White/Caucasian cases (M = 14.28, SD = 6.35) were scored higher than Hispanic cases (M = 12.95, SD = 5.68), but an eta squared found the effect size to be small. No significant differences were found between Black/African American cases (M = 14.32, SD = 6.64), cases representing other ethnicities (M = 15.46, SD = 6.12), nor were either significantly different from Hispanic and White/Caucasian cases.

Chapter 5: Discussion

The purpose of this chapter is to review the justification for this study, provide a summarization of its procedures and limitations, present conclusions of its findings, and explore implications for the practicing rehabilitation professional and future research. This is accomplished through a restatement of the problem, research hypotheses, and the investigative procedures followed by investigative conclusions, limitations of the study, implications for vocational rehabilitation, and a call for future research.

Statement of the Problem

Early detection of substance use disorders (SUDs) in adolescence is vital because early intervention has been found to have the greatest success in preventing addiction (SAMSHA, 2012). Assessing youth with standardized screening instruments is the most effective means for determining such needs. Unfortunately, several limitations exist in substance use screening, especially when the data are obtained via self-report, as this type of gathered information lends itself to such confounding variables as inconsistencies, insufficient or defensive reporting, denial and/or malingering.

One solution suggested by Powell and Newgent (2016) is the use of collateral data during screening, especially when such confounds exists. Guided by the assumption that past behavior is the best predictor of future behavior, Powell and Newgent developed the JARR to determine the likelihood that a youth would be at-risk based on 10 factors found within the literature to predict juvenile addiction. At this time, however, the JARR has only been shown to be useful in the field of mental health. It has not been validated for use in the vocational rehabilitation setting. This study attempts to investigate whether the instrument might also benefit vocational rehabilitation professions who serve youths.

Statement of the Procedures and Conclusions

This study's methodological procedures were developed to investigate the three following research hypotheses:

1. CRCs serving in varying positions within the field of vocational rehabilitation, with no specialized training in how to do so, will also accurately score the JARR to three vignettes of cases representing low, moderate and high levels of risk.

2. An analysis of the larger sample size ($N = 989$) will support the findings of Powell and Newgent (2016) that no significant difference will be present in the total scoring outcomes on the JARR in regard to an individual's sex.

3. There will not be a significant difference in total scoring outcomes on the JARR in regard to ethnicity.

Procedure One. To accomplish the first research goal, the first procedure was developed to investigate whether CRCs could consistently accurately score the JARR based on information contained within three vignettes representing adolescents of low, moderate, and risk provided by the developers of the JARR as representative of adolescents of low, moderate, and high risks for SUD.

Results of the first procedure found a high inter-rater reliability among CRCs scoring JARRs for the three vignettes depicting juvenile cases of low, moderate, and high risk for SUD. Of the 39 participating CRCs 34 (87.18%) scored all three vignettes correctly. The vignette depicting an example of an individual of moderate risk for development of an SUD was scored inaccurately three times, followed by the vignette depicting an example of an individual of high risk for an SUD which was scored inaccurately twice. Only the vignette depicting an example of

an individual of low risk for development of an SUD was scored accurately by all of the participants.

Though these findings differ from Powell and Newgent's (2016) results in which they obtained 100% accuracy from non-CRC providers, this current study obtained a 95% accuracy among the 117 JARRs (only five were inaccurate). Since among the 117 JARRS the participants were 100% accurate at identifying a low risk cases, this indicates that when those 39 low risk vignettes are removed from the sample, the CRCs will only be inaccurate 6% of the time when using the JARR on moderate and high risk cases (5 of the 78 cases). However, it could be assumed that this 6% inaccuracy would decrease once a CRC received the appropriate training. Therefore without training, obtaining a 94% accuracy on moderate to high risk cases (or 95% on all cases) seems impressive, and helps support the assumption that the JARR is a valid and reliable instrument in the assessment of adolescents at risk of SUD.

Procedure Two. The second procedure investigated whether differences in JARR total scores were evident between males and females by merging and analyzing Powell and Newgent's (2016) original data (*N*=313) with an additional 676 cases (*N*=989). Results of an independent samples *t* test of the 989 JARR total scores found no significant statistical difference between males and females. This supports Powell and Newgent's (2016) assumption that no modification of the instrument is needed when assessing individuals of different sex.

Findings such as this further support the JARRs ease of use for CRCs when screening addiction risk among the juvenile population. A service provider would not require a different set of scoring rules or interpretation procedures based on the examinee's sex. For example, a score of 13 for a male (moderate risk) has the same weight and operational definition as a score of 13 for a female. This will help ensure greater accuracy in scoring, prevent counselor confusion or

sex bias, and help decrease inaccurate risk labeling when planning and recommending the appropriate level of service based on the youth's identified need.

      Procedure Three. Finally, the third procedure investigated whether differences in JARR total scores were evident between varying ethnicities by analyzing the same dataset used in the second procedure. Results of a one-way ANOVA of the 989 JARR total scores found a statistically significant difference between ethnic categories. A post hoc test (Tukey HSD) found the difference to be between the categories of White/Caucasian and Hispanic. However, an eta squared calculation revealed that the effect size was small (.01), suggesting that different scoring procedures for members of the representative ethnical categories is not necessary. No statistically significant differences were found between the other ethnic categories.

      Again, findings such as this further support the JARRs ease of use for CRCs when screening addiction risk among the juvenile population. A service provider would not require a different set of scoring rules or interpretation procedures based on the examinee's ethnicity. Despite the fact that a statistically significant difference was found between White/Caucasian and Hispanic ethnicities, the difference is accounted for by the large sample size as determined by the fact that the effect size of such a difference was small (.01). Therefore, the same scoring rules apply with all represented ethnicities, as well as it does with represented sexes. Therefore, for example, a score of 13 for a Hispanic male (moderate risk) has the same weight and operational definition as a score of 13 for a Black female. These findings support Powell and Newgent's (2016) claims that the JARR is useful, accurate, and free from bias/variation when interpreting scores.

Limitations of the Study

      Although the results of this study support Powell and Newgent's findings that the JARR

may be a reliable and valid assessment instrument in the detection of SUD risk among adolescents, several limitations exist.

Sampling. Convenience sampling was applied in the recruitment of the 39 CRCs. Though this method was practical due to limited access to a large number of participants, it nonetheless diminished the ability of the researchers to generalize this study's findings to CRCs at large. Moreover, this study's sampling method resulted in an over representation of White/Caucasian participants ($N = 39$) and an under representation of ethnic minorities ($n = 2$). The 2014 U.S. Census listed White alone (not Hispanic or Latino) as comprising 62.1% of the population, considerably less than the 94.87% represented in this study.

The same sampling concern applies to the 989 cases collected by the JARR's authors and used in this study to investigate whether JARR total score differences exist between males and females, and whether JARR total score differences exist between varying ethnicities (Black/African American, White/Caucasian, Hispanic, and Others). All of the 12 to 19-year old adolescents represented in the 989 cases were receiving outpatient substance abuse counseling from the same community mental health agency in Northwest Arkansas. This restricts the generalization of this study's findings to individuals with similar demographic profiles.

Vignettes. Limitations were found within the development of the vignettes, specifically the differing specifications of sex and ethnicity between vignettes, thus not controlling for extraneous variables that may have affected CRC responses. The individual depicted in the first vignette was described as a "14-year-old, Hispanic male" while the person in the second vignette was identified as "a 17-year-old, White/Caucasian female" and the third was cited as "a 16-year-old, White/Caucasian male." Therefore ethnical and sexual traits of the depicted individuals cannot be ruled out as possible factors biasing CRC scoring. Thus when considering Vignette

One being scored inaccurately more often than the other two vignettes, the investigators could not rule out the possibility that the description of the individual (i.e., 14-year-old Hispanic male) contributed to the occurrence.

Furthermore the vignettes provided by the JARR's authors were not identical to the vignettes used in the original study. Therefore an exact comparison of CRC scoring outcomes could not be compared with the mental health and SUD professionals' scoring outcomes in the original study.

Data Collection. Another limitation included the fact that the integrity of the data supplied by the JARR's authors was reliant on the collectors' (certified and licensed substance abuse counselors) honesty and data-collecting skill.

JARR. Though not a limitation of this study's methodology, it should be noted that of the ten JARR items none are completely shielded from the constraints of self-reported data, because information contained within collateral sources are often derived from clinical interviews with the individual. In the case of medical and psychological exams, symptoms that cannot be directly observed (e.g., physical and mental discomfort, thoughts, and emotions) are often based on client self-report. That is, at some point in the past the data was derived from what the youth or stake holder may have reported. However, once the information has been documented, it becomes a matter of record that cannot be minimized, denied or manipulated at a later time during subsequent interviews. This is in contrast to interviews relying on self-report that do not take into account previous interviews, as though the client is being interviewed for the first time.

Implications for the Field of Vocational Rehabilitation

It is not uncommon for people with disabilities to experience SUDs. Research points to individuals with spinal cord injuries and psychiatric disorders being most at risk, and have estimated that 2% to 33% of VR consumers present with co-occurring SUDs (Heinemann, Moore, Lazowski, Miller, & McAweeney, 2008). With studies supporting the assumption that employment during substance abuse treatment is linked with improved probability of tenure and successful outcomes (Platt, 1995), it stands to reason early detection of SUD risk among juvenile VR consumers would be imperative for successful school to work transition planning.

As much of the client's wellbeing is in the balance, it is imperative VR professionals use the most reliable and valid instruments in the assessment of SUD risk. However, a review of the literature revealed few SUD risk assessment instruments have been validated for use in VR settings, and none have been validated for adolescents seeking VR services. This study contributes to the literature by presenting a possible user-friendly, brief, and accurate companion instrument to the juvenile VR SUD risk assessment process. VR counselors assessing SUD risk who are confronted with ambiguous, inaccurate, or missing self-reported information are thus presented with an instrument that does not solely rely on self-reported data, but instead is based on information from collateral sources (e.g., school records, psychological evaluations, and court reports). Since effective service planning relies on accurate information, it becomes apparent that an instrument free of reliance on information that could be distorted or altogether untrue, would be valuable to the VR service provider.

This study points to inconsistences within state vocational rehabilitation programs regarding SUDs and treatment eligibility. The most prominent being the recognition of SUD as a psychiatric disorder meeting eligibility criteria for vocational rehabilitation services. Presently

approximately half the United States' public rehabilitation programs serve consumers with primary and secondary SUD diagnoses as a part of VR treatment. Furthermore these programs have reported an increased likelihood of successful closures when VR services were tailored to counter the barriers of SUD symptomology, with supported employment interventions being especially important to the process (McAweeney, Keferl, Moore, & Wagner, 2008).

However, other states require periods of abstinence prior to eligibility for services. Detection of an SUD among VR clients could result in postponement or termination of services (Moore, McAweeney, Keferl, Glenn, & Ford, 2008). As a result many VR applicants conceal their conditions.

Without formal SUD risk assessment procedures, public VR service professionals often rely on their feelings/instincts when determining risk level. This tactic becomes more complicated when contradictions arise within the consumer's narrative, or conflicts become evident between consumer recollection and collateral accounts. Symptoms of intellectual and psychiatric disabilities might also contribute to inaccurate information volunteered by the client. Since people with intellectual and psychiatric disabilities make up a large portion of most VR counselors' caseloads, this dilemma is a common occurrence. With the lack of assessment tools and SUD specific training, it is not surprising VR counselors tend to rank themselves low in competence to effectively serve clients with SUDs (Glenn and Keferl, 2008).

Overall, the findings of this study suggest the JARR may be helpful to VR counselors who must make vital decisions about functional limitations, the need for SUD treatment referral, development and revision of IPEs, allocation of funding and other resources, ongoing case management and follow up services, yet are confronted with inaccurate and missing data.

However, though this study supports Powell and Newgent's (2016) findings, if falls short of full endorsement of the JARR. Several questions regarding extraneous variables (e.g., possible vignette structural flaws and non-randomized participants) continue to place concern on the power of its findings. Rather, this study presents the JARR as an instrument with potential for assisting VR counselors in the assessment of SUD risk among juvenile clientele, but with the caveat that future studies must address and correct this study's limitations.

Presently, the JARR stands alone as the only instrument available that addresses SUD risk among adolescents in vocational rehabilitation settings. This makes incremental validity impossible to establish since there is nothing with which to compare it. The value of this study rests in the crucial need for valid and reliable SUD risk assessment instruments in the improvement of clinical decision making; therefore the JARR is presented as a possible supplement to standard self-report assessment processes. In the SUD assessment process there has been a need for a more precise way to determine a youths' level of risk which has been solely estimated using self-report measurement. The JARR fills this gap by offering clinicians opportunities to make treatment decisions based on data that is not confounded by the limitations inherent in self-reported data. When self-report data is skewed, the JARR can still be relied on as a valid indicator of one's risk.

With respect to the limitations of this study, the JARR holds promise as a companion to contemporary SUD risk assessments procedures. Determining the degree of an adolescents' substance use disorder, and its effect on other life areas is crucial for thorough diagnosis, proper case management, and successful treatment outcomes. The obtaining of this knowledge starts during the screening and assessment phase, and is used to coordinate appropriate treatment services for the client. In order to get this information, it is important that standardized

instruments, such as the JARR, be included in treatment protocol to ensure that data is a free as possible from confounding variables that may distort findings. Typically, screenings for substance use disorders are done by structured and unstructured interviews and/or self-report questionnaires, both of which are subject to inaccuracies inherent in human recollection and intentional deceit.

Since a goal of the VR assessment process is to detect risks and barriers to employment including symptoms of SUD, and since that most risk assessments gather information through a means with inherent vulnerabilities (i.e., self-report) the JARR is presented as a possible alternative to reliance on vulnerable data and service provider instincts. Consisting of 10 Likert-type items on two pages, the instrument is concise and uncomplicated, both of which are important for rehabilitation counselors with caseloads well over 100 consumers.

In addition to brevity and simplicity, cost is another factor VR counselors might consider when choosing an adolescent SUD risk assessment. The JARR is free of charge, and easily downloadable from its website. Thus the JARR may fiscally benefit agencies as no overhead expenses are incurred in the obtaining and use of the instrument.

Future Research

This study attempted to present information about the use of the JARR as a tool for SUD assessment free of the inherent problems with self-report instruments. Its aim was to build upon the findings of Powell and Newgent's (2016) original study to determine if the instrument could be successfully expanded beyond the mental health and SUD counseling arena to that of vocational rehabilitation counseling. Some important findings were identified as a result of this investigation.

First, it was evident there was not 100% interrater reliability among the CRC participants as was reported among the service professionals in the original study. Unfortunately a direct comparison of the two populations' scores could not be conducted due to vignette differences among the two studies. Future studies exploring the use of the JARR across disciplines and applying similar methodology should standardize vignettes so that comparisons of performance between service branches can be analyzed. Another suggestion would be providing the participants in this study with the appropriate scoring rules and seeing if their level of accuracy improves.

Furthermore future investigations using similar methodology should develop and apply vignettes that do not incorporate extraneous and/or confounding variables such as individuals' names, ages, sexes, and ethnicities. Rather, demographic information within all of the vignettes should be identical. Though ethnicity and sex are not factors directly measured within the ten items of the JARR, the placement of this information within the vignettes inserts variables too difficult to distinguish and control in the scoring process.

In the same vein, future research might explore potential for cultural bias within the JARR's ten items as scores may present disproportionately high or low due to a lack of cultural awareness on the part of the rater or the authors of the collateral data. For example, school-related difficulties might be resultant of, or exasperated by, cultural differences between the juvenile and school faculty; charges of aggression and violence might be initiated and/or amplified due to racial profiling; and friends and peers might be suspected of using illicit substances due to cultural stereotyping.

This study supported Powell and Newgent's (2016) finding that the JARR may be applied to both males and females without the need for modification based on insignificant

differences in the total score means of 989 adolescents who presented for SUD assessment at the same treatment facility. This is interesting because the literature identifies profound differences in the way substances affect males and females, including SUD assessment performances (Finkelstein, 2009) as well as how. The JARR does not address these differences within any of its 10 items.

However, this study did find a statistically significant difference between the JARR total score means of White/Caucasian and Hispanic ethnicities, albeit with a small effect size. Questions regarding the reason for this discrepancy might prompt future research as well.

An important undertaking for future studies of the JARR and similar instruments would be the development and application of assessment methodologies that take into account the changing demographics of the United States, as the majority of the nation's populace will soon be comprised of ethnic minorities. The shifting of cultural perspective may have a profound impact on the traditional approaches to SUD assessment and treatment procedures. Cultural sensitivity is imperative if accurate assessment across a broad range of ethnic and cultural backgrounds is to be successful.

Continued research of the JARR in rehabilitation settings might also include phenomenological qualitative investigations of VR counselors' perspectives. With this approach, personal experiences of VR counselors regarding the assessing of clients with SUD and the JARR's contribution to the process could be more thoroughly explored and documented. Such an investigation might result in valuable data suggestion areas for improvement of the instrument. Also further exploration of feelings of inadequacy reported by VR counselors toward SUD assessment, and how the JARR might be seen as helping or hindering the process.

Perceived barriers to implementation of the instrument could be documented and addressed as modifications of the instrument are considered.

Additionally, future studies of the JARR should strive to incorporate random sampling procedures whenever possible to more accurately reflect population behavior and present more generalizable findings.

While the scale of this study is modest in comparison to those of large testing entities (e.g., Pearson, Measured Progress, McGraw Hill, and Data Recognition Corporation) it should be remembered this is only the initial development of the instrument. Powell and Newgent's (2016) study was comprised of 25 participants and 313 case files while this study was able to expand the scale to include 39 participants and 989 case files. Presently generalization based on this study leads to confounds regarding non-Caucasian participants and populations outside of Northwest Arkansas. The next stage would be to build even greater samples from other regions with varying demographics to determine whether similar results would be found, increasing the likelihood of generalization to the population at large. With time and a greater breadth of data that span across other regions of the country, findings may suggest that the JARR has the potential to be equivalent to other products owned and marketed by big test companies.

Summary

One of the primary goals of vocational rehabilitation practitioners is the improvement of quality of life for people with disabilities through the successful placement of clients into gainful employment. This procedure requires accurate assessment so that the provision of appropriate services might be conducted. Most assessments during the intake process, including those of SUD risk, rely on information obtained via client self-report. Unfortunately, for a variety of reasons, self-reported information is often open to intentional and unintentional inaccuracies.

The authors of the JARR asserted that since it does not rely one self-reported information in the formulation of findings, it provides the service provider assessing SUD risk with an instrument to assist when the validity of self-reported information may be in doubt. Powell and Newgent's (2016) study found the JARR to be a valid and reliable instrument in the assessment of SUD risk in a mental health and substance use treatment setting, as was evident with remarkably high interrater reliability (100%) among mental health and substance use service providers from information provided within three vignettes depicting low, medium, and high risk of SUD. Furthermore no significant differences in the JARR total scores of male and female adolescents were found among 313 clients referred for substance abuse treatment. The purpose of this study was to expand upon the work of Powell and Newgent (2016) to determine if the JARR might also be a useful tool in VR settings by investigating whether CRCs could also accurately score the JARR. Additionally this study investigated whether no differences continued to not be present with a larger sample size (N = 989). This study also investigated whether there was a difference in JARR total scores between various ethnical categories represented by Black/African American, White/Caucasian, Hispanic, and Others.

This study did not find 100% interrater reliability, however of the 117 vignettes scored by CRCs, only 5 (4.27%) were scored inaccurately. Interestingly, Vignette 1 which depicted a Hispanic male was inaccurately scored 3 times, while Vignette 3 depicting a Caucasian male was inaccurately scored once. The vignette depicting a Caucasian female was scored accurately by all the participating CRCs. Due to ethnicity and sex descriptors within the three vignettes, it cannot be ruled out with certainty whether extraneous variables influenced the outcomes.

This study found no significant differences of JARR total scores between male and female adolescents, but did find a difference between the ethnic categories of White/Caucasian

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and Hispanic, though the calculated effect size was small. These findings support the

assumption that the JARR might be applicable to both sexes without modification. With regard

to ethnical category, the low effect size indicates that it is unlikely that the JARR would require

modification based on the client's ethnic status. Still though, this finding points to potential for

rater bias, and the need for researchers to be sensitive to multicultural factors in the development

of assessment instruments.

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Juvenile Addiction Risk Rating (JARR)

Name: _____ ☐ Male ☐ Female Race: _____

City/County/State: _____ Grade: _____ Birth Date: ____ / ____ / _____

SS# or ID#: _____ Referred By: _____

Directions:
Rate the youth on the following 10 risk factors using data obtained from clinical records and collateral interviews. To obtain an overall risk-rating, compare the total scores from both pages using the risk scoring matrix.

History of Substance Abuse Services:
- no referral history for SA assessment (non-current), drug education, support groups, and/or SA counseling............0
- attended an assessment, drug education, and/or support group meeting in the past, but no formal SA counseling......1
- no more than one series of non-intensive, outpatient substance-related counseling; or multiple drug ed referrals......2
- multiple series' of SA outpatient counseling; or drug court; or residential rehab or group home placement history....3

Mental Health History:
- never diagnosed or treated for a mental health disorder; or no indication of bullying and/or trauma in history..........0
- history of school guidance; or outpatient mental health counseling (pre-teen only), but no day-treatment history......1
- outpatient treatment in adolescence; or day/acute/residential care pre-teen; or a significant trauma/bullying history..2
- day/acute/residential mental health treatment during adolescence; or at least one suicide attempt in history............3

Family History of Addiction:
- no blood relatives or cohabiting step-relatives suspected of or ever treated for a substance-related problem............0
- blood relative (non-parent or non-sibling) suspected of or ever treated for a substance-related problem..................1
- at least one blood or step-sibling, and/or step-parent, suspected of or ever treated for a substance-related problem...2
- at least one biological parent suspected of or ever treated for a substance-related problem................................3

Strength of Family Relationships:
- no significant impairments; or conflicts, but not beyond what is developmentally or contextually expected............0
- strained relationships; or adjustment difficulties to changes in family unit; or ineffective parenting/limit-setting.......1
- has lived outside the home due to issues with the family unit; or lack of parental involvement; or over-indulgence....2
- history of abandonment, abuse/neglect, attachment issues, change in guardianship, foster care and/or adoption.......3

Peer Selection:
- very few close peers, if any, are suspected of or reportedly using substances...0
- has a mixed peer group, with more non-using friends than those suspected of or reportedly using substances..........1
- most of close peers are suspected of or reportedly using substances; or several peers with substance-related arrests..2
- most of close peers have substance-related arrests, are in SA treatment, and/or report being in recovery................3

Page 1 total score: _____

Notes:

School-Related Difficulties:
- no significant history of defiance, detentions and/or suspensions; or on pace to graduate due to compliance.............0
- truancy history; or authority problems; or detention/suspension history; or studying for or obtained GED.............1
- alternative school history; or retention issues in adolescence; or studying for GED with poor prognosis.................2
- home-bound history; or currently expelled; or dropped out; or little chance of successfully obtaining GED.............3

Aggression and Violence:
- no significant history of verbal/physical aggression or violence toward others...0
- history of verbal aggression toward peers, family, school personnel, and/or authority figures; no violence.............1
- history of physical aggression toward peers, family, school personnel and/or authority figures............................2
- history of gang involvement; or animal cruelty; or fire-setting; or battery/assault charge; or sexual assault arrest.....3

Juvenile Delinquency:
- has never been arrested or had significant contact with police for delinquent behavior....................................0
- court diversion or supervision for truancy/family problems; or a delinquency arrest, but no charges ever filed.........1
- adjudication history for criminal charges; or multiple delinquency arrests or police contact, but no charges filed.....2
- multiple detention stays or probation revocations; or pending state commitment; or state incarceration.................3

Attitude toward Substance Use:
- uses sparingly, if at all; or believes use damages one's family or reputation; or believes they are too risky.............0
- believes use is fine as long as one maintains control; or is "playing the game" to discharge or avoid conflict............1
- considers self in recovery; or admits struggle with cravings or peer pressure; or verbalizes relapse justification........2
- defends the right to use; or uses despite threat of sanctions; or uses despite consequence; or no intention to change...3

Extent of Substance Use:
- limited to experimental nicotine, alcohol or marijuana use history; no abuse, withdrawal, or consequences noted....0
- repeated use of alcohol, nicotine or marijuana in history; or experimental medication misuse; or binge drinking.......1
- heavy alcohol, nicotine or marijuana use; or repeated medication misuse; or any use of substances noted below........2
- repeated use of severely addictive and/or dangerous substances (opioids, meth, cocaine, sedatives, inhalants, etc...)..3

Page 2 total: _____	
Page 1 total: _____	
JARR Total Score: _____	

Notes:

JARR Total Score		
0 – 8	9 – 18	19 – 30
Low Risk	Moderate Risk	High Risk

Examiner: _____ Date: _____ Agency: _____

Do you choose to override results? ☐ Yes ☐ No   If so, why? _____

_____

Vignette 1

Anthony is a 16-year-old, Caucasian male returning to substance abuse counseling after spending two-weeks in acute care at the local psychiatric hospital for suicidal thoughts. He was referred for acute care by his psychiatrist, whom has been treating him for depression for nearly two-years. Anthony started substance abuse counseling last month after failing a drug screen for opioids as provided by his FINS officer (Family In Need of Service), as filed by his mother with the juvenile court, after Anthony ran away for six days following a domestic altercation between her and Anthony's step-father. She reports that the step-father is an alcoholic, and gets violent. They have been married since Anthony was four-years-old. Anthony has never met his biological father, and the mother says he was a "one-night stand" and "couldn't find him if [she] tried." The mother says Anthony "hates" his step-father, and Anthony admits running away because, "I can't stand all the fighting. I'm sick of it." Anthony currently attends the 10th grade at a local day treatment program. He was referred there last year by the public high school due to lack of motivation toward his education, and truancy. He also got into several physical altercations with peers, and threw a desk at a teacher while being confronted about failing a test. Despite the violence, no charges were or have ever been filed on him, as those involved believe his behavior is due to family conflict and depression, and not anti-social traits. Anthony agrees, and admits that this is why he started using drugs last year, which includes Benzodiazepines, alcohol, and marijuana to cope, but says he usually just sticks with prescription pain killers, acknowledging that he prefers Hydrocodone the most, and uses it whenever he can get his hands on them. He says that he usually can "score" from his friends, since most of them use drugs since they are not on probation or FINS, and when that happens he will use daily "to numb out from all the bullshit." Anthony admits that he is "hooked" on the medication, and says, "Counseling is a joke. So I have had to find something else that works. It doesn't. That's why I thought about killing myself."

Vignette 2

Mary is a 17-year-old, Caucasian female referred by her biological parents for a substance abuse screening after they found some Adderall in her room. This is her first time to be seen by a counselor, other than some guidance from her school counselor on how to handle the stress of balancing work, athletics and AP courses. The family denies a history of mental health issues, and are unsure of how to conceptualize Mary's use of Adderall since this is the first time either parent has been faced with substance use since there is no family history of substance abuse other than a distant cousin on the mother's side. They indicate that Mary is a "good kid," and popular, and most of her friends are planning on joining her at the state university next year. The mother says, "I don't understand why she would do this. This could ruin her life." Mary has never been arrested, and has no history of violence. The parents chose to seek professional help to avoid court involvement. Mary admits that she was given the medication from a close peer after Mary informed him that she was struggling with staying focused and organized because of all the stress and business of her life. She says she tried it twice, but only on days when she had to stay up late studying. She appears very embarrassed, and denies any desire to continue using the medication without a prescription. Mary denies using any other substance, other than drinking two or three beers at a party, but she says, "Those kind of parties are rare for me."

Vignette 3

John is a 14-year-old, Hispanic male referred by his probation officer for a substance abuse screening. He is on probation for 3rd degree Battery for getting into a physical altercation with a peer at his high school. John is in the 9th grade, enrolled in regular education, but he does get some detentions for behavioral issues. Namely, he argues with authority, defies the rules, is often truant, and gets upset easily when redirected. He just started receiving school-based therapy from a local community mental health social worker approximately one-month-ago, and is diagnosed with Oppositional Defiant Disorder. John has no other psychiatric issues and does not take medication, and has never been hospitalized for mental health needs. This is John's first time to be assessed for substance abuse problems, and he is joined for the assessment by his single-mother. This is her second time here, as John's older brother was screened and treated for Cannabis Abuse two-years-ago. John also uses marijuana, beginning four months ago, and his smoking went from weekend use to about four to five times weekly. His mother says his attitude, motivation and school behaviors became worse as a result. Other than what appears to be normal adolescent defiance, the mother denies that John's use has affected the home environment much, noting that the two of them have a good relationship, and that he gets along with his brother well. He also minds his father during visitation every other weekend. John says, "I like to smoke. I'm not addicted. I just failed a drug screen at court. I've already quit. I have to. I'll be fine. I'm not like my friends that smoke every day and can't go without it. I can see how it messes them up. I'm not like them. I don't want to be, and I don't want to get in trouble with my probation officer." John says the tough part will be avoiding these friends, because they smoke around him. Most of them are on probation too, so he is ordered to stay away. He denies having many friends that don't smoke.

UNIVERSITY OF ARKANSAS

January 19, 2016

MEMORANDUM

TO:	Paul Hickerson Brent T. Williams
FROM:	Ro Windwalker IRB Coordinator
RE:	New Protocol Approval
IRB Protocol #:	15-12-446
Protocol Title:	*The Juvenile Addiction Risk Rating for Use in Vocational Rehabilitation*
Review Type:	☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB
Approved Project Period:	Start Date: 01/19/2016 Expiration Date: 01/18/2017

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (https://vpred.uark.edu/units/rscp/index.php). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 1,019 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.

109 MLKG • 1 University of Arkansas • Fayetteville, AR 72701-1201 • (479) 575-2208 • Fax (479) 575-6527 • Email irb@uark.edu
The University of Arkansas is an equal opportunity/affirmative action institution.

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Informed Consent Agreement

Please read this consent agreement carefully before you decide to participate in the study.

Purpose of the research study:

The purpose of this study is to investigate whether the Juvenile Addiction Risk Rating (JARR, Powell & Newgent, 2015), an instrument designed to assist in the assessment of risk for adolescent substance use disorder (SUD), might be useful in the field of vocational rehabilitation. To that endeavor, this study will examine whether certified rehabilitation counselors (CRCs) can accurately score the JARR based on information provided within three vignettes.

What you will do in the study:

Three vignettes containing information about fictional juvenile clients will be presented. After reading each vignette, you will complete a Juvenile Addiction Risk Rating (JARR), a two page 10-item instrument, based on the information you have read. You will not be given instructions on how to complete JARR.

Time required:

The task will require approximately 15 to 20 minutes to finish.

Risks:

During this study you will not be exposed to more than minimal risk. This means you will not be at risk of harm more so that those ordinarily encountered in ordinary life, or typically encountered during the performance of psychological exams or tests. In this case, you will be assessing the risk level for SUD of fictional adolescent clients depicted within three distinct vignettes representing low, moderate, and high levels of risk. The content of the vignettes might be disturbing to individuals sensitive to descriptions of juvenile distress (e.g., descriptions of drug use and psychiatric disorder symptomology). Remember, you may withdraw from the study at any time, for any reason, without penalty.

Benefits:

There are no direct benefits to you for participating in this research study. However, this study may help us to better understand whether the JARR might be a user-friendly, accurate, supplementary instrument in the vocational rehabilitation field by determining whether CRCs are able to accurately complete it without specific instructions in how to do so.

Confidentiality:

All information collected will be kept confidential to the extent allowed by law and University policy. Your information will be assigned a code number. The list connecting your name to this code will be kept in a locked file and/or encrypted electronic format. When the study is completed and the data have been analyzed, this list will be destroyed. Your name will not be used in any report.

Voluntary participation:

Your participation in the study is completely voluntary

Right to withdraw from the study:

You have the right to withdraw from the study at any time without penalty.

How to withdraw from the study:

If you want to withdraw from this study prior to completion of the task, contact the primary investigator via email stating that you wish to withdraw. If you have completed the task, and wish for the information you have submitted to be excluded from the study, contact the primary investigator via email stating that you wish for the data you contributed to not be included in the study.

Payment:

You will receive no payment for participating in the study.

If you have questions about the study contact:

Paul Hickerson (Primary Investigator)
Department of Rehabilitation, Human Resources, and Communication Disorders
Room 106, Graduate Education Building, University of Arkansas, Fayetteville, AR 72701
(479) 575-2982
phickerson@atu.edu

Dr. Brent T. Williams (Faculty Advisor)
Department of Rehabilitation, Human Resources, and Communication Disorders
Room 154, Graduate Education Building, University of Arkansas, Fayetteville, AR 72701.
(479) 575-8696
btwilli@uark.edu

If you have questions about your rights in the study, contact:

Ro Windwalker (Compliance Coordinator)
Institutional Review Board
MLKG109
University of Arkansas
Fayetteville, AR 72701
(479) 575-2208
Email: iwindwal@uark.edu