DEFICITS IN MIRANDA COMPREHENSION AND REASONING: THE EFFECTS OF SUBSTANCE USE AND ATTENTION DEFICITS

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Each year, an estimated 318,000 defendants who do not comprehend the Miranda warnings waive their rights and provide incriminating evidence without the protection of counsel (Rogers, 2008), which make Miranda-related competencies one of the most pervasive pretrial issues. A wide range of issues could potentially affect an individual’s capacity to provide a knowing and intelligent waiver. Previous Miranda research has focused narrowly on the effects of cognitive and developmental factors. The current study added to the Miranda literature by examining the impact of two highly prevalent conditions found in correctional populations, attention deficits and substance abuse.

Adult defendants in custody ($N = 118$) were evaluated within 36 hours of arrest in order to assess both chronic psychological disorders and situational variables. Results indicate that attention deficits have a significant impact on defendants’ ability to provide a knowing Miranda waiver, whereas substance use profoundly affected their reasoning about Miranda waiver decisions. This study represents the first systematic investigation of the effect of transient mental states on Miranda-related abilities with criminal defendants. Important implications for forensic practice are addressed.
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CHAPTER 1
INTRODUCTION

Throughout the last century, the courts have raised doubts regarding the validity of some criminal defendants’ confessions. The courts gradually began to provide more specific guidelines that ensure the constitutional rights of criminal defendants in the United States. In Brown v. Mississippi (1936), the Court ruled that convictions based solely on confessions brought about through “brutality and violence” of police officers represented a violation of the due process clause of the 14th Amendment. This concept of physical coercion was extended to include excessive psychological pressures imposed by police in Spano v. New York (1959). In addition to banning coercive tactics used by law enforcement to obtain confessions, the Supreme Court later ruled that defendants should have a right to consult with an attorney before a custodial interrogation (Escabedo v. Illinois, 1964).

The constitutional rights of criminal defendants were further enshrined in the landmark decision of Miranda v. Arizona (1966). Based on the Fifth Amendment protection against self-incrimination, the Court affirmed defendants’ constitutional rights to silence and to legal counsel. Absent other “other effective measure” (Miranda v. Arizona, p. 467), police officers are required to administer the Miranda warnings prior to the questioning of a suspect that is in police custody (Oberlander, Goldstein, & Goldstein, 2003). It was determined that any statement made during a custodial police interrogation
would be presumed involuntary and inadmissible unless the suspect was informed of the following four components: (a) the right to remain silent; (b) that any statements made by the suspect may be used as evidence against the suspect in court; (c) the right to consult with an attorney and have the attorney present during the questioning; and (d) the right to a court-appointed attorney if the suspect cannot afford one. Despite the specification in *Miranda* that “opportunity to exercise these rights must be afforded to him throughout the interrogation (p. 479),” only 80% of the warnings throughout the United States include a fifth component stating a suspect’s continuing rights to silence and to counsel (Rogers, Hazelwood, Sewell, Harrison, & Shuman, 2007). The absence of such information could be detrimental to suspects who assume they must continue answering questions once they have waived their constitutional rights.

*Miranda* required that the content of warnings be stated in “clear and unequivocal language” (p. 468). However, it allowed individual jurisdictions to establish their own specific wording (Oberlander et al., 2003). As a result, the wording of Miranda warnings is unstandardized and varies dramatically both within and across jurisdictions. Helms (2003) found at least 31 different versions of Miranda warnings when used by different state police departments. At the county level, Greenfield, Dougherty, Jackson, Podboy, and Zimmermann (2001) found that 16 different Miranda versions were used in New Jersey alone. Data from a national survey of 945 jurisdictions yielded more than 800 distinct Miranda versions that are currently being used throughout the United States (Rogers, Harrison, Shuman, Sewell, & Hazelwood, 2007; Rogers, Hazelwood, et al.,
The differences between Miranda versions range from minor variations in wording to more substantive discrepancies.

With no established wording for the Miranda warnings, the content has also been found to be markedly inconsistent between warnings (Rogers, Harrison, Shuman, et al., 2007; Rogers, Hazelwood, et al., 2007). For example, on the issue of when access to an attorney would be granted, almost half of the warnings specified only “during questioning,” omitting the *Miranda* requirement of, “If, however, he indicates in any manner and at any stage of the process that he wishes to consult with an attorney before speaking there can be no questioning (p. 445).” As a second example, less than 40% of the warnings explicitly stated that indigent legal services are available at no cost to the suspect. Such incomplete information has the potential to misinform criminal suspects regarding the affordability of defense counsel.

**Legislative Challenges to *Miranda***

The United States Congress attempted to challenge *Miranda* in 1968 by passing a law that would permit a case-by-case determination of the voluntary nature of a confession (18 U.S.C. 3501). Although elements of *Miranda* were still considered in making these determinations, the Miranda warning was no longer required to be administered prior to interrogation. Essentially, this law suggested that voluntary statements made by suspects could be used against them even if they had not been administered the Miranda warnings. The statute, 18 U.S.C. 3501, was later used as a basis for challenging *Miranda* in *Dickerson v. U.S.* (2000). At the appellate level, Judge Karen Williams wrote the opinion that *Miranda* was a rule of law, not a constitutional
requirement (Oberlander et al., 2003). However, the U.S. Supreme Court upheld *Miranda* in *Dickerson* based on the principle of *stare decisis*, which let stand an earlier precedent. The majority concluded, “*Miranda*, being a constitutional decision of this court, may not be in effect overruled by an act of Congress, and we decline to overrule *Miranda* ourselves. We therefore hold that *Miranda* and its progeny in this Court govern the admissibility of statements made during custodial interrogation in both state and federal courts” (*Dickerson v. U.S.*, 2000, p. 432).

Following the Supreme Court’s decision, Miranda warnings are required to be administered to defendants in order for a statement to be allowed into evidence. It is essential that defendants comprehend and appreciate their rights before given an opportunity to waive these rights and respond to questioning. Psychologists are often asked to evaluate the validity of Miranda waivers.

**Waiver of Miranda Rights**

Statements provided without an accurate understanding of the Miranda warnings can have significant ramifications. Police investigators estimated that an average of 68% of suspects provide at least partial confessions during custodial interrogations (Kassin et al., 2007). However, this percentage drops dramatically when the suspect is represented by legal counsel (Rogers & Shuman, 2005). The introduction of a defendant’s confession at trial is the “single most influential factor” in a subsequent guilty verdict (Oberlander et al., 2003, p. 335). On a similar point, Wrightsman and Kassin (1993) reported that confessions were the primary basis for criminal convictions in approximately 50% of criminal cases. Based on these findings, defendants that do not adequately understand or
appreciate their rights are seriously disadvantaged and are likely to provide incriminating statements to the police without seeking legal counsel. According to Rogers and Shuman, Miranda waivers by impaired defendants have the potential to exceed the numbers for all other pretrial issues combined.

Supreme Court decisions ruled that Miranda waivers are only considered valid if they are made knowingly, intelligently, and voluntarily (Miranda v. Arizona, 1966; Godinez v. Moran, 1993; Iowa v. Tovar, 2004). While the Court established that all three requirements must be satisfied to conclude that a waiver is valid (Edwards v. Arizona, 1981), the Court was not clear regarding the separate meaning of each construct. These three constructs will be discussed in detail below.

Knowing Prong

Grisso (2003) defined a knowing waiver as the “sum of suspects’ abilities to understand plus the manner in which they are informed” (p. 151). Based on this description, two factors must be examined: (a) the defendant’s ability to know or understand what each of the Miranda components means and (b) the manner in which the warnings are given (Frumkin, 2000). The first factor is comprised of the suspect’s lack of understanding of both the vocabulary and the meaning of Miranda statements (Rogers & Shuman, 2005). Cognitive deficits, such as mental retardation, dementia, or low verbal abilities, may affect a defendant’s ability to knowingly waive their rights.

The manner in which the Miranda rights are administered can also have a significant impact on a suspect’s appreciation of his or her rights. A clear, thorough explanation is more likely to be understood than a hasty, incomplete warning (Grisso,
The intelligent prong of a Miranda waiver addresses a rational decision-making capacity and reasoning ability. Grisso (2003) described this prong as the ability to “grasp the significance” of the Miranda warnings and apply the warnings to their own situation. In Iowa v. Tovar (2004, p. 1387), the Court affirmed that an intelligent waiver requires “the defendant knows what he is doing and his choice is made with eyes open.” According to Rogers and Shuman (2005), intelligent waivers require suspects to demonstrate three cognitive abilities: (a) identifying their alternatives; (b) understanding the consequences of these alternatives; and (c) applying reasoning to their decision. Severe psychotic symptoms, such as paranoid delusions, may affect a suspect’s ability to make an intelligent waiver by markedly impairing the decisional process (Rogers & Shuman).

Voluntary Prong

A voluntary Miranda waiver has been defined as a waiver decision that is “a consequence of the suspect’s will, rather than a product of coercion” (Grisso, 2003, p. 153). Courts have tended to focus on police action rather than the defendant’s perception of coercion when considering the voluntariness of a confession. Following Colorado v. Connelly (1986), a Miranda waiver is considered voluntary unless it is the result of
coercive activity by law enforcement, markedly limiting defendants’ grounds for asserting that a waiver was involuntary (Rogers & Shuman, 2005). Based on this ruling, even significant mental impairment, such as delusions or hallucinations, will not automatically render a confession involuntary. Proof that the police took advantage of the suspect’s condition or a causal relationship between the police conduct and the confession must be established to determine a Miranda waiver is involuntary (Frumkin, 2000; Melton et al., 2007). However, psychological factors, such as low intelligence, mental disorder, and suggestibility, may increase vulnerability to police interrogation tactics (Frumkin, 2000), and therefore, courts must still consider whether police actions were coercive in light of these factors (Grisso, 2003).

**Totality of Circumstances**

The law provides two approaches in determining whether a defendant’s waiver of his or her Miranda rights is valid: the *per se* approach and the *totality of circumstances* approach (Grisso, 2003). *Per se* rules automatically invalidate a Miranda waiver in every case in which a certain fact or circumstance is present. In contrast, the *totality of circumstances* approach is a discretionary determination based on a consideration of all relevant characteristics in a particular case. Currently, the courts utilize the *totality of circumstances* approach (*Fare v. Michael C.*, 1979; *Miranda v. Arizona*, 1966), which prohibits either validating or invalidating a waiver based solely on a single factor and requires an examination of all of the circumstances surrounding the Miranda waiver and interrogation (Frumkin, 2000; Oberlander et al., 2003). *Coyote v. U.S.* (1967) stated that the age, background, and intelligence of the individual being interrogated should be
considered when determining the capacity of suspects to waive Miranda rights. Other factors that need to be considered are police procedures during the interrogation and the defendant’s mental state (Grisso, 2003; Gudjonsson, 2003). Therefore, relevant cognitive, psychological, and situational variables that are present at the time of arrest and interrogation must be taken into account when psychologists conduct evaluations regarding the validity of Miranda waivers.

Evaluation of Miranda-Related Capacities

Grisso (2003) identified three areas of functional capacities that should be addressed when determining a suspect’s competence to waive their Miranda rights. The first capacity is an understanding of the Miranda warnings, which addresses the knowing prong of a valid Miranda waiver. This capacity includes the suspect’s comprehension of specific words and phrases used in the Miranda warnings. The second capacity, perceptions of the intended functions of the Miranda rights, contains components of both the knowing and intelligent prongs of Miranda competence. It consists of three content areas: (a) an accurate perception of the adversarial nature of interrogation, (b) an understanding that the attorney is an advocate, and (c) an accurate appreciation of the constitutional protection from self-incrimination. The third functional capacity, which addresses the capacity to reason about the probable outcomes of waiver decisions, addresses the intelligent requirement of Miranda waivers. It requires the ability to accurately process information and rationally weigh the consequences of their decisions.

Forensic mental health professionals are often called to conduct evaluations of the validity of Miranda waivers. Such assessments can be difficult and complex due to the
numerous challenges the evaluator faces. First, specific guidelines for conducting Miranda waiver evaluations have only recently been addressed in published forensic resources (Frumkin, 2000; Gudjonsson, 2003; Rogers & Shuman, 2005). Moreover, forensic assessments regarding the validity of Miranda waivers can be challenging due to their retrospective nature and the lack of well-validated specialized measures (Rogers & Shuman, 2005).

**Measurement of Miranda Abilities**

**Grisso’s Miranda Instruments**

Grisso (1998) developed four specialized measures, known as Instruments for Assessing Understanding and Appreciation of Miranda Rights, for evaluating the waiver of Miranda rights, including: Comprehension of Miranda Rights (CMR), Comprehension of Miranda Rights – Recognition (CMR-R), Comprehension of Miranda Vocabulary (CMV), and Function of Rights in Interrogation (FRI). Three of the instruments address the knowing prong of a valid Miranda waiver. Specifically, the CMR assesses the defendant’s understanding of the Miranda warnings by asking him or her to paraphrase each of four Miranda statements, and the CMR-R involves the defendant’s ability to recognize elements of the warnings from various interpretations of the Miranda statements. The CMV measures comprehension of specific wording by asking the defendant to define six words that appear in the Miranda warning on which Grisso’s instruments were based. The final instrument, the FRI, addresses the intelligent requirement of a Miranda waiver by measuring the defendant’s ability to “grasp the significance” of the Miranda rights in an interrogation setting (Grisso). It uses
hypothetical police interrogation vignettes to assess the defendant’s understanding of the function of rights on three subscales: Nature of Interrogation, Right to Counsel, and Right to Silence. Although Grisso’s instruments assess the first and second functional capacities described above, they do not provide a method of evaluating the third capacity, which involves the defendant’s ability to reason about their Miranda decisions.

Rogers, Jordan, and Harrison (2004) identified several issues with Grisso’s (1998) Miranda measures. First, because they were originally developed and normed for use with juvenile populations, they lack sufficient reliability and validity to be considered psychometrically sound instruments for adult populations. Moreover, with the exception of the FRI, the measures were designed to evaluate the Miranda warning used in St. Louis County during the 1970s. Given the wide array of language and complexity used in Miranda warnings (Rogers, Harrison, Shuman, et al., 2007; Rogers, Hazelwood, et al., 2007), the content validity of the St. Louis-based measures is severely limited, and their utility is lacking for jurisdictions that use substantially different wording and content. On a related note, many jurisdictions include a fifth component in the Miranda warning that affirms the ability to reassert the rights at anytime (Oberlander & Goldstein, 2001); however, Grisso’s measures do not evaluate this component. Despite these limitations, an estimated 44% of those conducting Miranda evaluations had used Grisso’s Miranda instruments (Ryba, Brodsky, & Shlosberg, 2007).

Goldstein, Condie, Kalbeitzer, Osman, and Geier (2003) introduced and described a revised version of Grisso’s measures, entitled the Miranda Rights Comprehension Instruments – II (MRCI-II). The goal in revising these measures was to increase their
applicability to other jurisdictions and improve the normative data. A fifth test, Perceptions of Coercion in Holding and Interrogation Procedures, was added to assess the likelihood that a defendant may offer a false confession under various circumstances.

Recently, initial findings indicate that the MRCI-II has adequate psychometric properties (Kalbeitzer, Goldstein, Romaine, Mesiari, & Zelle, 2008). However, the research thus far has focused on juvenile offenders.

*Gudjonsson Scales*

Grisso’s (1998) instruments focus exclusively on the knowing and intelligent prongs of a Miranda waiver, with no measure of the voluntary prong. Several prominent forensic psychologists (Brodsky & Bennett, 2005; Frumkin, 2000; Oberlander et al., 2003) have indicated that suggestibility is relevant to making voluntary Miranda decisions and should be considered in Miranda evaluations. These researchers have recommended the use of the Gudjonsson Suggestibility Scale (GSS; Gudjonsson, 1997) in Miranda consultations to identify individuals that are susceptible to providing inaccurate accounts during interrogative situations. However, other Miranda experts have found insufficient conceptual and empirical bases for including suggestibility in evaluations of Miranda abilities (Grisso, 2003; Rogers, Harrison, Rogstad, LaFortune, & Hazelwood, in press). Grisso determined that suggestibility was relevant to false confessions but not germane to Miranda capacities. Moreover, a recent study (Rogers, Harrison, Rogstad, et al.) found that suggestibility played no direct role in Miranda comprehension, reasoning, or detainees’ perceptions of police coercion.
Apart from the divergent perspectives regarding the clinical utility of suggestibility in forensic practice, assessment of suggestibility via the GSS may be problematic due to questionable ecological validity. The GSS was developed and normed in Iceland and Britain, and has not been widely accessible or used by forensic practitioners in the United States (Frumkin, 2000). Recent research in the United States (Rogers, Harrison, Rogstad, et al., in press) revealed the inapplicability of the British norms to American jurisdictions. Moreover, the GSS subjects the defendant to leading questions regarding a fictitious case that is completely irrelevant to the defendant’s actual case and potential consequences (Rogers & Shuman, 2005).

Beyond suggestibility, Gudjonsson (2003) indicated that compliance may also affect defendants’ decisions regarding whether to cooperate with police officers and provide incriminating information. Accordingly, Frumkin (2000) argued for the inclusion of the Gudjonsson Compliance Scale (GCS; Gudjonsson, 1989), a self-report measure that evaluates the degree to which individuals give in to external pressure, in Miranda evaluations. Rogers, Harrison, Rogstad, et al. (in press) found that defendants with high compliance had significantly lower Miranda comprehension and Miranda reasoning ability than their counterparts with low compliance. Although consideration of compliance may be useful in Miranda consultations, questions on the GCS are transparent and “can be faked if persons are motivated to do so” (Gudjonsson, 1997, p. 30). Therefore, alternative assessment methods may be necessary when feigning is suspected.
Individual Characteristics Affecting Miranda-Related Competencies

As previously discussed, courts utilize a *totality of circumstances* approach when determining the validity of a Miranda waiver. A defendant’s understanding and appreciation of his or her constitutional rights and the consequences of waiving these rights can be impaired by either cognitive deficits or symptoms of a mental disorder (Rogers & Shuman, 2005). Moreover, the demands of the situation surrounding the police interrogation can also have a significant impact on the defendant’s capacity to understand and appreciate his or her rights (Grisso, 2003; Oberlander et al., 2003). However, there are no absolute cut scores in terms of age, stressful circumstances, or intellectual or psychological functioning that automatically renders a person incompetent to waive his or her rights (Frumkin, 2000). Courts typically consider the following defendant characteristics when examining the *totality of circumstances*: level of education, IQ, language ability, literacy, age, mental illness, and experience with the police and the court system (Oberlander et al., 2003). Courts have also considered situational states of the suspect at the time of the waiver, including intoxication, fatigue, and physical illness (Grisso, 2003),

*Psychological Vulnerabilities Model*

Gudjonsson (2003) provided the psychological vulnerabilities model as a conceptual framework to aid in conducting a comprehensive assessment related to the voluntariness and reliability of a Miranda waiver and subsequent confession. This model addresses the “psychological characteristics or mental states that render a suspect prone, in certain circumstances, to providing information which is inaccurate, unreliable (or
invalid), or misleading (p. 316).” It is categorized into four domains discussed in detail below: cognitive functioning, personality characteristics, mental disorders, and abnormal mental states.

**Cognitive Functioning**

The first domain addresses the intellectual and verbal abilities of the defendant (Gudjonsson, 2003). Limited cognitive functioning, such as that found in individuals with mental retardation or learning disabilities, can impact the defendant’s capacity to understand the rights and appreciate the implications of his or her decisions and statements. Courts have historically acknowledged the potential invalidity of waivers and confessions from such individuals (*Ford v. State*, 1897; *U.S. ex rel. Simon v. Maroney*, 1964). However, it cannot be assumed that courts will find a waiver invalid solely based on an individual’s level of cognitive functioning (Oberlander et al., 2003). For example, in *People v. Williams* (1984), the New York Court of Appeals ruled that the waiver of a mentally retarded and “organically impaired” individual was valid because the police paraphrased and explained the Miranda warning to the defendant. Therefore, both a defendant’s level of intelligence and verbal skills should be evaluated when determining competence to waive Miranda rights.

*Intelligence.* Research has shown that individuals with mental retardation are more likely to offer a confession, whether it be true or false, than individuals with average abilities (Perske, 2000). The impact of intellectual functioning on Miranda comprehension has been researched by examining the performance of mentally retarded individuals on Grisso’s (1998) Miranda measures. In his initial work, Grisso (1981)
found that intelligence evidenced significant negative correlations with Miranda comprehension across both adult and juvenile samples. When comparing mentally retarded probationers to non-mentally retarded probationers, Everington and Fulero (1999) found that those with mental retardation scored significantly lower on all three of Grisso’s measures than their non-mentally retarded counterparts. In examining understanding of the Miranda warning, 67% of the mentally retarded probationers did not understand at least one of four Miranda rights, as compared to only 17% of the control group. Both studies indicate that intellectual deficits have an adverse effect on Miranda comprehension.

Clare and Gudjonsson (1995) compared the Miranda reasoning ability of mentally retarded and non-mentally retarded individuals not involved in the criminal justice system. Only 52% of mentally retarded individuals believed that legal advice would be needed at the beginning of a police interview versus 90% of individuals with average intelligence. Moreover, persons with mental retardation believed they could retract any statement made to police and that it would not consequently be used as evidence of guilt in court. These findings have substantial implications for the ability of mentally-retarded individuals to appreciate the purpose of the Miranda rights and to effectively utilize that information in making Miranda-related decisions.

Miranda research has controlled for the predictive ability of other variables, such as age and criminal justice experience, that may account for the strong relationship found between intelligence and Miranda comprehension. Grisso (1981) statistically controlled for the effects of age and experience with the criminal justice system, and reported that
“differences among adults in understanding of Miranda warnings are related primarily to differences among them in general intellectual functioning” (p. 101). Similarly, Bishop (1990) found that intelligence scores were the best single predictor of Miranda competency, accounting for approximately 71% of the variance in total Miranda comprehension scores, eclipsing both adaptive behavior and age. When evaluating mentally retarded individuals with and without criminal justice experience, Fulero and Everington (1995) found that both samples scored substantially lower on all three of Grisso’s (1998) Miranda measures than Grisso’s (1981) adult and juvenile samples. Across studies, intelligence was the primary predictor of Miranda capacities and much more salient than prior exposure to Miranda warnings. Although it is often assumed that being Mirandized for prior arrests builds knowledge of Miranda, prior exposure appears to be unrelated to accurate understanding.

**Verbal abilities.** Miranda warnings are administered by either asking the defendant to read the warning or orally presenting the warning to the defendant. Therefore, both reading and listening comprehension skills are critical components of a defendant’s capacity to understand the Miranda rights. Verbal abilities of defendants are especially relevant to Miranda comprehension when considering most adult offenders have not completed high school (Harlow, 2003). Moreover, offenders typically demonstrate reading skills an average of four years below their academic level (Klinge & Dorsey, 1993). In this regard, the National Adult Literacy Survey (Haigler, Harlow, O’Connor, & Campbell, 1994) investigated the basic achievement levels for offender populations. In evaluating the literacy skills of 1,150 inmates from 80 federal and state
correctional facilities, they found that approximately 70% of inmates functioned at or below the 6th grade level.

Defendants’ marked deficits in literacy skills become even more problematic with respect to Miranda comprehension when the vast array of Miranda warnings is taken into account. In a survey of more than 800 distinct Miranda versions (Rogers, Harrison, Shuman, et al., 2007; Rogers, Hazelwood, et al., 2007), required reading levels for adequate comprehension ranged dramatically from grade 2.8 to postgraduate education. Moreover, the warnings often contained words that required at least a 10th grade education to accurately understand the meaning. Rogers and colleagues (2007, p. 133) reported that “the odds are nearly 3:1 that suspects will need at least a 7th grade education to understand most of the material.” With 70% of criminal defendants having literacy skills at or below the 6th grade level (Haigler et al., 1994), it is obvious that Miranda warnings are not fully understood by most offenders.

The length of the Miranda warnings may present another challenge to offenders with poor verbal skills. The total length of Miranda warnings used across the United States ranges from 49 to 547 words (Rogers, Harrison, Shuman, et al., 2007; Rogers, Hazelwood, et al., 2007). Longer warnings likely prove to be difficult for defendants to recall and understand. Miller’s (1956) seminal work suggested that most persons can only consider 7±2 concepts. Taking into account the ability to chunk information, Rogers, Harrison, Shuman, et al. estimated that most individuals are likely unable to adequately process more than 75 words when presented orally. Given that the average warning
contains 95 words (Rogers, Hazelwood, et al.), it can be concluded that most defendants cannot adequately process oral Miranda advisements.

Assumptions can be made regarding the effects of low literacy levels on understanding of Miranda rights; however, this relationship has been virtually ignored in the literature. As an exception, Osman (2005) examined the relationship between academic achievement and Miranda comprehension in a study of male adolescents in the juvenile justice system using Grisso’s (1998) Miranda measures and the Wechsler Individual Achievement Test, Second Edition (WIAT-II; Psychological Corporation, 2002). Surprisingly, reading comprehension was not related to overall Miranda comprehension. However, listening comprehension and oral expression skills were significantly related to the adolescents’ abilities to paraphrase Miranda warnings and define Miranda vocabulary. Listening skills were also associated with the ability to apply the warnings to a hypothesized interrogation. These findings make sense given the nature of the tasks involved in Grisso’s instruments, which require little reading and place more emphasis on the capacity to listen to the examiner and verbally express a response.

Despite Osman’s (2005) findings, it is likely that reading skills are essential to Miranda comprehension when the defendant is required to read the warning, especially in jurisdictions using more complex warnings. On this point, Harrison (2007) found that reading comprehension was the only variable to significantly discriminate between participants with good and poor Miranda comprehension, as measured by the MSS (Rogers, 2005). Moreover, reading ability significantly predicted MSS scores when the warnings were written at the highest reading levels (i.e., grades 10 to 11.9 and ≥ 12).
Although limited research has been conducted regarding the effect of academic skills on Miranda-related capacities, these two initial studies indicate the potential importance of including these variables in a Miranda waiver evaluation.

**Personality Characteristics**

Gudjonsson (1990) asserts that the five most psychologically relevant factors when addressing the legal issues of “admissibility” and “reliability” of confessions are: intellectual skills, educational attainment, suggestibility, compliance and the ability to cope with pressure, and acquiescence. Accordingly, the second domain of Gudjonsson’s (2003) model addresses three personality traits that may be relevant when evaluating the voluntariness and reliability of confession statements: suggestibility, compliance, and acquiescence. These three characteristics will be described in detail below.

*Interrogative suggestibility.* Gudjonsson and Clark (1986, p. 84) defined interrogative suggestibility as “the extent to which, within a closed social interaction, people come to accept messages communicated during formal questioning, as the result of which their subsequent behavioral response is affected.” Gudjonsson (2003) later outlined five interrelated components of interrogative suggestibility: (a) a social interaction, (b) a questioning procedure, (c) a suggestive stimulus, (d) acceptance of the stimulus, and (e) a behavioral response. Simply stated, a defendant may become susceptible to misleading questions or false information presented during an interrogation. This susceptibility may result in the defendant accepting that information as accurate and giving in to the interrogator’s suggestions.
According to Gudjonsson and Clark (1986), three conditions must be present for suggestibility to occur: (a) uncertainty, (b) interpersonal trust, and (c) expectation of success. Uncertainty refers to a defendant not knowing the correct answer to a question, and therefore, accepting the interrogator’s suggestion or at least believing it to be plausible. In order for this acceptance to occur, the defendant must trust the interrogator, believing that the interrogator’s intentions are genuine and without trickery. However, uncertainty and trust are not sufficient on their own to make defendants yield to suggestions. In order for interrogative suggestibility to occur, defendants must also believe that they are expected to know the correct response and are required to give a definite answer. Gudjonsson and Clark (1986) posited that most people would be susceptible to suggestions under these three conditions.

Negative feedback from the interrogator can increase the likelihood of interrogative suggestibility (Gudjonsson, 2003). When such feedback is accepted, the defendant may experience increased anxiety and lowered self-esteem, which will further increase uncertainty. Strong emotional reactions may lead the defendant “to seek external cues rather than relying on their own judgment and internal frame of reference” (Gudjonsson, p. 351). When these conditions are present in an interrogation setting, defendants may demonstrate an increased likelihood to waive their Miranda rights and provide incriminating information without adequate reasoning regarding their decision. This could adversely impact the voluntary nature of a valid Miranda waver as described in Moran v. Burbine (1986): “First, the relinquishment of the right must have been
voluntary in the sense that it was the product of a *free and deliberate choice* rather than intimidation, coercion, or deception,” (emphasis added, p. 421).

Several prominent forensic psychologists have assumed a relationship between interrogative suggestibility and Miranda-related competencies (Brodsky & Bennett, 2005; Frumkin, 2000; Roesch, McLachlan, & Viljoen, 2008). It has been believed that Miranda waivers and subsequent confessions may be easier to elicit from defendants who are susceptible to suggestion by shifting their answers in response to negative feedback.

Three studies (Everington & Fulero, 1999; Redlich, Silverman, & Steiner, 2003; Rogers, Harrison, Rogstad, et al., 2008) have addressed the relationship between suggestibility and Miranda-related competencies. Everington and Fulero found significant correlations between Grisso’s (1998) measures of Miranda competency and measures of suggestibility for mentally retarded probationers. As expected, Miranda competencies demonstrated moderate inverse relationships to GSS Yield scores and Total Suggestibility scores; however, scores on the Miranda measures were only marginally related to GSS Shift scores. In a juvenile sample, Redlich and colleagues found that suggestibility was a significant predictor of Miranda competence when using Grisso’s Miranda measures and the GSS. A more recent study by Rogers and colleagues, utilizing the GSS and newly developed Miranda measures (Rogers, 2005; 2006a; 2006b), found that highly suggestible defendants do not appear to experience diminished abilities in Miranda comprehension and reasoning. The vast discrepancies across these studies may be attributable to many factors, including the use of different Miranda instruments. Moreover, the samples used in these studies varied dramatically. Both Everington and
Fulero (i.e., mentally-retarded probationers) and Redlich et al. (i.e., non-delinquent juveniles) utilized samples composed entirely of individuals that are less cognitively developed and more likely to demonstrate suggestibility. Conversely, the sample used by Rogers and colleagues demonstrated greater variability in terms of age, cognitive functioning, psychological impairment, and length of detention.

Compliance. Suggestibility is closely related to the construct known as compliance. According to Gudjonsson (2003), compliance is “the tendency of the individual to go along with propositions, requests, or instructions, for some immediate instrumental gain” (p. 370). Compliance differs from suggestibility in that the individual does not personally accept the suggestion; an individual can disagree with the request but still react in a compliant manner. Gudjonsson (1989, 1997, 2003) conceptualized compliance as consisting of two major components: (a) an eagerness to please and need to protect one’s self-esteem when around others, and (b) an avoidance of conflict and confrontation, particularly with authority figures. The construct is typically viewed as a personality trait of those individuals that have difficulty coping with pressure from others (Gudjonsson, 2003).

According to Gudjonsson (2003), some individuals are inclined to comply with requests and obey instructions that they would rather not do when interviewed by police. Therefore, compliant individuals may be more likely to accede to police pressure to waive their Miranda rights and provide confessions. Two recent studies have addressed the role of compliance in waiver of Miranda rights (Harrison, 2007; Rogers, Harrison, Rogstad, et al., 2008). Utilizing a sample of cognitively and/or severely psychologically
impaired defendants referred for competency restoration, Harrison found that compliance was not a significant predictor of Miranda-related knowledge or reasoning abilities. Rogers and colleagues found that high versus low compliance consistently produced a 10-percent difference in Miranda understanding in a diverse sample of criminal defendants, in which defendants with high compliance evidenced lower comprehension. Interestingly, highly compliant defendants in this study evidenced significantly greater levels of depression and anxiety than their low compliant counterparts. It appears that compliance may be a more relevant construct for less-impaired defendants experiencing milder Axis I symptomatology. In a more impaired sample, factors such as intelligence or psychosis may overshadow the influence of compliance on Miranda capacities.

Acquiescence. Individuals that respond to questions in an affirmative (yea-saying) manner irrespective of the question content are referred to as acquiescent (Gudjonsson, 2003). Acquiescence has been conceptualized as relating to both personality and cognitive factors. Similar to compliance, acquiescence has been described as a personality trait related to submissiveness and eagerness to please (Finlay & Lyons, 2001). However, the primary difference between the two constructs appears to be that acquiescent individuals reply to any inquiry in the affirmative and are not necessarily attempting to obey requests, as is the case in compliance. Gudjonsson (2003) described acquiescence as a response style, which occurs when uncertainty or doubt is present. Both acquiescence and suggestibility consist of responding in an affirmative manner when unsure of the answer. However, with regard to acquiescence, the questions are not
structured in a manner to suggest that affirmative answers are the wanted or expected response (Gudjonsson, 2003).

Both Gudjonsson (2003) and Rogers and Shuman (2005) stress the importance of addressing acquiescence in Miranda-related evaluations. An acquiescent individual may inadvertently waive their rights during a police interrogation and subsequently provide incriminating, possibly false evidence by responding to police questions in an affirmative manner. However, only two studies (Harrison, 2007; Rogers, Harrison, Rogstad, et al., 2008) have examined the specific relationship between acquiescence and Miranda-related competencies. Both studies found that acquiescence demonstrated virtually no relationship with the accuracy of Miranda understanding or reasoning.

Mental Disorders

Recent studies (see reviews by Grisso, 2003; Oberlander et al., 2003) tend to focus primarily on cognitive factors (e.g., mental retardation) and de-emphasize the role of mental disorders on Miranda-related competencies. However, Weinstein, Kim, Mack, Malvade, and Saraiya (2005) estimated the prevalence of mental disorders in correctional settings to range from 6 to 20%. Mental disorders, such as schizophrenia or depression, adversely affect perceptions, cognitions, emotions, judgment, and self-control (Gudjonsson, 2003). Deficits in these areas may result in the defendant providing erroneous information to the police or not fully appreciating the implications and consequences of their decisions (e.g., Miranda waivers).

Cooper (2005) examined Miranda understanding and appreciation in a sample of psychiatric inpatients using Grisso’s (1998) Miranda measures. Compared to Grisso’s
normative samples, psychiatric inpatients were more impaired than offender and nonoffender adults in their comprehension of Miranda components, ability to define Miranda-related vocabulary, and appreciation of the rights. Even when accounting for IQ, psychiatric symptoms were significantly predictive of impaired Miranda comprehension. Similarly, Rogers, Harrison, Hazelwood, and Sewell (2007), utilizing their own Miranda research scales, found that overall Axis I impairment played a significant role in both Miranda comprehension and reasoning ability. Specifically, mentally disordered defendants had widespread difficulties in understanding all but the simplest Miranda warnings, irrespective of their past experiences with the criminal justice system and averaging close to a high school education. Moreover, Axis I impairment predicted the defendants’ inability to generate nonpsychotic reasons related to exercising Miranda rights. Although defendants with mental disorders have been largely overlooked in Miranda research, these two studies both identified psychological impairment as a significant contributor to Miranda comprehension. Rogers and colleagues further demonstrated the negative effect of psychopathology on Miranda reasoning ability. These studies provide evidence that mental disorders should be considered in evaluations of Miranda competency.

Cooper (2005) and Rogers, Harrison, Hazelwood, et al. (2007) utilized samples of psychiatric inpatients that suffered from moderate to severe psychological impairment. The primary Axis I diagnoses found amongst these samples included psychotic disorders. However, research shows that the typical criminal defendant is unlikely to evidence such severe symptomatology, with less than 3% currently diagnosed with Schizophrenia.
(Teplin, 1994; Teplin, Abram, & McClelland, 1996). Neither of these studies addressed the effects of one of the more prevalent Axis I disorders in correctional populations, specifically attention deficit-hyperactivity disorder (ADHD).

**ADHD.** Attention deficit-hyperactivity disorder (ADHD) has historically been conceptualized as a childhood disorder. It is estimated that ADHD symptoms affect between 4% and 12% of all children (Wilens & Dodson, 2004). While ADHD is a highly prevalent condition in children, research has indicated that the primary symptoms of this disorder often do not remit in childhood. It has been estimated that 30% to 70% of children who are diagnosed with ADHD continue to manifest symptoms of the disorder in adulthood (Barkley, 1998; Bellak & Black, 1992). The U. S. National Comorbidity Survey Replication estimated the prevalence of adult ADHD to be at 4.4% (Kessler et al., 2006).

The cardinal symptoms of ADHD throughout the life span include hyperactivity, impulsivity, and inattentiveness (Barkley, 1998). Beyond these primary symptom clusters, research has shown that ADHD in adults is associated with a number of cognitive deficits. For example, individuals with ADHD demonstrate attention difficulties that exceed basic distractibility. Specifically, adults with ADHD display significant impairments in complex attention tasks and tasks requiring attention over a sustained period of time (see reviews by Schoechlin & Engel, 2005; Woods, Lovejoy, & Ball, 2002). Deficits in problem-solving tasks that involve planning and reasoning abilities have been reported across several studies (Schoechlin & Engel, 2005; Woods et al., 2002), as well as slowed information processing speed (Woods et al., 2002).
Adults with ADHD evidence particular difficulties with verbal skills. Research has consistently demonstrated that many individuals with ADHD perform poorly on verbal memory tasks, even though their general verbal intelligence is intact (Obolensky, 2006; Quinlan & Brown, 2003; Schoechlin & Engel, 2005; Woods et al., 2002). Beyond memory, Samuelsson, Lundberg, and Herkner (2004) found that adults with ADHD were significantly more impaired on reading comprehension tasks than adults without ADHD due to difficulty with analytic skills, attention to detail, inference, and reasoning. The results of these studies indicate that adults with ADHD may suffer from a range of significant cognitive deficits that may affect their daily functioning.

Research has indicated that childhood ADHD often leads to poor mental health outcomes for individuals continuing to meet the diagnosis in adulthood. Specifically, individuals that continue to manifest ADHD symptoms beyond childhood are at high risk for substance abuse and antisocial conduct (Manuzza, Klein, Bessler, Malloy, & LaPadula, 1993). Biederman and colleagues (1993) found that lifetime prevalence rates for substance use disorders among adults with ADHD was 52%, nearly double the rate for adults without ADHD (27%). Regarding the relationship between ADHD and antisocial conduct, Babinski, Hartsough, and Lambert (1999) conducted a longitudinal study and found that ADHD symptoms of hyperactivity-impulsivity in childhood predicted later arrests and self-reported crime in adult males, even for those without concomitant childhood conduct problems. Given the significant relationship between ADHD and criminal activity, it is likely that there is a high incidence of ADHD in correctional populations. On this point, Eyestone and Howell (1994) reported that 25.5%
of adult male prison inmates met both childhood and adulthood diagnostic criteria for ADHD. This prevalence rate is almost six times higher than the rate in the general adult population.

ADHD has been associated with substantive cognitive deficits and is highly prevalent among adult male prisoners. Therefore, researchers might be expected to have investigated the effects of ADHD symptoms on Miranda-related competencies. However, only one published study utilizing a sample of juvenile defendants has considered this question. Viljoen and Roesch (2005) examined the relationship between psychological symptoms, including ADHD symptoms, and competence to waive interrogation rights using Grisso’s (1998) Miranda measures. While they failed to find relationships for other symptom constellations (e.g., depression, anxiety, or behavior problems), ADHD symptoms were significantly associated with deficits on several Miranda scales. Specifically, higher scores on the psychomotor excitation subscale of the Brief Psychiatric Rating Scale for Children (BPRS-C; Hughes, Rintelmann, Emslie, Lopez, & MacCabe, 2001) assessing ADHD symptoms such as hyperactivity and distractibility, predicted poorer performances on the CMR ($\beta = -.24$) and CMR-R ($\beta = -.17$). Moreover, performance on the attention cluster of the Woodcock-Johnson III Cognitive Assessment Battery (WJ-III; Woodcock, McGrew, & Mather, 2001), which measures the ability to attend to relevant information, significantly predicted scores on the CMR ($\beta = .24$) and the FRI-NI ($\beta = .30$). Further research needs to be conducted in order to better understand the relationship between Miranda-related competencies and ADHD, especially in regards to adult correctional populations.
Abnormal Mental States

Defendants may suffer from transient mental states that adversely influence their functional capacities without having a history of mental disorder (Grisso, 2003; Gudjonsson, 2003). For example, defendants may experience extreme anxiety related to their current circumstances and uncertainty about what is likely to happen to them at the time of their arrests. Medical issues and sleep deprivation may also result in a disturbed mental state during the police interrogation. However, one of the most common issues affecting defendants at the time of arrest and during police interviews is drug and alcohol intoxication and the effects of withdrawal. This topic is discussed in detail below.

Substance use. Intoxication from alcohol or drugs is commonly seen among arrestees in the United States. According to the NIJ Arrestee Drug Abuse Monitoring (ADAM) program (Zhang, 2003), more than 70% of both male and female arrestees tested positive for drugs or alcohol within 48 hours of arrest, with more than 30% of those testing positive for multiple drugs. Despite such high numbers, Chen, Stephens, Cochran, and Huff (1997) argue that these rates may underestimate the actual prevalence of substance abuse due to the voluntary nature of urinalysis (i.e., higher refusal rates for substance abusers).

Several researchers have utilized structured interviewing techniques to examine the prevalence of substance use disorders in both male and female correctional populations. Regarding male prisoners, Peters, Greenbaum, Edens, Carter, and Ortiz (1998) reported that the majority (56%) were retrospectively diagnosed with substance abuse or dependence disorders for the 30 days prior to incarceration. In relation to female
populations, 60 percent of jail detainees met substance abuse or dependence diagnoses within six months of arrest (Teplin, Abram, & McClelland, 1996), while just under half of female convicted felons met diagnostic criteria within six months of entering prison (Jordan, Schlenger, Fairbank, & Caddell, 1996). It should be noted that accurate substance use prevalence rates are difficult to obtain in correctional settings when relying on self-report information due to the perceived consequences among inmates for disclosing substance use history. Regardless, all of these studies reveal high prevalence rates of substance use in offender populations, with over 70% testing positive for drugs or alcohol and over 50% meeting a substance-related diagnosis.

Deficits in cognitive functioning are common among substance using populations and may contribute to impaired abilities at the time of arrest and during questioning. Reviews of research related to the negative effects of substance use on cognitive functioning (Lundqvist, 2005; Verdejo-Garcia, Lopez-Torrecillas, Gimenez, & Perez-Garcia, 2004; Vik, Cellucci, Jarchow, & Hedt, 2004) indicate that these impairments differ widely based on the type of substance being used. For instance, alcohol use has been associated with deficits in abstract reasoning, learning and recalling information (Vik et al.), as well as impaired verbal abilities (Parker, Chelune, Hamblin, & Kitchens, 1984; Williams & Skinner, 1990; Yohman & Parsons, 1987). Impairments in attention and memory functions have been associated with the use of cannabis, cocaine, methamphetamine, ecstasy, and opioids (Lundqvist; Verdejo-Garcia et al.; Vik et al.). Methamphetamine and opioid users also display poor decision-making abilities (Verdejo-Garcia et al., Vik et al.). Problems with impulse control and response inhibition have
been noted in cocaine, ecstasy, and opioid users, along with impaired verbal abilities (Lundqvist; Verdejo-Garcia et al.; Vik et al.). Although the specific impairments may vary depending on the type of substance being used, all drugs have substantial effects on the brain that can produce a range of short- and long-term cognitive deficits in users.

The majority of research examining the relationship between substance use and cognitive impairment categorize the effects by one isolated substance; however, most substance-dependent individuals are polysubstance users. Therefore, studies that report cognitive impairments related to the primary or preferred drug cannot assume the results are unique to that drug. Rather, polysubstance use causes additive negative effects on the brain that result in a greater number of impaired functions and an increase in the magnitude of damage (Lundqvist, 2005; Verdejo-Garcia et al., 2004). Considering the high prevalence of substance use in correctional populations with the majority using multiple substances, these significant deficits must be considered when evaluating defendants’ competence to waive their Miranda rights and subsequent decisions on whether to provide inculpatory information to the police.

Gudjonsson (2003) reported that consumption of illicit substances during the 24 hours preceding arrest was the single best psychological predictor of a confession being made during a police interrogation. For instance, substance users may waive their Miranda rights because they are focusing exclusively on the short-term consequences of their behavior; their goal is to be released from custody and obtain more drugs (Gudjonsson). According to Grisso (2003), suspects who are intoxicated also have greater difficulty understanding the rights or making voluntary choices regarding the waiver of
their rights. Drug withdrawal can also lead to mental states that limit the ability to think rationally and autonomously (Davison & Forshaw, 1993). On this point, Sigurdsson and Gudjonsson (1994) investigated the effects of substance intoxication and withdrawal on the mental state of criminal suspects at the time of their confession by asking the suspects to rate their thoughts, feelings, and behaviors at the time of the police interrogation. Results suggested that suspects who were intoxicated or withdrawing from substances at the time of the interrogation felt confused and were unable to think clearly. This subjective report of criminal suspects is consistent with research regarding the cognitive deficits associated with substance use (Lundqvist, 2005; Verdejo-Garcia et al., 2004; Vik et al., 2004). Problems with concentration, memory, and rational decision-making may make it difficult for some substance-using suspects to fully understand their rights and the questions asked, as well as to appreciate the long-term consequences of the answers they provide. Therefore, defense attorneys sometimes challenge the validity of a Miranda waiver and/or confession obtained while suspects are intoxicated or withdrawing from alcohol or drugs (Davison & Forshaw; Gudjonsson; Weiss, 2003).

**Current Study**

An assessment of the totality of the circumstances is required in evaluating the validity of Miranda waivers (Grissio, 2003). Therefore, psychologists conducting such evaluations must carefully assess the relevant psychological variables. The psychological vulnerabilities model introduced by Gudjonsson (2003) provides a conceptual framework to aid in conducting a comprehensive assessment related to the voluntariness and reliability of a Miranda waiver. As noted, this model is categorized into four domains:
cognitive functioning, personality characteristics, mental disorders, and abnormal mental states. However, the majority of research studies investigating Miranda-related capacities has exclusively examined the effects of cognitive variables (Bishop, 1990; Clare & Gudjonsson, 1995; Fulero & Everington, 1995; Grisso, 1981; Osman, 2005; Perske, 2000). Limited research (Everington & Fulero, 1999; Redich et al., 2003) has been conducted on how personality characteristics affect the validity of a waiver. Only two studies (Cooper, 2005; Rogers, Harrison, Hazelwood, et al., 2007) have addressed the role of mental disorders on Miranda competence, both examining severe Axis I disorders rather than the more prevalent clinical conditions. Finally, impaired mental states have been virtually ignored in literature pertaining to Miranda-related capacities.

Therefore, the current study aims to contribute to the literature on mental disorders and mental states by examining the relationship between defendants’ Miranda-related competencies and two of the most common conditions found in correctional populations: ADHD and substance abuse. In addition to attention deficits, adults with ADHD tend to demonstrate impairments in problem-solving (Schoechlin & Engel, 2005; Woods et al., 2002), verbal memory (Obolensky, 2006; Quinlan & Brown, 2003; Schoechlin & Engel, 2005; Woods et al., 2002), and reading comprehension (Samuelsson, Lundberg, & Herkner, 2004). Similarly, substance use has been linked to a variety of cognitive deficits, including attention, memory, and decision making (Lundqvist, 2005; Verdejo-Garcia et al., 2004; Vik et al., 2004). Such deficits are hypothesized to significantly impair defendants’ Miranda comprehension and reasoning ability.
ADHD and substance abuse are highly prevalent clinical conditions amongst criminal defendants. ADHD was found to occur in 25.5% of male prison inmates (Eyestone & Howell, 1994). Moreover, according to the NIJ ADAM program (Zhang, 2003), more than 73% of arrestees tested positive for drugs or alcohol within 48 hours of arrest. These estimates confirm the significant likelihood of impairment at the time of arrest. Given that Miranda warnings are typically provided shortly after detainment and are often quite difficult and complex (Rogers, Harrison, Shuman, et al., 2007; Rogers, Hazelwood, et al., 2007), these conditions are likely to have a substantial impact on defendants’ capacity to comprehend their rights and make rational decisions.

Research Questions and Hypotheses

Adults with ADHD may suffer from a range of significant cognitive deficits that could affect their ability to understand and appreciate their Miranda rights (Obolensky, 2006; Quinlan & Brown, 2003; Samuelsson, Lundberg, & Herkner, 2004; Schoechlin & Engel, 2005; Woods et al., 2002). The first research question investigates the effects of ADHD on Miranda-related capacities. For all of the following hypotheses, Miranda abilities are defined as: (a) comprehension of Miranda warnings, as measured by the Miranda Statements Scale (Rogers, 2005) and the Miranda Vocabulary Scale (Rogers, 2006b), and (b) Miranda reasoning ability, as measured by the Miranda Rights Scale (Rogers, 2006a).

- Hypothesis 1: Defendants receiving an ADHD diagnosis will evidence more impaired Miranda abilities than non-ADHD defendants.
• Hypothesis 2: It is hypothesized that the components of ADHD (inattention, impulsivity, and hyperactivity) will show differential relationships with Miranda-related capacities. Specifically, inattention will be most strongly correlated with Miranda comprehension, while impulsivity and hyperactivity will be most strongly correlated with Miranda reasoning.

Grisso (2003) posited that suspects who are intoxicated have greater demands placed on their capacities to understand the rights or to make voluntary choices regarding the waiver of their rights. The second research question examines the impact of substance use on Miranda competencies.

• Hypothesis 3: It is hypothesized that recent (i.e., past 7 days) substance use will significantly predict impairment in Miranda abilities.

• Hypothesis 4: Defendants engaged in severe substance use will demonstrate greater impairment in Miranda abilities than other defendants. Specifically, defendants receiving substance dependence diagnoses will exhibit more impairment in Miranda competencies than defendants not meeting any substance-related diagnosis.

• Hypothesis 5: Severity of substance use (i.e., number of reported substance dependence symptoms) will better predict deficits in Miranda abilities than recency of substance use (i.e., number of past 7 days that substances were used).

Both intellectual and verbal abilities (Bishop, 1990; Clare & Gudjonsson, 1995; Everington & Fulero, 1999; Fulero & Everington, 1995; Grisso, 1981; Osman, 2005;
Perske, 2000) as well as mental disorders (Cooper, 2005; Rogers, Harrison, Hazelwood, et al., 2007) have been found in prior research to affect Miranda-related capacities. The third research question addresses whether ADHD and substance use evidence incremental validity beyond the effects of these areas of functioning.

- **Hypothesis 6:** It is hypothesized that attentional abilities, as measured by (a) the Visual Search and Attention Test (VSAT; Trennery, Crosson, DeBoe, & Leber, 1990) and (b) number of reported ADHD symptoms, and substance use variables (i.e., recent substance use and number of substance dependence symptoms that are endorsed) will remain significant predictors of impaired Miranda capacities, when considering the effects of both cognitive variables and psychological impairment.

The final research question tests Gudjonsson’s (2003) psychological vulnerabilities model by exploring the dimensions that underlie Miranda-related competencies.

- **Hypothesis 7:** It is hypothesized that exploratory factor analysis will result in three dimensions related to Miranda abilities that support Gudjonsson’s (2003) model. Specifically, the cognitive variables (i.e., FSIQ, VIQ, Reading and Listening Comprehension), psychological variables (i.e., GAS score, ADHD symptoms), and mental state variables (i.e., recent substance use, number of endorsed substance dependence symptoms, and current attentional impairment) will each form a separate factor.
CHAPTER 2

METHOD

Design

A quasi-experimental, within-subjects design was utilized to examine the relationship between characteristics of jail detainees and their Miranda comprehension and reasoning. Independent variables included IQ, reading comprehension, listening comprehension, neurocognitive functioning, impairment in psychological functioning, substance use, and attention deficits. Through interview measures, both the level of recent substance use as well as substance abuse and dependence diagnoses were considered. Attention deficit-hyperactivity disorder (ADHD) diagnoses were established through an assessment of ADHD symptomatology, and a measure of sustained attention was administered to confirm current attentional impairment. Dependent variables were measures related to (a) Miranda comprehension, as measured by the Miranda Statements Scale (MSS; Rogers, 2005) and the Miranda Vocabulary Scale (MVS; Rogers, 2006b), and (b) decisional abilities, via the Miranda Rights Scale (MRS; Rogers, 2006a).

Participants

The sample consisted of 118 detained adult offenders from Grayson County Jail, a correctional setting in proximity to both urban (i.e., Dallas and Fort Worth) and rural communities. Eighteen of those participants have some missing data due to receiving an incomplete protocol for the Diagnostic Interview for Children and Adolescents – Revised (DICA-R; Reich, 2000); however, they were included in any analysis that did not involve that measure. All inmates were interviewed within 36 hours of arrest, with most
evaluations (84.7%) conducted within one day of arrest. Participants were recruited from the jail’s holding cells, and included both male ($n = 90$) and female ($n = 28$) inmates.

Materials

*Demographic Information Form*

Basic demographic and historical information was gathered by self-report from the participants. This information included the following demographic data: date of birth, ethnicity, primary language, highest level of education attained, marital status, and usual occupation. Relevant history was also obtained, including: date and time of arrest, current charges, number of total arrests, and number of psychiatric hospitalizations.

*Measures of Cognitive Functioning*

*Wechsler Abbreviated Scale of Intelligence (WASI).* The WASI (Wechsler, 1999) is a well-validated brief test of intelligence that is composed of four subscales (Vocabulary, Similarities, Block Design, and Matrix Reasoning). Based on these subtests, a Verbal IQ, Performance IQ, and Full Scale IQ are derived. Internal consistency was demonstrated for WASI subscales with average split-half reliability coefficients ranging from .92 to .94. Average test-retest reliability coefficients for an adult sample range from .79 to .90 for individual subtests and from .87 to .92 for the IQ scales. Regarding concurrent validity, WASI IQ scores correlate highly with the comprehensive WAIS-III (Wechsler, 1997) as a measure of verbal ($r = .88$), performance ($r = .84$), and overall ($r = .92$) intelligence.

*Wechsler Individual Achievement Test 2nd Edition (WIAT-II).* The WIAT-II (Psychological Corporation, 2002) assesses academic achievement in a broad range of
skills and yields grade-equivalent and standard scores that are based on extensive normative data on adult populations. For the current study, the Reading Comprehension and Listening Comprehension subtests were administered. The Reading Comprehension subtest requires the examinee to read passages and answer questions about the content and vocabulary. Split-half reliability coefficients for Reading Comprehension averaged .96 and the test-retest stability coefficient was .81 for adult samples. The Listening Comprehension subtest measures three domains: receptive vocabulary, sentence comprehension, and expressive vocabulary. Split-half reliability coefficients for listening comprehension averaged .87 and test-retest stability was reported at .93 for adults.

Measure of Psychological Functioning

Schedule of Affective Disorders and Schizophrenia-Change Version (SADS-C). The SADS-C (Spitzer & Endicott, 1978) is a semistructured diagnostic interview designed to evaluate key symptoms of psychopathology. For use with jail samples, Rogers, Jackson, Salekin, and Neumann (2003) found a good model fit (CFI = .92; RCFI = .95) via confirmatory factor analysis for its four clinical scales: Psychosis, Mania, Dysphoria, and Insomnia. Its Global Assessment Scale (GAS), similar to the GAF in the DSM-IV, provides an overall rating of impairment. The SADS-C has impressive interrater reliability at a symptom level (M ICC = .95). It also evidences moderate convergent validity and excellent discriminant validity (Rogers, Sewell, Ustad, Reinhardt, & Edwards, 1995).
Attention Measures

ADHD Section of the Diagnostic Interview for Children and Adolescents – Revised (DICA-R). The DICA-R (Reich, 2000) is a reliable and valid semi-structured Axis I interview for children and adolescents that is based on the DSM-III-R (APA, 1987). In the present study, the Attention Deficit-Hyperactivity Disorder (ADHD) section was utilized, which provides both a retrospective and current evaluation of ADHD symptoms that can be used in determining a diagnosis of ADHD. The ADHD section of the DICA-R has been validated on adolescent populations. The test-retest reliability is moderate in adolescents for current (.59) and lifetime (.65) ADHD diagnoses. In examining convergent validity, De la Osa, Ezpeleta, Domenech, Navarro, and Losilla (1997) reported moderate to low correlations (ranging from .29 to .59) between the ADHD section of the DICA-R and the Attention Problems and Externalizing dimensions of the Child Behavior Checklist (CBCL). The DICA-R provides a valid retrospective assessment of ADHD for adolescent and adult populations by including inquiries about early childhood symptoms. More recently updated structured interview assessments of ADHD did not provide a validated method of evaluating both retrospective and current symptoms in older populations.

Visual Search and Attention Test (VSAT). The VSAT (Trennery, Crosson, DeBoe, & Leber, 1990) is a norm-referenced measure of sustained attention that was used in the current study to confirm impairment in attention. It consists of four visual cancellation tasks, Tasks 1 and 2 represent practice trials while Tasks 3 and 4 are used for formal scoring. The VSAT obtained a test-retest reliability coefficient of .95. In terms of
construct validity, the VSAT evidenced moderate correlations (.54 and .65) with Block Design and Digit Symbol scale scores of the WAIS-R, which contain a sustained visual attention component (Trennery et al., 1990). Moreover, moderate correlations (.55 and .50) were found between the VSAT and measures of focused attention, including the Paced Auditory Serial Addition Test (PASAT) and the Trail Making Test – Part B (O’Donnell, MacGregor, Dabrowski, Oestreicher, & Romero, 1994).

**Substance Use Measures**

*Substance Use Inventory (SUI).* The SUI (Weiss, Hufford, Najavits, & Shaw, 1995) is a self-report instrument used to determine the severity and frequency of substance use in the past seven days. The measure evaluates the examinee’s reported usage of alcohol, cocaine, heroin, marijuana, sedatives, stimulants, PCP, and hallucinogens. Although the SUI is a face valid instrument, previous studies provide evidence of its criterion-related validity (Hien, Cohen, Miele, Litt, & Capstick, 2004; Najavits, Weiss, Shaw, & Muenz, 1998). Najavits et al. used urinalysis and breath alcohol results to ensure the accuracy of the participants’ self-report, and found that 73% of self-reports were consistent with laboratory results. Of the inconsistent reports, only one discrepancy involved the denial of substance abuse contradicted by positive test results. Likewise, Hien et al. reported no discrepancies between the participants’ self-report and urinalysis results.

*Substance Use Sections of the Mini International Neuropsychiatric Interview (MINI).* The MINI (Sheehan et al., 1998) is a brief, semi-structured diagnostic interview used to assess for 17 Axis I disorders. For the current study, only the sections focusing on substance use diagnoses were administered: Alcohol Abuse, Alcohol Dependence, Drug
Abuse, and Drug Dependence. Reliability estimates for these four sections were very high; kappa coefficients ranged from .88 to 1.00 for interrater reliability and ranged from .85 to .96 for test-retest reliability (Sheehan et al., 1997). Validation studies revealed variable results for the concurrent validity of the alcohol and drug dependence diagnoses (Lecrubier et al., 1997; Sheehan et al., 1997). When compared to the Composite International Diagnostic Interview (CIDI; WHO, 1990), a high level of agreement was achieved with kappa coefficients ranging from .81 to .82 (Lecrubier et al.). However, when compared to the Structured Clinical Interview for DSM-III-R Patient Version (SCID-P; Spitzer, Williams, Gibbon, & First, 1990), the alcohol dependence diagnosis yielded moderate agreement (kappa = .60) and the drug dependence diagnosis resulted in low agreement (kappa = .30; Sheehan et al., 1997). One possibility for this discrepancy is the time frame utilized for dependence diagnoses: six months (original MINI and CIDI) versus 12 months (current MINI and SCID-P).

**Miranda-Related Measures**

**Miranda Statements Scale (MSS).** The MSS (Rogers, 2005) assesses understanding of the five components of the Miranda warning through the participants’ ability to paraphrase the statements in their own words. It is composed of two versions (MSS-A and MSS-B) that were developed through a multi-step process, each with nationally-representative Miranda components at five different reading levels. First, unique Miranda statements for the five components were compiled from 560 Miranda warnings that were collected from jurisdictions across the United States. These statements were categorized into five groups based on Flesch Kincaid reading
comprehension level, ranging from low (< grade 6) to high (≥ grade 12). Three legal experts independently rated each statement based on representativeness (i.e., correspondence with the Miranda decision) and content diversity (i.e., variance in the content and language of the warning). They achieved a high level of concordance (98.3%) after two iterations.

Content analysis of the 560 Miranda warnings was used to establish basic categorical distinctions for each Miranda statement. Trained research assistants independently categorized the elements of these Miranda components and reached a high level of agreement ($M$ kappa = .88; range of .82 to .96). The MSS is scored by assessing the presence or absence of each element of the Miranda components in the participants’ response. The interrater reliability for the MSS-A and MSS-B scoring categories on 30 randomly selecting cases from pilot research was very high ($M$ kappa = .88). Total scores for the MSS consist of summing the scores for each element within the Miranda components. These scores are operationalized into two categories of comprehension: (a) poor (less than 50% comprehension) and (b) good (70% or higher comprehension).

Because the Supreme Court decisions regarding Miranda rights have not quantified levels of comprehension, Rogers et al. (2007) justified 50% as a cut score for poor understanding based on a defendant’s inability to understand even half of the content of the warnings.

*Miranda Vocabulary Scale (MVS).* The MVS (Rogers, 2006b) assesses understanding of words commonly used in Miranda warnings. It was developed by first compiling a list of Miranda-relevant words from a survey of 560 Miranda warnings and
waivers from jurisdictions throughout the United States (Rogers, Harrison, Shuman, et al., 2007). This first step resulted in a list of 109 potentially relevant vocabulary words. The second step involved eliminating words used in less than four jurisdictions, as well as plural and other similar word forms; a refined list of 49 words emerged. Although not originally meeting the frequency criterion, the term “indigent” was later added by the consensus of two Miranda researchers on the basis that the word is difficult to define, critical to the understanding of a Miranda warning, and was more represented in the second survey of Miranda warnings (Rogers, Hazelwood, Sewell, Harrison, et al., 2008). As a third step, this preliminary list of vocabulary words was further refined by examining the word’s usefulness in discriminating between poor and good Miranda comprehension. In the fourth step of the MVS development, the retained words were independently rated by three Miranda experts regarding each word’s importance to Miranda comprehension and reasoning. The revised MVS is composed of 36 words varying in frequency and complexity.

MVS items are scored from zero to four points based on the following general criteria: 0 = incorrect; 1 = a correct definition or used in a sentence, but irrelevant to Miranda; 2 = the vocabulary word is used correctly in a sentence, and relevant to Miranda; 3 = partially correct definition, and relevant to Miranda; and 4 = correct definition, and relevant to Miranda (Rogers, Hazelwood, Sewell, Blackwood, Rogstad, & Harrison, 2008). The five levels of general scoring criteria indicate varying levels of understanding and the ability to manipulate information that uses its vocabulary. Specific scoring samples for each MVS item, consisting of dictionary definitions and sample...
responses from pilot research, are included at all levels of the general criteria to facilitate scoring. The MVS has excellent scale homogeneity (alpha = .91) and average inter-item correlations of .21. The interrater reliability was very high for the total MVS (r = .99) and individual MVS items (M r = .95; range from .78 to 1.00). It also demonstrates good convergent and discriminant validity.

*Miranda Rights Scale (MRS).* The MRS (Rogers, 2006a) is a rationally constructed scale that examines Miranda reasoning ability through an interview format. It asks participants to address the possible advantages and disadvantages on four Miranda-related issues: (a) waiving their right to silence, (b) asserting their right to silence, (c) waiving their right to an attorney, and (d) asserting their right to an attorney. The MRS also asks participants to disclose their decisions regarding whether they waived or exercised their Miranda rights in their own cases and reasons for that decision.

MRS items are scored from zero to three points based on the following general criteria: 0 = impaired reasoning or a damaging factual error; 1 = unclear, but not obviously impaired, reasoning; 2 = reasoning that only involves the immediate circumstances; and 3 = reasoning that takes into account long-term considerations. Items comprise two rationally-derived scales, (a) Exercise Rights, which assesses a participant’s ability to reason about maintaining his or her rights, and (b) Waive Rights, which assesses a participant’s ability to reason about relinquishing his or her rights. Specific scoring samples for each MRS scale are included to facilitate scoring. These samples consist of both legally-relevant and personal reasons to waive or exercise Miranda rights based on (a) Gudjonsson’s (1999) model of confessions and (b) responses
from pilot research. The MRS demonstrated excellent interrater reliability on 40 randomly selected cases ($M_r = .94$; range of .86 to 1.00).

Procedure

*Informed Consent and Confidentiality*

The present study was approved by the University of North Texas’ Institutional Review Board (IRB) on February 2, 2007. Participants who agreed to participate were provided with the IRB-approved consent form (see Appendix A) and asked to give written, informed consent prior to participating in the study. The consent form was read to potential participants with limited reading comprehension.

Although the present study carries very little potential risk to detainees, stringent procedures were implemented to protect participants’ confidentiality. Research protocols do not include any personal identifiers. A research number is the only method of specifying participants. Because the data are anonymous, it is not possible to link the research data to specific defendants.

*Process*

A major goal of the current study was to maximize its ecological validity and evaluate a representative group of diverse defendants. Therefore, the inclusion criteria were very broad: participants had to be fluent in English and be able to give informed consent. Regarding the latter, only patients who were able to demonstrate an adequate understanding of the risks and benefits of participation were allowed to participate.

The exclusion criteria were also minimal to ensure a wide range of defendants were provided the opportunity to participate. The correctional staff was asked to indicate
patients who would likely be uncooperative, violent, or too psychologically impaired to participate in the study. Defendants with extreme psychopathology, such as florid psychosis or severe suicidality, were excluded only if their impairment precluded their participation. A very small but unknown number of participants were excluded for security reasons based on recently violent behavior or escape attempts.

Research staff consisted of four advanced doctoral students in psychology who had prior experience in conducting research studies. Each of these doctoral students previously completed formal training in cognitive and personality assessments as well as the specialized measures used in the current study. Their ability to administer and carry out standardized scoring of all of the instruments was evaluated before beginning the present research study. Furthermore, the research staff was knowledgeable regarding Miranda warnings and issues. They were responsible for all aspects of data collection, entry, and analysis.

Participants were recruited from the jail’s holding facilities with the assistance of the correctional staff. Specifically, correctional staff escorted a researcher to the holding cells and introduced the researcher to the defendants. The researcher then provided a brief description of the study, and explained that $15 would be deposited in their institutional account as an external incentive for completing the testing session. Participants who agreed to participate in the research study met individually with the researcher. The purpose of the study, risks and benefits of participation, and limits on confidentiality were then discussed in more detail with the potential participant. Those participants still
interested in participating were asked to provide written, informed consent before beginning the testing.

The study was conducted in a multipurpose room that was furnished adequately with a table and chairs. The room afforded reasonably quiet conditions and was typically free from distractions. Confidentiality was maintained as the participants’ responses could not be heard by correctional staff or by the inmate population. The total participation time for each inmate ranged from approximately two to four hours depending on the speed of the participants and the number of interruptions for standard correctional practices (e.g., booking the defendant). Participants were given bathroom and other breaks, as needed, to minimize fatigue.

The measures were administered using two quasi-random patterns to reduce ordering effects. Following the demographics questions, the SADS-C was administered first in both patterns in order to build rapport. The remaining order was determined by placing two instruments between each warning of the MSS so that the five Miranda warnings were placed at similar intervals from each other and dispersed evenly throughout the testing session. In the alternate administration pattern, the order of each set of two instruments was reversed.

Given the two versions of MSS, participants were randomly assigned to receive either MSS-A or MSS-B. The five Miranda warnings of the MSS were administered from most difficult (≥ grade 12) to easiest (< grade 6) to minimize learning of the material. To test for differences between listening and reading comprehension, the method of administration was varied. Each participant received half of the Miranda versions
presented orally and half presented in a written format. The former is the standard format when arrested in the community, whereas the latter often occurs prior to formal interrogation.

Debriefing occurred following completion of the testing and the participants were given an opportunity to ask questions regarding the study. Any inquiries related to the meaning of the Miranda warnings or purpose of a specific instrument were answered at that time. At the end of each day of data collection, the primary researcher compiled a list of inmates that participated that day. The correctional staff responsible for the inmates’ institutional accounts was then provided with the list and monetary compensation for the participants.
CHAPTER 3

RESULTS

The sample was composed of 118 detained adult offenders, with 90 (76.3%) male and 28 (23.7%) female participants. As reported in Table 1, the racial composition of the sample was 20.3% African American, 66.1% European American, 5.1% Hispanic American, 5.1% biracial, and 3.4% other. There was not a significant difference between genders regarding the racial proportions ($X^2[4] = 1.29, p > .05$).

Table 1

Racial and Gender Representation of the Current Sample

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Racial Composition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>20 (22.2%)</td>
<td>4 (14.3%)</td>
<td>24 (20.3%)</td>
</tr>
<tr>
<td>European American</td>
<td>59 (65.6%)</td>
<td>19 (67.9%)</td>
<td>78 (66.1%)</td>
</tr>
<tr>
<td>Hispanic American</td>
<td>4 (4.4%)</td>
<td>2 (7.1%)</td>
<td>6 (5.1%)</td>
</tr>
<tr>
<td>Biracial</td>
<td>4 (4.4%)</td>
<td>2 (7.1%)</td>
<td>6 (5.1%)</td>
</tr>
<tr>
<td>Other</td>
<td>3 (3.3%)</td>
<td>1 (3.6%)</td>
<td>4 (3.4%)</td>
</tr>
</tbody>
</table>

Table 2 includes descriptive data for the sample’s age, education level, arrest history, and number of psychiatric hospitalizations. Overall, the mean age was approximately 30 with a range of 17 to 58. Unlike past research, the mean educational
level was at a high school graduate level ($M$ years = 12.10), but ranged markedly from elementary to graduate level (5 to 20 years). On average, the sample had an extensive history of arrests ($M$ arrests = 8.64; range = 1 to 100). Interestingly, the female participants averaged less than half the arrests ($M$ arrests = 4.00, $SD = 2.68$) of their male counterparts ($M$ arrests = 10.03, $SD = 13.67$; $t[115] = 2.27, p < .05$). Only a small proportion of the sample reported a significant history of psychiatric hospitalizations with most participants (81.4%) never being hospitalized. For those hospitalized, they averaged 2.32 stays ($SD = 2.30$).

Table 2

*Demographic Data for the Total Sample*

<table>
<thead>
<tr>
<th></th>
<th>$M$</th>
<th>$SD$</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>30.46</td>
<td>10.14</td>
<td>17-58</td>
</tr>
<tr>
<td>Education</td>
<td>12.10</td>
<td>1.96</td>
<td>5-20</td>
</tr>
<tr>
<td>Number of arrests</td>
<td>8.64</td>
<td>12.31</td>
<td>1-100</td>
</tr>
<tr>
<td>Psychiatric hospitalizations</td>
<td>.43</td>
<td>1.33</td>
<td>0-10</td>
</tr>
</tbody>
</table>

As demonstrated in Table 3, the sample of adult offenders was characterized by a remarkable range of cognitive functioning. The sample’s overall intellectual abilities ranged from the Extremely Low to High Average range ($M$ Full scale IQ = 91.47, range of 59-119). Only half (49.6%) of participants scored in the Average to High Average range ($\geq 90$) on the Wechsler Abbreviated Scale of Intelligence (WASI). However, less than 5% of the sample scored in the mentally retarded range of intellectual functioning.
Of relevance to Miranda abilities, the sample had substantially lower verbal ($M$ Verbal IQ $= 88.31$) than nonverbal abilities ($M$ Performance IQ $= 96.74; d = .69$). On average, the participants demonstrated Low Average reading ($M$ standard score $= 83.23$) and listening ($M$ standard score $= 88.58$) academic achievement; however, these scores also varied from the Extremely Low to High Average range. These standard scores represent an average grade equivalent of approximately $9^{th}$ grade for both reading and listening comprehension, with a range from $1^{st}$ grade to college level abilities. Notably, more than $10\%$ of the sample demonstrated less than $6^{th}$ grade level academic abilities (reading comprehension $= 12.3\%$; listening comprehension $= 10.4\%$).

The sample generally evidenced stable psychological functioning, averaging mild impairment ($M$ Global Assessment Scale (GAS) $= 62.69$). A score in this range (i.e., 61 to 70) is qualitatively described by the Schedule of Affective Disorders and Schizophrenia – Change Version (SADS-C) as “some mild symptoms or some difficulty in several areas of functioning, but generally functioning pretty well” (Spitzer & Endicott, 1978, p. 11). However, the sample consisted of $3.4\%$ having scores at or below 30, signifying serious impairment in behavior, communication, or judgment. At the time of testing, symptoms of depression and anxiety were commonly reported ($M$ SADS-C Dysphoria $= 13.81$). Most defendants were not experiencing psychotic symptoms ($M$ SADS-C Psychotic $= 4.28$). Although $29.6\%$ of defendants evidenced some suspiciousness, relatively few ($< 5\%$) demonstrated delusions or hallucinations.
Table 3

*Psychological Characteristics of the Total Sample*

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal IQ</td>
<td>88.31</td>
<td>12.19</td>
<td>55-121</td>
</tr>
<tr>
<td>Performance IQ</td>
<td>96.74</td>
<td>12.23</td>
<td>61-119</td>
</tr>
<tr>
<td>Full Scale IQ</td>
<td>91.47</td>
<td>11.82</td>
<td>59-119</td>
</tr>
<tr>
<td>Reading Comprehension⁴</td>
<td>83.23</td>
<td>17.99</td>
<td>40-114</td>
</tr>
<tr>
<td>Reading Grade Level</td>
<td>9.19</td>
<td>3.00</td>
<td>1.0-13.0</td>
</tr>
<tr>
<td>Listening Comprehension⁴</td>
<td>88.58</td>
<td>13.84</td>
<td>33-117</td>
</tr>
<tr>
<td>Listening Grade Level</td>
<td>9.20</td>
<td>2.63</td>
<td>1.2-13.0</td>
</tr>
<tr>
<td>SADS-C Psychotic</td>
<td>4.28</td>
<td>1.79</td>
<td>3-15</td>
</tr>
<tr>
<td>SADS-C Mania</td>
<td>7.00</td>
<td>2.74</td>
<td>5-21</td>
</tr>
<tr>
<td>SADS-C Dysphoria</td>
<td>13.81</td>
<td>6.44</td>
<td>7-33</td>
</tr>
<tr>
<td>SADS-C Global Assessment Scale</td>
<td>62.69</td>
<td>14.48</td>
<td>22-85</td>
</tr>
</tbody>
</table>

*⁴ Age-based standard scores.*

Three Miranda instruments served as the dependent measures for this study. Two addressed understanding and appreciation of the Miranda rights, (a) the Miranda Statements Scale (MSS; Rogers, 2005) and (b) the Miranda Vocabulary Scale (MVS; Rogers, 2006b). The Miranda Rights Scale (MRS, Rogers, 2006a) was used to assess decisional abilities related to Miranda reasoning. Table 4 displays descriptive data for the current sample on these three measures.
The understanding of Miranda statements declined as the reading comprehension of the Miranda warning became more challenging. At the easiest reading level (< 6th grade), the average score was 65.1% correct; however, the mean score decreased to approximately half (49.7%) correct at the most difficult reading level (>12th grade). Comprehension also decreased as a result of the method of administration utilized. Specifically, Miranda warnings administered in a written format (M percent correct = 62.1%) were better understood than those presented orally (M percent correct = 55.2%; t = 6.15, p < .001, d = .80).

The MVS was used to assess comprehension of specific Miranda vocabulary terms with a Total score ranging from zero to 144. The current sample achieved a mean score of 76.52, corresponding to moderate MVS performance (Rogers, Hazelwood, Sewell, Blackwood, et al., 2008). The term “coercion” proved to be the most difficult, with most participants (82.2%) providing an incorrect definition. On the other hand, very few (6.7%) were wrong in their definition of the term “silent.”

Participants demonstrated average to above average Miranda reasoning ability on the MRS with a total score of 16.64, out of a possible 24. Interestingly, significantly higher scores were exhibited on the Waive than Exercise scales (t = 2.61, p =.01; d = .36). This finding indicates that participants demonstrated better reasoning ability regarding motivation to waive rather than exercise their Miranda rights.
Table 4

Descriptive Data for the Miranda Measures

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSS Easy&lt;sup&gt;a&lt;/sup&gt;</td>
<td>65.1</td>
<td>17.9</td>
<td>11-100</td>
</tr>
<tr>
<td>MSS Moderate&lt;sup&gt;a&lt;/sup&gt;</td>
<td>55.1</td>
<td>16.9</td>
<td>7-93</td>
</tr>
<tr>
<td>MSS Difficult&lt;sup&gt;a&lt;/sup&gt;</td>
<td>49.7</td>
<td>14.2</td>
<td>6-79</td>
</tr>
<tr>
<td>MSS Total&lt;sup&gt;a&lt;/sup&gt;</td>
<td>58.2</td>
<td>12.3</td>
<td>15-83</td>
</tr>
<tr>
<td>MSS Oral&lt;sup&gt;a&lt;/sup&gt;</td>
<td>55.2</td>
<td>13.7</td>
<td>22-92</td>
</tr>
<tr>
<td>MSS Written&lt;sup&gt;a&lt;/sup&gt;</td>
<td>62.1</td>
<td>13.9</td>
<td>4-88</td>
</tr>
<tr>
<td>MVS Total Score</td>
<td>76.52</td>
<td>20.87</td>
<td>2-127</td>
</tr>
<tr>
<td>MRS Total Score</td>
<td>16.64</td>
<td>2.80</td>
<td>10-22</td>
</tr>
<tr>
<td>MRS Waive</td>
<td>9.67</td>
<td>2.01</td>
<td>5-13</td>
</tr>
<tr>
<td>MRS Exercise</td>
<td>8.94</td>
<td>2.00</td>
<td>2-12</td>
</tr>
</tbody>
</table>

<sup>a</sup> Percentage correct.

Attention Deficit-Hyperactivity Disorder (ADHD)

The first research question examined the effects of ADHD on Miranda-related capacities. Several attention variables were included in the current study in order to evaluate both ADHD symptomatology and current attentional impairment. Table 5 summarizes the descriptive data for the attention variables from the DICA-R (Reich, 2000) and VSAT (Trennery et al., 1990). Overall, this sample of offenders reported an average of approximately six ADHD symptoms, but demonstrated a marked range from zero to 15 symptoms. The most commonly reported symptoms pertained to problems
with attention and impulsivity, such as daydreaming while working (55.0%), getting bored easily (48.0%), blurting out answers before the question is asked (48.0%), failing to finish tasks (44.0%), and being easily distracted by extraneous stimuli (43.0%). The less frequently reported symptoms tended to be related to hyperactivity, including difficulty awaiting turn (22.0%), trouble engaging in activities quietly (22.1%), talking excessively (24.6%), fidgeting (25.4%), and problems remaining seated (27.1%). However, these symptoms were still reported by close to one-fourth of the sample.

Performance on the Visual Search and Attention Test (VSAT), a measure of current sustained attention, covered the full spectrum from the 1st to 93rd percentile. Their average VSAT scores, close to the 15th percentile, are indicative of borderline impairment. However, almost half of the offenders (49.6%) scored at or below the 2nd percentile, indicating significantly impaired performance according to the VSAT interpretive guidelines. This finding suggests that attention difficulties are common amongst recently detained offenders.
Table 5

*Descriptive Data for the Attention Variables*

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>DICA-R Total Score</td>
<td>32.95</td>
<td>14.88</td>
<td>15-71</td>
</tr>
<tr>
<td>DICA-R Inattention Score</td>
<td>17.19</td>
<td>8.17</td>
<td>7-35</td>
</tr>
<tr>
<td>DICA-R Impulsivity Score</td>
<td>15.76</td>
<td>7.81</td>
<td>8-36</td>
</tr>
<tr>
<td>DICA-R Total Symptoms*a</td>
<td>5.99</td>
<td>4.19</td>
<td>0-15</td>
</tr>
<tr>
<td>DICA-R Inattention Symptoms*a</td>
<td>3.40</td>
<td>2.24</td>
<td>0-7</td>
</tr>
<tr>
<td>DICA-R Impulsivity Symptoms*a</td>
<td>2.59</td>
<td>2.36</td>
<td>0-8</td>
</tr>
<tr>
<td>VSAT Total Percentile</td>
<td>14.86</td>
<td>21.84</td>
<td>1-93</td>
</tr>
</tbody>
</table>

*a Symptoms are categorized as clinically relevant that have ≥ 3 ratings.

Current ADHD diagnosis was determined using ratings from the Diagnostic Interview for Children and Adolescents – Revised (DICA-R; Reich, 2000). As noted in the Methods chapter, the DICA-R was developed to assess ADHD according to the DSM-III-R (APA, 1987); therefore, ADHD could not be fully assessed because four criteria were added to the current DSM-IV-TR (APA, 2000). For subsequent analyses, participants were divided into three groups: (a) DSM-IV-TR ADHD (i.e., met diagnostic criteria regardless of the missing DSM-IV-TR criteria); (b) DSM-III-R ADHD (i.e., met criteria based on the DSM-III-R but not those for the DSM-IV-TR); and (c) non-ADHD (i.e., did not meet diagnostic criteria for either DSM-III-R or DSM-IV-TR). The following requirements must have been met to qualify for DSM-IV-TR ADHD: (a) the offender reports at least six current symptoms of inattention and at least six current symp
symptoms of hyperactivity-impulsivity on the DICA-R; and (b) onset of these symptoms began before the age of seven. It is very likely that more participants would have met criteria for DSM-IV-TR ADHD had the additional criteria been evaluated. Inclusion in the DSM-III-R ADHD group was based on the following requirements: (a) the offender did not meet DSM-IV-TR criteria; (b) endorsement of at least eight current symptoms of either inattention or hyperactivity-impulsivity; and (c) onset of these symptoms began before the age of seven. In order to confirm attention difficulties, impairment on the VSAT, as defined by the professional manual (Trennery et al., 1990), was also considered.

Table 6 displays frequency data for the three ADHD diagnostic groups categorized by impairment level on the VSAT. Approximately one-fourth (22.2%) of offenders met criteria for either DSM-III-R or DSM-IV-TR ADHD. However, only 16.7% of those meeting diagnostic criteria also demonstrated current attention deficits on a neuropsychological assessment instrument. Therefore, some (7.7%) of those reporting subjective experiences of inattention did not demonstrate any measurable deficits in their ability to sustain attention. A large and unexpected finding was that 36.7% of offenders evidenced significant attentional impairment without meeting ADHD criterion based on the DICA-R. These attentional deficits are likely due to substance intoxication or stress that are related to the defendants’ current circumstances (i.e., arrest and detention).
Table 6

*ADHD Diagnostic Classification and Current Attention Impairment on the VSAT*

<table>
<thead>
<tr>
<th>VSAT Impairment</th>
<th>No ADHD Diagnosis</th>
<th>DSM-III-R ADHD</th>
<th>DSM-IV-TR ADHD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal (≥17)</td>
<td>24 (80.0%)</td>
<td>4 (13.3%)</td>
<td>2 (6.7%)</td>
</tr>
<tr>
<td>Borderline (3 to 16)</td>
<td>13 (92.9%)</td>
<td>1 (7.1%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Significant (≤2)</td>
<td>33 (71.7%)</td>
<td>8 (17.4%)</td>
<td>7 (10.9%)</td>
</tr>
<tr>
<td>Total</td>
<td>70 (77.8%)</td>
<td>13 (14.4%)</td>
<td>7 (7.8%)</td>
</tr>
</tbody>
</table>

*Note.* VSAT Impairment is based on Percentile Ranking.

**Hypothesis 1**

Hypothesis 1 indicated that defendants receiving an ADHD diagnosis would evidence more impaired Miranda abilities than their non-ADHD counterparts. One-way between-subjects ANOVAs were conducted to determine differences between ADHD and non-ADHD defendants on MSS, MVS, and MRS scores. Cohen’s *d* were calculated to evaluate the effect size of these differences. In order to obtain well-defined groups and maximize group differences, the ADHD group (*n* = 13) was defined as: (a) inclusion in either the DSM-III-R or DSM-IV-TR group as defined above; and (b) significant impairment on the VSAT (i.e., ≤ 2nd percentile). Conversely, the control group (*n* = 12) was defined as: (a) no history of childhood ADHD before the age of seven (i.e., did not meet criteria for ADHD based on the offender’s self-report of lifetime ADHD symptoms); (b) less than four current symptoms of ADHD; and (c) normal performance on the VSAT (i.e., ≥ 17th percentile). Non-significant differences resulted between the
groups for all of the Miranda variables. Table 7 displays the means and standard
deviations for the two groups, along with $F$ values and Cohen’s $d$s.

Table 7

* Differences between ADHD Diagnostic Groups on the Miranda Measures *

<table>
<thead>
<tr>
<th>Measure</th>
<th>Non-ADHD</th>
<th></th>
<th>ADHD</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
<td>$F$</td>
<td>$d$</td>
<td></td>
</tr>
<tr>
<td>MSS Easy</td>
<td>67.0</td>
<td>23.9</td>
<td>65.4</td>
<td>16.5</td>
<td>.04</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>MSS Moderate</td>
<td>59.7</td>
<td>15.0</td>
<td>52.7</td>
<td>19.1</td>
<td>1.05</td>
<td>.41</td>
<td></td>
</tr>
<tr>
<td>MSS Difficult</td>
<td>49.9</td>
<td>10.6</td>
<td>51.1</td>
<td>17.3</td>
<td>.04</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>MSS Total</td>
<td>60.8</td>
<td>9.3</td>
<td>56.3</td>
<td>14.4</td>
<td>.84</td>
<td>.37</td>
<td></td>
</tr>
<tr>
<td>MSS Oral</td>
<td>57.7</td>
<td>12.2</td>
<td>53.0</td>
<td>14.3</td>
<td>.77</td>
<td>.35</td>
<td></td>
</tr>
<tr>
<td>MSS Written</td>
<td>64.8</td>
<td>9.3</td>
<td>59.6</td>
<td>15.6</td>
<td>1.03</td>
<td>.41</td>
<td></td>
</tr>
<tr>
<td>MVS</td>
<td>78.55</td>
<td>19.42</td>
<td>76.85</td>
<td>18.72</td>
<td>.05</td>
<td>.09</td>
<td></td>
</tr>
<tr>
<td>MRS</td>
<td>16.92</td>
<td>2.91</td>
<td>15.85</td>
<td>3.83</td>
<td>.61</td>
<td>.31</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* MSS scores are reported as percentage correct.

Supplementary analyses utilizing quartiles, rather than diagnostic groups, were
conducted. The DICA-R Total Score represents severity of current self-reported attention
symptoms; participants were divided into quartile groups, and ANOVAs were used to
compare the 1$^{\text{st}}$ and 4$^{\text{th}}$ quartile on measures of Miranda-related abilities. Predictably,
participants in the 1$^{\text{st}}$ quartile reported relatively mild current ADHD symptoms, whereas
their 4$^{\text{th}}$ quartile counterparts reported severe ADHD symptomatology. Table 8 displays
the $F$ values and Cohen’s $d$s for each of the Miranda variables. Severity of current ADHD
symptomatology significantly decreased performance on the MSS \((d = .46)\), especially when the warning was administered at a moderate reading level (i.e., \(8^{th}\) to \(10^{th}\) grade; \(d = .52)\). Interestingly, the presence of ADHD symptoms did not appear to make a significant difference when the warning was presented at the easiest or most difficult reading levels. This may be attributed to the fact that most individuals, regardless of level of impairment, can adequately comprehend the simple Miranda warnings. Moreover, the most difficult warnings are understood by very few individuals, even when no significant impairment is present. Another notable finding was that ADHD symptoms had a significant effect on comprehension of orally-presented warnings \((d = .54)\) but not written warnings \((d = .34)\). This finding likely indicates that warnings presented orally place higher cognitive demands on the individual than written warnings. Performance on the MVS was also significantly decreased by ADHD symptoms \((d = .46)\). Noteworthy differences were still not observed for MRS scores.
Table 8

*Effects of ADHD Symptom Severity on Miranda-related Capacities*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mild ADHD (n = 26)</th>
<th>Severe ADHD (n = 27)</th>
<th>F</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSS Easy</td>
<td>62.5 20.1</td>
<td>60.9 14.7</td>
<td>.12</td>
<td>.10</td>
</tr>
<tr>
<td>MSS Moderate</td>
<td>54.0 15.2</td>
<td>45.7 16.7</td>
<td>3.53*</td>
<td>.52</td>
</tr>
<tr>
<td>MSS Difficult</td>
<td>47.9 12.3</td>
<td>43.5 17.4</td>
<td>1.17</td>
<td>.30</td>
</tr>
<tr>
<td>MSS Total</td>
<td>57.3 11.3</td>
<td>51.4 13.8</td>
<td>2.82*</td>
<td>.46</td>
</tr>
<tr>
<td>MSS Oral</td>
<td>55.2 14.3</td>
<td>47.8 12.7</td>
<td>3.92*</td>
<td>.54</td>
</tr>
<tr>
<td>MSS Written</td>
<td>60.8 11.5</td>
<td>55.7 17.1</td>
<td>1.54</td>
<td>.34</td>
</tr>
<tr>
<td>MVS</td>
<td>82.00 19.85</td>
<td>71.62 23.97</td>
<td>2.76*</td>
<td>.46</td>
</tr>
<tr>
<td>MRS</td>
<td>16.96 2.75</td>
<td>16.67 3.23</td>
<td>.13</td>
<td>.10</td>
</tr>
</tbody>
</table>

Note. MSS scores are reported as percentage correct. *Significant at $p < .05$ for a directional hypothesis.

Beyond ADHD diagnoses, VSAT Total Percentile provides a measure of current attentional impairment. Participants were divided into “normal” and “significantly impaired” groups based on VSAT performance according to guidelines presented in the professional manual (Trennery et al., 1990). ANOVAs were used for comparisons on each Miranda variable. As noted in Table 9, results mirrored those found for ADHD symptom severity. As reported in the table, significant differences were found for MVS performance ($d = .39$) and overall MSS scores ($d = .37$), as well as when administered at a moderate reading level ($d = .45$) or presented orally ($d = .50$). Miranda reasoning capacity still showed no deficits as a result of attention difficulties. The remarkable
similarity between the findings for ADHD symptoms and VSAT performance raises the interesting hypothesis regarding whether deficits in Miranda comprehension are related to attentional issues in general, rather than a consequence specific to an ADHD diagnosis.

Table 9

*Effect of Current Attentional Impairment on Miranda Abilities*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Normal (≥ 17th) (n = 36)</th>
<th>Impaired (≤ 2nd) (n =56)</th>
<th>F</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSS Easy</td>
<td>67.4 19.4</td>
<td>65.6 17.4</td>
<td>.20</td>
<td>.10</td>
</tr>
<tr>
<td>MSS Moderate</td>
<td>60.8 15.3</td>
<td>53.5 16.6</td>
<td>4.44*</td>
<td>.45</td>
</tr>
<tr>
<td>MSS Difficult</td>
<td>53.1 13.5</td>
<td>49.2 12.9</td>
<td>1.99</td>
<td>.30</td>
</tr>
<tr>
<td>MSS Total</td>
<td>62.0 11.0</td>
<td>57.7 12.0</td>
<td>2.85*</td>
<td>.37</td>
</tr>
<tr>
<td>MSS Oral</td>
<td>60.3 13.8</td>
<td>53.8 12.5</td>
<td>5.45*</td>
<td>.50</td>
</tr>
<tr>
<td>MSS Written</td>
<td>64.4 11.4</td>
<td>62.5 14.4</td>
<td>.43</td>
<td>.14</td>
</tr>
<tr>
<td>MVS</td>
<td>82.76 19.98</td>
<td>75.20 18.84</td>
<td>3.20*</td>
<td>.39</td>
</tr>
<tr>
<td>MRS</td>
<td>17.14 2.28</td>
<td>16.41 3.05</td>
<td>1.51</td>
<td>.26</td>
</tr>
</tbody>
</table>

*Note.* MSS scores are reported as percentage correct.

* Significant at p <.05 for a directional hypothesis.

In order to compare the ability of ADHD symptomatology and current attentional impairment to predict Miranda comprehension, an additional analysis utilizing stepwise multiple regression was conducted with the MSS Total score as the dependent variable. Table 10 provides zero-order correlations and standardized beta coefficients for each
variable. A significant model resulted with DICA-R Total Symptoms and VSAT Total Percentile \( F (2, 91) = 4.252, p < .05 \), accounting for 8.5% of the variance. Interestingly, neither attention variable added significant predictive ability on its own. Rather, it was only the combination of the two variables that explained a significant proportion of the variance in MSS Total scores. This finding further indicates that an individual’s subjective report of ADHD symptoms may not provide a complete picture of their functioning, and underscores the importance of examining both aspects of attention.

Table 10

<table>
<thead>
<tr>
<th></th>
<th>Beta</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>DICA-R Total Symptoms</td>
<td>.180</td>
<td>.23</td>
<td>.09</td>
</tr>
<tr>
<td>VSAT Total Percentile</td>
<td>-.192</td>
<td>-.23</td>
<td>.07</td>
</tr>
</tbody>
</table>

Hypothesis 2

The second hypothesis proposed that the components of ADHD (inattention and impulsivity/hyperactivity) would evidence differential relationships with Miranda-related capacities. Specifically, inattention would be most strongly correlated with Miranda comprehension, while impulsivity/hyperactivity would be most strongly correlated with Miranda reasoning. Pearson’s correlations were used to examine relationships between the attention variables and scores on the MSS, MVS, and MRS (see Table 11).
Consistent with the hypothesis, inattention was most strongly correlated with Miranda comprehension (i.e., MSS and MVS scores). Although the relationships were not as strong, current attentional impairment, as measured by the VSAT, was also significantly correlated with MSS (Total and Oral) and MVS performance. The second component of this hypothesis was not supported. Specifically, impulsivity/hyperactivity was not significantly correlated with Miranda reasoning (i.e., MRS score). Although severity of impulsivity/hyperactivity evidenced a significant, yet small correlation with MSS Oral performance, these characteristics do not appear to have a marked effect on Miranda abilities overall.

Table 11

Correlations between the Attention and Miranda Variables

<table>
<thead>
<tr>
<th></th>
<th>MSS Total</th>
<th>MSS Oral</th>
<th>MSS Written</th>
<th>MVS</th>
<th>MRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DICA-R Total Score</td>
<td>-.27**</td>
<td>-.26**</td>
<td>-.23*</td>
<td>-.19*</td>
<td>.01</td>
</tr>
<tr>
<td>DICA-R Inattention Score</td>
<td>-.34**</td>
<td>-.30**</td>
<td>-.31**</td>
<td>-.24**</td>
<td>-.01</td>
</tr>
<tr>
<td>DICA-R Impulsivity Score</td>
<td>-.16</td>
<td>-.18*</td>
<td>-.11</td>
<td>-.12</td>
<td>.02</td>
</tr>
<tr>
<td>DICA-R Total Symptoms(\text{a})</td>
<td>-.22*</td>
<td>-.25**</td>
<td>-.16</td>
<td>-.18*</td>
<td>.03</td>
</tr>
<tr>
<td>DICA-R Inattention Symptoms(\text{a})</td>
<td>-.29**</td>
<td>-.30**</td>
<td>-.24**</td>
<td>-.24**</td>
<td>.03</td>
</tr>
<tr>
<td>DICA-R Impulsivity Symptoms(\text{a})</td>
<td>-.10</td>
<td>-.15</td>
<td>-.04</td>
<td>-.08</td>
<td>.02</td>
</tr>
<tr>
<td>VSAT Total Percentile</td>
<td>.22**</td>
<td>.27**</td>
<td>.13</td>
<td>.19*</td>
<td>.08</td>
</tr>
</tbody>
</table>

\(\text{a}\) Symptoms considered clinically relevant when rated as sometimes or always (\(\geq 3\)).

* Significant at \(p < .05\) for a directional hypothesis; ** Significant at \(p < .01\) for a directional hypothesis.
Substance Use

The second research question examined the impact of substance use on Miranda competencies. The Substance Use Inventory (SUI; Weiss et al., 1995), a measure of recent substance use, as well as the Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1998), an instrument to assess substance dependence and abuse, were included in the current study. Table 12 displays the descriptive data by gender for these substance use variables. On average, this sample of offenders reported using substances almost half of the time (3.20 days) in the week prior to the evaluation. A large number of offenders (33.9%) reported daily use of substances in the past week. The mean number of substance dependence symptoms reported for the total sample was 3.64, but ranged markedly from zero to 13 symptoms. It should be noted that gender differences were observed for the degree of substance use. Specifically, male offenders reported significantly more recent substance use than their female counterparts ($d = .60$). Moreover, males reported significantly more symptoms of Alcohol Abuse ($d = .60$) and Dependence ($d = .55$) than their female counterparts.
Table 12

**Descriptive Data for the Substance Use Variables by Gender**

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>Range</td>
<td>M</td>
<td>SD</td>
<td>Range</td>
</tr>
<tr>
<td>Total Days of Substance Use</td>
<td>3.63</td>
<td>3.08</td>
<td>0-7</td>
<td>1.82</td>
<td>2.78</td>
<td>0-7</td>
</tr>
<tr>
<td>Alcohol Abuse Symptoms</td>
<td>.46</td>
<td>.91</td>
<td>0-4</td>
<td>.00</td>
<td>.00</td>
<td>0</td>
</tr>
<tr>
<td>Drug Abuse Symptoms</td>
<td>.48</td>
<td>.95</td>
<td>0-3</td>
<td>.19</td>
<td>.68</td>
<td>0-3</td>
</tr>
<tr>
<td>Alcohol Dependence Symptoms</td>
<td>1.97</td>
<td>2.11</td>
<td>0-7</td>
<td>.86</td>
<td>1.60</td>
<td>0-6</td>
</tr>
<tr>
<td>Drug Dependence Symptoms</td>
<td>2.00</td>
<td>2.09</td>
<td>0-7</td>
<td>1.86</td>
<td>2.56</td>
<td>0-7</td>
</tr>
<tr>
<td>Total Dependence Symptoms</td>
<td>3.92</td>
<td>3.52</td>
<td>0-13</td>
<td>2.71</td>
<td>3.49</td>
<td>0-13</td>
</tr>
</tbody>
</table>

*Note. Substance abuse was only assessed when substance dependence criteria not met.*

* Significant at \( p < .05; \) ** Significant at \( p < .01.\)

In order to obtain a clearer picture of the substance use in this sample, descriptive data for the offenders’ preferred substance was also examined. Table 13 provides information regarding drug of choice and frequency of use within the past week for each substance based on the gender of the offender. For both male (38.9%) and female (32.1%) offenders, marijuana was preferred over all other substances. Alcohol was second for both males (15.6%) and females (17.9%). The third most-preferred substance differed based on gender of the offender. Specifically, male offenders then preferred cocaine (11.1%), whereas their female counterparts preferred stimulants (14.3%). These
findings suggest that soft drugs, such as marijuana and alcohol, are the primary drugs of choice, rather than hard drugs like cocaine and heroin.

Table 13

*Gender-based Descriptive Data for Each Type of Substance*

<table>
<thead>
<tr>
<th>Substance</th>
<th>Drug of Choice</th>
<th>Days of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>$n$ (%)</td>
<td>$n$ (%)</td>
</tr>
<tr>
<td>Alcohol</td>
<td>14 (15.6%)</td>
<td>5 (17.9%)</td>
</tr>
<tr>
<td>Marijuana</td>
<td>35 (38.9%)</td>
<td>9 (32.1%)</td>
</tr>
<tr>
<td>Cocaine</td>
<td>10 (11.1%)</td>
<td>2 (7.1%)</td>
</tr>
<tr>
<td>Stimulants</td>
<td>7 (7.8%)</td>
<td>4 (14.3%)</td>
</tr>
<tr>
<td>Heroin</td>
<td>2 (2.2%)</td>
<td>1 (3.6%)</td>
</tr>
<tr>
<td>Sedatives</td>
<td>2 (2.2%)</td>
<td>1 (3.6%)</td>
</tr>
<tr>
<td>Hallucinogens</td>
<td>1 (1.1%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

*Notes.* Percentages based on 90 males and 28 females.

A similar pattern emerged for frequency of use within the past week, with use of marijuana exceeding all other substances across gender. However, males ($M = 3.29$) acknowledged significantly higher use of marijuana than females ($M = 2.62; d = .64$). Male offenders ($M = 2.41$) also reported more frequent use of alcohol than their female counterparts ($M = .29; d = .87$). Interestingly, females ($M = 1.12$) reported higher use of stimulants than their male counterparts ($M = .14; d = .74$), but still only averaged about
one day of use in the past week. These data further indicate that the current sample reported use of mainly soft drugs. Very few (8.5%) reported frequent use (> 3 days) of hard drugs. Given the lack of variability in types of drugs used, the remaining analyses examined substance use as whole rather than by type of substance.

Current substance dependence and abuse diagnoses were determined using symptom endorsement from the MINI (Sheehan et al., 1998), which assesses alcohol and drug diagnoses separately. Participants were divided into three groups each for alcohol and drug use: Dependence (i.e., presence of three or more Dependence symptoms), Abuse (i.e., did not meet criteria for Dependence and reported at least one Abuse symptom), and No Diagnosis (i.e., did not meet criteria for Dependence or Abuse). As reported in table 14, nearly half of the sample (49.6%) met criteria for substance dependence, with 20 (16.9%) offenders evidencing both Alcohol and Drug Dependence. This is an important finding when considering the additive negative effects of polysubstance use (Lundqvist, 2005; Verdejo-Garcia et al., 2004). Interestingly, males were significantly more likely to meet criteria for substance use disorder diagnoses than their female counterparts ($\chi^2[2] = 11.17, p < .01$). This result is likely because male offenders reported more frequent use of substances than females in this sample. Conversely, 44 (37.6%) offenders did not meet criteria for any substance use disorder.
Table 14

Substance Use Diagnostic Classification by Type of Substance and Gender

<table>
<thead>
<tr>
<th></th>
<th>No Diagnosis</th>
<th></th>
<th>Abuse</th>
<th></th>
<th>Dependence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Total</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Alcohol</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Male</td>
<td>41 (46.6%)</td>
<td>24 (85.7%)</td>
<td>65 (56.0%)</td>
<td>15 (17.0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Drug</td>
<td>38 (44.7%)</td>
<td>19 (67.9%)</td>
<td>57 (50.4%)</td>
<td>12 (14.1%)</td>
<td>2 (7.1%)</td>
</tr>
<tr>
<td>Combined</td>
<td>26 (29.2%)</td>
<td>18 (64.3%)</td>
<td>44 (37.6%)</td>
<td>13 (14.6%)</td>
<td>2 (7.1%)</td>
</tr>
</tbody>
</table>

Note: Many individuals met diagnostic criteria for both alcohol and drug use disorders.

Combined = Alcohol and/or Drug.

Hypothesis 3

Considering the potential effects of substance intoxication or withdrawal, the third hypothesis proposed that recent substance use would significantly predict impairment in Miranda comprehension and reasoning ability. Therefore, each Miranda variable was analyzed with Total Days of Substance Use as a predictor variable. Surprisingly, recent substance use did not significantly predict performance on any of the Miranda measures when utilizing bivariate regression analyses (see Table 15).
Table 15

*Total Days of Substance Use as a Predictor of Miranda Comprehension and Reasoning*

<table>
<thead>
<tr>
<th></th>
<th>Beta</th>
<th>( R^2 )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSS Easy</td>
<td>-.014</td>
<td>.000</td>
<td>.88</td>
</tr>
<tr>
<td>MSS Moderate</td>
<td>.031</td>
<td>.001</td>
<td>.74</td>
</tr>
<tr>
<td>MSS Difficult</td>
<td>.058</td>
<td>.003</td>
<td>.54</td>
</tr>
<tr>
<td>MSS Total</td>
<td>-.044</td>
<td>.002</td>
<td>.64</td>
</tr>
<tr>
<td>MSS Average Oral</td>
<td>-.068</td>
<td>.005</td>
<td>.47</td>
</tr>
<tr>
<td>MSS Average Written</td>
<td>-.043</td>
<td>.002</td>
<td>.64</td>
</tr>
<tr>
<td>MVS Total Score</td>
<td>-.111</td>
<td>.012</td>
<td>.24</td>
</tr>
<tr>
<td>MRS Total Score</td>
<td>.077</td>
<td>.006</td>
<td>.41</td>
</tr>
</tbody>
</table>

An additional analysis was conducted with quartiles of the Total Days of Substance Use variable in order to obtain more well-defined groups of substance users. Participants in the first quartile reported zero days of substance use, whereas their fourth quartile counterparts reported seven days of substance use in the prior week. The relationship between recent substance use and Miranda abilities was examined using ANOVAs and Cohen’s \( d_s \). However, no significant group differences were found for degree of recent substance use on any of the Miranda abilities. Moreover, small effect sizes were observed for all measures (see Table 16).
Table 16

Comparison of Low and High Frequency Substance Use on Miranda-related Capacities

<table>
<thead>
<tr>
<th>Measure</th>
<th>0 days (n = 44)</th>
<th>7 days (n = 40)</th>
<th>F</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSS Easy</td>
<td>67.0 18.4</td>
<td>66.2 16.2</td>
<td>.04</td>
<td>.04</td>
</tr>
<tr>
<td>MSS Moderate</td>
<td>55.3 16.8</td>
<td>57.2 14.9</td>
<td>.28</td>
<td>.12</td>
</tr>
<tr>
<td>MSS Difficult</td>
<td>50.0 16.6</td>
<td>51.0 10.2</td>
<td>.12</td>
<td>.08</td>
</tr>
<tr>
<td>MSS Total</td>
<td>59.1 13.7</td>
<td>58.2 10.1</td>
<td>.14</td>
<td>.08</td>
</tr>
<tr>
<td>MSS Oral</td>
<td>56.6 14.8</td>
<td>54.8 12.1</td>
<td>.35</td>
<td>.13</td>
</tr>
<tr>
<td>MSS Written</td>
<td>62.6 14.9</td>
<td>61.6 11.1</td>
<td>.12</td>
<td>.08</td>
</tr>
<tr>
<td>MVS</td>
<td>80.93 23.08</td>
<td>74.49 16.55</td>
<td>2.00</td>
<td>.31</td>
</tr>
<tr>
<td>MRS</td>
<td>16.59 2.71</td>
<td>17.02 3.03</td>
<td>.48</td>
<td>.15</td>
</tr>
</tbody>
</table>

Note. MSS scores are reported as percentage correct.

Hypothesis 4

The fourth hypothesis proposed that defendants engaged in severe substance use that has caused significant functional impairment would demonstrate greater impairment in Miranda competencies than defendants not engaged in substance use. One-way between-subjects ANOVAs were conducted to determine differences between the groups on the Miranda measures; additionally, alcohol and drug use were examined separately. Tables 17 and 18 provide the F values and Cohen’s ds for each of the Miranda variables. Non-significant differences resulted between the groups for all MSS and MVS variables, regardless of type of substance. A significant difference was found for MRS scores;
however, this finding was contrary to the hypothesis; specifically, drug-dependent defendants evidenced somewhat better Miranda reasoning abilities.

Table 17

*Comparison of Non-Drinkers and Alcohol Dependent Groups on Miranda Abilities*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Non-Drinkers (n = 48)</th>
<th>Alcohol Dependent (n = 35)</th>
<th>F</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSS Easy</td>
<td>66.6 17.7</td>
<td>61.0 19.0</td>
<td>1.87</td>
<td>.30</td>
</tr>
<tr>
<td>MSS Moderate</td>
<td>55.8 19.7</td>
<td>53.7 16.2</td>
<td>.27</td>
<td>.12</td>
</tr>
<tr>
<td>MSS Difficult</td>
<td>48.2 17.4</td>
<td>48.3 9.9</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>MSS Total</td>
<td>58.0 14.5</td>
<td>56.5 10.8</td>
<td>.26</td>
<td>.11</td>
</tr>
<tr>
<td>MSS Oral</td>
<td>55.1 15.8</td>
<td>53.0 13.0</td>
<td>.43</td>
<td>.15</td>
</tr>
<tr>
<td>MSS Written</td>
<td>61.4 16.0</td>
<td>61.1 12.3</td>
<td>.01</td>
<td>.02</td>
</tr>
<tr>
<td>MVS</td>
<td>76.83 25.50</td>
<td>79.06 19.25</td>
<td>.18</td>
<td>.09</td>
</tr>
<tr>
<td>MRS</td>
<td>16.13 2.59</td>
<td>16.97 3.19</td>
<td>1.78</td>
<td>.30</td>
</tr>
</tbody>
</table>

*Note.* MSS scores are reported as percentage correct.
Table 18

Comparison of Non-Users and Drug Dependent Groups on the Miranda Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Non-Users (n = 42)</th>
<th>Drug Dependent (n = 42)</th>
<th>F</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSS Easy</td>
<td>64.9 19.8</td>
<td>63.3 14.7</td>
<td>.17</td>
<td>.09</td>
</tr>
<tr>
<td>MSS Moderate</td>
<td>53.9 17.1</td>
<td>52.2 17.5</td>
<td>.21</td>
<td>.10</td>
</tr>
<tr>
<td>MSS Difficult</td>
<td>48.9 16.7</td>
<td>48.9 13.5</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>MSS Total</td>
<td>58.0 14.0</td>
<td>56.2 11.8</td>
<td>.37</td>
<td>.13</td>
</tr>
<tr>
<td>MSS Oral</td>
<td>55.1 15.5</td>
<td>53.8 13.2</td>
<td>.17</td>
<td>.09</td>
</tr>
<tr>
<td>MSS Written</td>
<td>61.9 15.8</td>
<td>59.4 12.7</td>
<td>.61</td>
<td>.17</td>
</tr>
<tr>
<td>MVS</td>
<td>75.33 23.41</td>
<td>75.34 22.35</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>MRS</td>
<td>15.95 2.74</td>
<td>17.05 2.87</td>
<td>3.20*</td>
<td>.39</td>
</tr>
</tbody>
</table>

Note. MSS scores are reported as percentage correct.

* Significant at $p < .05$ for a directional hypothesis.

As a supplementary analysis, Miranda-related abilities were examined in relation to quartile, rather than diagnostic, groups for total substance dependence symptoms from the MINI. ANOVAs were used to compare participants that reported zero dependence symptoms with their counterparts who reported at least seven dependence symptoms on measures of Miranda-related abilities. Significant differences were still not observed for scores on any of the MSS or MVS variables (see Table 19). Similar to the previous analysis, defendants reporting more substance dependence symptoms demonstrated better Miranda reasoning abilities.
Table 19

Comparison of Low and High Total Dependence Symptoms on Miranda Competencies

<table>
<thead>
<tr>
<th>Measure</th>
<th>0 symptoms (n = 30)</th>
<th>≥ 7 symptoms (n = 22)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MSS Easy</td>
<td>64.4 16.2</td>
<td>64.6 11.8</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>MSS Moderate</td>
<td>52.7 18.9</td>
<td>52.1 14.7</td>
<td>.01</td>
<td>.03</td>
</tr>
<tr>
<td>MSS Difficult</td>
<td>47.8 18.3</td>
<td>49.5 13.1</td>
<td>.14</td>
<td>.11</td>
</tr>
<tr>
<td>MSS Total</td>
<td>56.5 15.0</td>
<td>57.1 11.1</td>
<td>.02</td>
<td>.04</td>
</tr>
<tr>
<td>MSS Oral</td>
<td>54.0 16.4</td>
<td>54.0 12.4</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>MSS Written</td>
<td>60.0 17.2</td>
<td>60.9 12.2</td>
<td>.05</td>
<td>.06</td>
</tr>
<tr>
<td>MVS</td>
<td>79.36 26.75</td>
<td>77.36 20.83</td>
<td>.08</td>
<td>.08</td>
</tr>
<tr>
<td>MRS</td>
<td>16.07 2.69</td>
<td>17.41 2.92</td>
<td>2.94*</td>
<td>.48</td>
</tr>
</tbody>
</table>

Note. MSS scores are reported as percentage correct.

* Significant at p < .05 for a directional hypothesis.

Hypothesis 5

The fifth hypothesis predicted that severity of substance use (i.e., total substance dependence symptoms) would better predict deficits in Miranda abilities than recency of substance use (i.e., total days of substance use in past week). Hierarchical multiple regressions were conducted to examine the predictive relationship of MINI Total Dependence Symptoms and SUI Total Days of Substance Use on MSS, MVS, and MRS Total scores. The substance use variables were entered into the equation in both orders to
identify the unique contribution of each variable. Tables B.1, B.2, and B.3 in Appendix B display the partial correlations, standardized beta coefficients, and Adjusted $R^2$ for each predictor variable with the MSS Total score, MVS Total score, and the MRS Total score, respectively. The overall relationship was not significant for the MSS Total Percentile $[F (2, 113) = .705, p = .50]$, MVS Total Score $[F (2, 109) = 1.178, p = .31]$, or MRS Total Score $[F (2, 115) = 1.171, p = .31]$. As a supplementary analysis, the relationships between the substance use variables and MSS, MVS, and MRS scores were examined through point-biserial correlations (see Table 20). The scores on all Miranda variables were divided into two groups, good ($\geq 70$ percent) versus poor ($< 50$ percent) performance, based on criteria used in previous research (Rogers et al., 2007). Correlations with most of the substance use variables were small and non-significant. However, when excluding individuals reporting only alcohol and/or marijuana use from this analysis, a significant relationship was seen with both MSS and MVS performance. The current results also indicate that overall severity of substance use, as measured by dependency on the MINI, has a significant relationship with Miranda comprehension. Because the number of defendants dependent on hard substances was too small, these analyses include defendants that are dependent on any type of substance.
Table 20

*Point-biserial Correlations between Substance Use and Miranda Performance*

<table>
<thead>
<tr>
<th></th>
<th>MSS Total</th>
<th>MSS Oral</th>
<th>MSS Written</th>
<th>MVS</th>
<th>MRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Days of Any Substance Use</td>
<td>.15</td>
<td>.15</td>
<td>.06</td>
<td>.20</td>
<td>.01</td>
</tr>
<tr>
<td>Total Days of Hard Substance Use</td>
<td>.29*</td>
<td>.23*</td>
<td>.01</td>
<td>.24*</td>
<td>-.08</td>
</tr>
<tr>
<td>Total Dependence Symptoms</td>
<td>.25*</td>
<td>.15</td>
<td>.08</td>
<td>.06</td>
<td>-.14</td>
</tr>
<tr>
<td>Alcohol Dependence Symptoms</td>
<td>.17</td>
<td>.15</td>
<td>.06</td>
<td>.03</td>
<td>-.16</td>
</tr>
<tr>
<td>Drug Dependence Symptoms</td>
<td>.21</td>
<td>.10</td>
<td>.07</td>
<td>.07</td>
<td>-.08</td>
</tr>
</tbody>
</table>

*Note.* MSS, MVS, and MRS scores were categorized into good and poor performance.

* Significant at $p < .05$ for a directional hypothesis.

Competing Hypotheses

*Hypothesis 6*

The sixth hypothesis indicated that attention variables (i.e., VSAT scores and ADHD symptoms) and substance use variables (i.e., recent substance use and substance dependence symptoms) would remain significant predictors of impairment in Miranda competencies, when considering the effects of both cognitive variables (i.e., FSIQ, and reading and listening comprehension) and psychological impairment (i.e., GAS score and SADS-C subscale scores). Hierarchical multiple regressions were conducted separately for attention and substance use variables to examine the incremental predictive ability of these independent variables on MSS, MVS, and MRS scores.
When examining MSS performance, the overall relationship was significant for both attention \( F(9, 83) = 4.867, p < .001 \) and substance use variables \( F(9, 104) = 4.745, p < .001 \) when cognitive and psychological variables were included. However, attention \( (\Delta R^2 = .006) \) and substance use variables \( (\Delta R^2 = .001) \) contributed virtually no predictive power to the overall models. Similar results were seen for MVS performance. Specifically, significant models resulted for both attention \( F(9, 81) = 7.051, p < .001 \) and substance use variables \( F(9, 100) = 9.642, p < .001 \); however, the attention \( (\Delta R^2 = .007) \) and substance use variables \( (\Delta R^2 = .04) \) again added little predictive ability in the models. For MRS scores, the overall relationship was not significant for either the attention \( F(9, 84) = 1.277, p = .26 \) or substance use model \( F(9, 106) = 1.504, p = .16 \). Given these results, it appears that this hypothesis was not supported.

In order to examine which independent variables were predictive of Miranda-related competencies, supplementary analyses utilizing stepwise multiple regressions were conducted with MSS, MVS, and MRS scores. For the MSS, two variables produced a significant model \( F(2, 90) = 22.151, p < .001 \), and accounted for 33.0% of the total variance. As illustrated in Table 21, only FSIQ and GAS score were significantly associated with MSS scores when the other variables were held constant.
Table 21

Summary of Stepwise Regression Analysis for Variables Predicting MSS Total Scores

<table>
<thead>
<tr>
<th></th>
<th>$R^2$</th>
<th>$r$</th>
<th>Beta</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.21</td>
<td>.46</td>
<td>.462</td>
<td>.00</td>
</tr>
<tr>
<td>FSIQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.33</td>
<td>.46</td>
<td>.421</td>
<td>.00</td>
</tr>
<tr>
<td>FSIQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAS score</td>
<td></td>
<td>.39</td>
<td>.344</td>
<td>.00</td>
</tr>
</tbody>
</table>

When examining only performance on orally-administered MSS warnings, the overall relationship was significant [$F (2, 90) = 14.592, p < .001$], and accounted for 24.5% of the variance. The same two variables again entered the model: FSIQ and GAS Score. Table 22 provides the partial correlation and standardized beta coefficient for each predictor variable included in the model.

Table 22

Stepwise Regression Analysis for Variables Predicting MSS Oral Scores

<table>
<thead>
<tr>
<th></th>
<th>$R^2$</th>
<th>$r$</th>
<th>Beta</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.16</td>
<td>.40</td>
<td>.403</td>
<td>.00</td>
</tr>
<tr>
<td>FSIQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.25</td>
<td>.39</td>
<td>.369</td>
<td>.00</td>
</tr>
<tr>
<td>FSIQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAS score</td>
<td></td>
<td>.31</td>
<td>.289</td>
<td>.00</td>
</tr>
</tbody>
</table>
Very similar to oral advisements, the overall model for MSS performance on written warnings was significant \( F (2, 90) = 18.985, p < .001 \) and accounted for 29.7% of the total variance, with GAS Score and FSIQ entering the regression (see Table 23). Contrary to assumptions, psychological impairment provided more predictive ability than intelligence.

Table 23

*Stepwise Regression Analysis for Variables Predicting MSS Written Scores*

<table>
<thead>
<tr>
<th></th>
<th>( R^2 )</th>
<th>( r )</th>
<th>Beta</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.17</td>
<td>.42</td>
<td>.416</td>
<td>.00</td>
</tr>
<tr>
<td>GAS score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.30</td>
<td>.40</td>
<td>.374</td>
<td>.00</td>
</tr>
<tr>
<td>GAS score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSIQ</td>
<td></td>
<td>.39</td>
<td>.355</td>
<td>.00</td>
</tr>
</tbody>
</table>

Given the strong relationship between comprehension of Miranda statements and intellectual functioning, supplementary analyses considering the effects of FSIQ were conducted. Stepwise multiple regressions were utilized to examine whether attention (i.e., VSAT scores and ADHD symptoms) and substance use (i.e., SUI Total Days and Total Dependence Symptoms) variables significantly predicted performance on the MSS when the sample was restricted to one of two groups: (a) below average intelligence (FSIQ < 90); or (b) average to above average intelligence (FSIQ ≥ 90). Different predictors resulted based on level of intelligence. Specifically, for defendants with below average
intelligence, only number of ADHD symptoms (Beta = -.290) significantly predicted comprehension of Miranda statements \( F (1, 45) = 4.135, p < .05 \), accounting for 8.4% of the total variance. Conversely, current attentional impairment as measured by the VSAT (Beta = .339) was the only significant predictor for defendants with average to above average intelligence \( F (1, 44) = 5.705, p < .05 \), accounting for 11.5% of the total variance.

For the MVS, the overall relationship was significant \( F (3, 87) = 21.201, p < .001 \), and accounted for 42.2% of the variance. Three variables entered the model: FSIQ, SADS-C Psychosis, and WIAT Reading Comprehension. See Table 24 for partial correlations and standardized beta coefficients for each predictor variable.

Table 24

<table>
<thead>
<tr>
<th></th>
<th>( R^2 )</th>
<th>( r )</th>
<th>Beta</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.33</td>
<td>.58</td>
<td>.577</td>
<td>.00</td>
</tr>
<tr>
<td>FSIQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.39</td>
<td>.57</td>
<td>.550</td>
<td>.00</td>
</tr>
<tr>
<td>FSIQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SADS-C Psychotic</td>
<td>- .29</td>
<td>-.240</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>.42</td>
<td>.32</td>
<td>.364</td>
<td>.00</td>
</tr>
<tr>
<td>FSIQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SADS-C Psychotic</td>
<td>-.26</td>
<td>-.207</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>WIAT Reading Comprehension</td>
<td>.23</td>
<td>.264</td>
<td>.03</td>
<td></td>
</tr>
</tbody>
</table>
The overall model for the MRS was significant \( F(2, 91) = 4.936, p < .01 \) and accounted for 9.8% of the total variance, with Total Dependence Symptoms and WIAT Listening Comprehension entering the regression (see Table 25). Notably, substance dependence and defendants’ listening skills were more predictive of Miranda reasoning ability than other cognitive and psychological variables. These data contradict the majority of Miranda research, which emphasizes intellectual functioning and severe psychological impairment.

Table 25

*Summary of Stepwise Regression Analysis for Variables Predicting MRS Total Scores*

<table>
<thead>
<tr>
<th>Step</th>
<th>( R^2 )</th>
<th>( r )</th>
<th>Beta</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Dependence Symptoms</td>
<td>.23</td>
<td>.229</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Dependence Symptoms</td>
<td>.24</td>
<td>.230</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>WIAT Listening Comprehension</td>
<td>.22</td>
<td>.213</td>
<td>.04</td>
<td></td>
</tr>
</tbody>
</table>

Psychological Vulnerabilities Model

*Hypothesis 7*

A principal axis factor (PAF) analysis with varimax rotation, using SPSS Windows (V. 11.5) software, was conducted to identify the underlying dimensions associated with Miranda-related competencies. The following variables were included in
the factor analysis: SUI Total Days, MINI Total Dependence Symptoms, VSAT Total Percentile, DICA-R Total Score, GAS, VIQ, FSIQ, Listening Comprehension, and Reading Comprehension. Pedhazur and Schmelkin’s (1991) recommendation of over-factoring and under-factoring was used in determining the best solution.

As illustrated in Table 26, a three-factor solution best describes the underlying factor structure of the Miranda-related variables, and is superior to two- and four-factor models. The three-factor solution accounted for 70.9% of the total variance, and interpretability of the model is comparable with the Psychological vulnerabilities model (Gudjonsson, 2003). The three factors are presented:

- **Factor 1, Cognitive Functioning** (37.1% of the variance), is composed of four variables with loadings that range from .69 to .92. Three of the strongest loadings in the model consisted of intellectual functioning, including both overall abilities and verbal skills, and reading achievement. Listening comprehension skills also contributed a robust loading.

- **Factor 2, Substance Use** (22.3% of the variance), has two unique loadings on frequency of recent substance use and number of substance dependence symptoms. Although both situational and long-term impairment as a result of alcohol and drug use characterize this factor, the highest factor loading was evidenced by frequency of recent substance use (.80), followed by severity of substance-related impairment (.64). Therefore, this factor appears to be most consistent with the Abnormal Mental States domain of Gudjonsson’s (2003)
model. Surprisingly, current attentional impairment (i.e., VSAT Total Percentile) did not load on this or any factor.

- Factor 3, *Psychological Functioning* (11.5% of the variance), considers mental disorders and related functional impairment. Two variables loaded uniquely and substantially onto the third factor, with loadings of -.79 (GAS) and .60 (DICA-R Total Score). This factor includes overall psychological impairment and severity of ADHD symptoms. These variables are consistent with more chronic psychological conditions than the relatively transient states noted in Factor 2. The two-factor solution accounted for only 59.4% of the total variance, and consisted of a factor containing the four cognitive variables and a second factor that included both psychological and mental state variables. The three-factor solution provided a better fit for the data because it was more interpretable and accounted for substantially more variance than the two-factor model. The four-factor model was not a viable solution because the fourth factor had no unique loadings and could not be considered an independent factor.
Table 26

*Three-Factor Model of Miranda Variables Using PAF Analysis with Varimax Rotation*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASI VIQ</td>
<td>.92</td>
<td>- .03</td>
<td>.07</td>
</tr>
<tr>
<td>WASI FSIQ</td>
<td>.89</td>
<td>.05</td>
<td>.10</td>
</tr>
<tr>
<td>WIAT Reading Comprehension</td>
<td>.82</td>
<td>- .11</td>
<td>.21</td>
</tr>
<tr>
<td>WIAT Listening Comprehension</td>
<td>.69</td>
<td>.07</td>
<td>.12</td>
</tr>
<tr>
<td>SUI Total Days</td>
<td>.09</td>
<td>.80</td>
<td>- .00</td>
</tr>
<tr>
<td>MINI Total Dependence Symptoms</td>
<td>.01</td>
<td>.64</td>
<td>- .27</td>
</tr>
<tr>
<td>VSAT Total Percentile</td>
<td>.10</td>
<td>- .26</td>
<td>.24</td>
</tr>
<tr>
<td>DICA-R Total Score</td>
<td>-.16</td>
<td>.04</td>
<td>-.79</td>
</tr>
<tr>
<td>GAS</td>
<td>.11</td>
<td>-.29</td>
<td>.60</td>
</tr>
</tbody>
</table>

Eigenvalues: 3.34
<table>
<thead>
<tr>
<th>% of Variance Accounted For</th>
</tr>
</thead>
<tbody>
<tr>
<td>37.1</td>
</tr>
<tr>
<td>22.3</td>
</tr>
<tr>
<td>11.5</td>
</tr>
</tbody>
</table>

*Note.* Substantial loadings (> .40) are presented in bold.

As a supplementary analysis, the relationships between the Miranda-related variables that were included in the exploratory factor analysis (EFA) and scores on the MSS, MVS, and MRS were examined through Pearson’s correlations (see Table 27). Intelligence and academic achievement demonstrated small to moderate relationships ($r_s$ range from .21 to .39) with defendants’ ability to paraphrase Miranda statements. Even stronger correlations ($r_s$ range from .52 to .62) were found between the cognitive variables and Miranda vocabulary ability. These findings may be related to the skills
needed to successfully complete each task. Specifically, the MSS requires more verbal reasoning and concentration than the MVS, which relies most heavily on word knowledge and education. Interestingly, cognitive abilities evidenced little relationship with Miranda reasoning ability. Moreover, very small correlations were found between the substance use variables and all of the Miranda measures. Regarding psychological variables, overall psychological functioning (i.e., GAS) evidenced stronger relationships (rs range from .20 to .42) with the MSS and MVS than severity of ADHD symptoms (rs range from -.19 to -.27). Although current attention deficits (i.e., VSAT) did not load onto any factor in the EFA, significant but small correlations (rs range from .19 to .27) were found for MSS and MVS performance. This finding may further signify the importance of considering defendants’ mental status at the time of the Miranda waiver.

Table 27

*Correlations between the EFA Variables and Miranda Performance*

<table>
<thead>
<tr>
<th></th>
<th>MSS Total</th>
<th>MSS Oral</th>
<th>MSS Written</th>
<th>MVS</th>
<th>MRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASI VIQ</td>
<td>.39**</td>
<td>.34**</td>
<td>.35**</td>
<td>.62**</td>
<td>.10</td>
</tr>
<tr>
<td>WASI FSIQ</td>
<td>.39**</td>
<td>.37**</td>
<td>.32**</td>
<td>.56**</td>
<td>.13</td>
</tr>
<tr>
<td>WIAT Reading Comprehension</td>
<td>.38**</td>
<td>.36**</td>
<td>.31**</td>
<td>.58**</td>
<td>.10</td>
</tr>
<tr>
<td>WIAT Listening Comprehension</td>
<td>.29**</td>
<td>.30**</td>
<td>.21**</td>
<td>.52**</td>
<td>.22*</td>
</tr>
<tr>
<td>SUI Total Days</td>
<td>-.04</td>
<td>-.07</td>
<td>-.04</td>
<td>-.11</td>
<td>.08</td>
</tr>
<tr>
<td>MINI Total Dependence Symptoms</td>
<td>-.11</td>
<td>-.10</td>
<td>-.11</td>
<td>.02</td>
<td>.14</td>
</tr>
<tr>
<td>DICA-R Total Score</td>
<td>-.27**</td>
<td>-.26**</td>
<td>-.23**</td>
<td>-.19*</td>
<td>.01</td>
</tr>
<tr>
<td>GAS</td>
<td>.39**</td>
<td>.31**</td>
<td>.42**</td>
<td>.20*</td>
<td>.15</td>
</tr>
</tbody>
</table>

** Significant at p < .01; * Significant at p < .05 for directional hypotheses.
CHAPTER 4
DISCUSSION

An estimated 318,000 impaired defendants participate in police interrogations without a knowing waiver of their Miranda rights each year (Rogers, 2008). When the number of defendants lacking an intelligent waiver is added to this estimate, the number of defendants who are providing incriminating evidence to police without a valid waiver of their Miranda rights increases exponentially (Rogers). Considering that a defendant’s confession is likely the “single most influential factor” in a subsequent guilty verdict at trial (Oberlander et al., 2003, p. 335), Miranda-related competencies are arguably one of the most crucial pretrial issues. However, the validity of Miranda waivers goes unexamined in nearly all confession cases (Fulero & Everington, 1995).

Not ensuring a Miranda waiver is valid before a police interrogation can lead to false confessions and the unwarranted confinement of innocent persons (Rogers, Shuman, & Drogin, 2008). Moreover, when Miranda waiver issues are successfully raised during the trial process, the exclusion of confessions can affect the outcome of the trial. For instance, a manslaughter conviction of an adolescent in Florida was overturned based on an insufficient Miranda warning. His statement was deemed inadmissible because the scripted Miranda warning only informed him that he could consult an attorney before questioning but failed to inform him that he could consult one during questioning as well (Roberts v. Florida, 2004). Therefore, it is in the best interest of both the defense and
prosecution to ensure both the accuracy of the Miranda warnings and that Miranda waivers are made knowingly, intelligently, and voluntarily.

Totality of the Circumstances

In *Moran v. Burbine* (1986, p. 421), the court affirmed that “only if the totality of the circumstances surrounding the interrogation reveals both an uncoerced choice and the requisite level of comprehension may a court properly conclude that the *Miranda* rights have been waived.” The validity of a Miranda waiver is determined utilizing this type of approach (*Coyote v. U.S.*, 1967; *Fare v. Michael C.*, 1979; *Miranda v. Arizona*, 1966), which requires an examination of the individual characteristics of each case. The court stated in *Coyote v. U.S.* (1967) that the age, background, and intelligence of the defendant should be considered when determining their capacity to waive Miranda rights.

Expanding on available case law, researchers (Grisso, 2003; Gudjonsson, 2003; Oberlander et al., 2003) outlined several additional issues that the court may consider when determining the validity of a Miranda waiver. For example, Oberlander and colleagues identified verbal abilities and mental disorders as crucial variables to include when examining Miranda-related capacities. Moreover, both Grisso and Gudjonsson additionally recognized situational factors at the time of the waiver (e.g., police procedures, intoxication, and physical illness) as important issues to evaluate. However, most research on the assessment of Miranda waivers emphasizes cognitive and developmental issues to the exclusion of psychological and situational factors (Rogers, 2008). This disparity is also found in the clinical practice of forensic psychologists (see Ryba et al., 2007, p. 306). Specifically, the most common psychological measures used in
Miranda waiver evaluations assessed intelligence, achievement, and reading, with 10% or fewer of Miranda practitioners utilizing measures of psychopathology.

Recent investigations (Cooper, 2005; Rogers, Harrison, Hazelwood, et al., 2007) underscore the importance of evaluating Axis I disorders and overall psychological impairment when assessing Miranda-related abilities. Interestingly, two of the more prevalent Axis I disorders found in correctional populations, attention deficit-hyperactivity disorder (ADHD) and substance dependence, were excluded from these studies. Not only do these disorders present as chronic conditions that affect overall psychological impairment, but related factors may contribute to the defendant’s impaired mental state at the time of the Miranda waiver. Specifically, defendants may experience severe stress and anxiety related to their current environment (e.g., jail) and circumstances (e.g., arrest and pre-interrogation; Gudjonsson, 2003), which may lead to detriments in their attentional abilities. Moreover, suspects are frequently intoxicated at the time of arrest and subsequent interrogation (Davison & Forshaw, 1993; Gudjonsson; Weiss, 2003). In light of these issues, the present study investigated the impact of chronic and situational factors related to attention deficits and substance use on Miranda-related abilities. This chapter discusses the psychological vulnerabilities model (Gudjonsson) and implications for clinical practice in light of the current findings.

*Psychological Vulnerabilities Model*

Considering the totality of circumstances approach discussed above, Gudjonsson (2003) outlined the psychological vulnerabilities that should be taken into account in a comprehensive evaluation of Miranda waivers and subsequent confessions. His model
highlighted four domains of functioning that could affect suspects’ ability to provide a valid Miranda waiver and confession: (a) cognitive functioning, (b) mental disorders, (c) abnormal mental states, and (d) personality traits. The current study evaluated the first three domains of his model and their relation to Miranda-related abilities.

An exploratory factor analysis of the cognitive, psychological, and mental state variables utilized in the present study mostly supported Gudjonsson’s psychological vulnerabilities model. Specifically, three factors emerged that explained 70.9% of the variance, with very strong factor loadings ranging from .60 to .92. The Cognitive Functioning factor accounted for the most variance, followed by Substance Use and then Psychological Functioning. Past Miranda research (Harrison, 2007; Rogers, Harrison, Hazelwood, et al., 2007) identified the importance of cognitive abilities followed by psychological functioning when examining Miranda comprehension and reasoning with mentally-disordered defendants. Notably, the current study maintained the significance of cognitive functioning when assessing a sample of recently arrested defendants.

An unexpected finding of the present study was that current attentional impairment, as measured by the Visual Search and Attention Test (VSAT), did not load onto any factor. It was hypothesized that this variable would load onto a factor with other mental state variables, such as recent intoxication. Instead, that factor was composed of the two substance use variables from the Substance Use Inventory (SUI) and Mini International Neuropsychiatric Interview (MINI). This finding makes sense when considering the strong relationship ($r = .51$) between substance dependence and recent substance use. Although current attentional impairment was significantly correlated with
recent substance use, the magnitude of this relationship \((r = -.19)\) was much smaller than with substance dependence. It is possible that the mental state variables are better conceptualized as separate factors. The three domains evaluated in the present study are discussed with regards to current findings.

**Cognitive Functioning**

The majority of past Miranda research examining the effect of cognitive functioning on Miranda abilities (Bishop, 1990; Clare & Gudjonsson, 1995; Everington & Fulero, 1999) has focused on individuals with mental retardation. Severe deficits in intellectual functioning have consistently been shown to have a profound impact on Miranda comprehension when using Grisso’s (1998) measures. Specifically, Bishop found that intelligence accounted for a substantial proportion of the variance \((R^2 = .71)\) in Miranda comprehension in a juvenile sample of educable mentally retarded students. Everington and Fulero broadened this research by evaluating a group of adult probationers. Defendants with mental retardation evidenced significantly decreased Miranda comprehension when compared to their non-mentally retarded counterparts \((d = 1.57)\). By utilizing effect size conversions, it appears that the effect size found in Bishop is double that found in Everington and Fulero. Differences in sample characteristics between the two studies may explain this disparity. Specifically, Bishop utilized a sample of juveniles who did not necessarily have a criminal history, whereas Everington and Fulero’s sample was comprised of adults who were on probation. The combination of age and experience in the criminal justice system may have decreased the magnitude of the relationship between mental retardation and Miranda comprehension.
Importantly, neither of these studies examined the effect of mental retardation on Miranda reasoning ability. With regard to this topic, Clare and Gudjonsson (1995) found that individuals with mental retardation showed substantial deficits in their ability to appreciate the purpose of the Miranda rights. For example, mentally retarded individuals were less likely to believe they should seek legal advice before an interrogation and more likely to believe they could retract any statement they made to police than individuals with average intelligence.

Interestingly, limited research has examined the relationship between intellectual abilities and Miranda competencies in individuals without mental retardation. In his early work, Grisso (1981; 1998) concluded that differences in Miranda comprehension among juveniles and adults were primarily due to differences in intelligence, regardless of whether the individuals were mentally retarded. On this point, Gudjonsson (2003) reported that “limited intellectual abilities, not amounting to learning disability, can influence the ability of suspects to understand questions, articulate their answers, and appreciate the implications of their answers” (p. 319). Approximately half of the current sample was comprised of defendants with at least average intellectual functioning (49.6%), with very few (< 5%) obtaining scores in the mentally retarded range. Even in a sample consisting of mostly below average to average functioning offenders, overall intellectual functioning was a significant predictor of Miranda comprehension ($R^2$'s range from .16 to .33), as measured by the Miranda Statements Scale (MSS; Rogers, 2005) and Miranda Vocabulary Scale (MVS; Rogers, 2006b). Moreover, the magnitude of the relationship between IQ and performance on the Miranda instruments ranged from
medium to large ($r$s from .32 to .56). Although research with mentally retarded individuals (Bishop, 1990; Everington & Fulero, 1999) evidenced larger effect sizes than those found with less impaired individuals, results of the current study implicate the importance of considering level of intelligence even when mental retardation is not suspected. In contrast to Clare and Gudjonsson (1995), IQ evidenced no relationship with Miranda reasoning ability, as measured by the Miranda Rights Scale (MRS; Rogers, 2006a), in the current sample. It appears that other factors, such as substance dependence, are better predictors of the ability to consider reasons to waive or exercise Miranda rights in defendants without severe intellectual deficits.

Beyond intellectual functioning, it is also important to consider the impact of specific verbal abilities on Miranda-related capacities. Both listening and reading comprehension, as measured by the Wechsler Individual Achievement Test – 2$^{nd}$ Ed. (WIAT-II), have been identified as important factors to consider in Miranda waiver evaluations in past research (Harrison, 2007; Osman, 2005). Regarding listening comprehension, Osman found it was a strong predictor of Miranda abilities when using Grisso’s (1998) measures with juvenile offenders, but only on the FRI subtest. In a sample of mentally-disordered offenders, Harrison similarly found that listening comprehension added predictive ability of Miranda reasoning, as measured by the MRS, but not Miranda comprehension.

In the current study, the magnitude of the relationship between listening comprehension and performance on the MSS and MVS ranged from small to large ($r$s from .21 to .52); however, listening skills did not emerge as a significant predictor of
Miranda comprehension. On the other hand, listening comprehension did significantly predict a defendant’s ability to reason about their rights on the MRS. These findings are consistent with those found in the studies by Harrison (2007) and Osman (2005). One similarity between the FRI and MRS is that they both go beyond basic understanding of the Miranda rights to assess defendants’ ability to appreciate and utilize the rights in an interrogation setting. Based on these studies, it appears that listening comprehension may not have a direct impact on defendants’ capacity to comprehend the Miranda warnings. However, deficits in listening ability may negatively affect defendants’ capacity to grasp the function of the warnings and effectively use that information when making decisions regarding the Miranda waiver.

When examining reading comprehension, Harrison (2007) found that it was the only variable to significantly discriminate between participants with good and poor understanding on the MSS ($d = 1.01$) and significantly predicted MSS scores at the highest reading levels (i.e., grades 10 to 11.9 and $\geq 12$). Findings in the present study revealed medium to large relationships ($r$s range from .31 to .58) between reading comprehension skills and Miranda understanding, as measured by the MSS and MVS. Furthermore, reading comprehension was a significant predictor of a defendant’s ability to comprehend Miranda vocabulary ($r = .23$) when considering other cognitive and psychological factors. These findings are in contrast to results by Osman (2005), which revealed no relationship between reading ability and Miranda comprehension. However, distinct methodological differences may explain this discrepancy. First, Osman utilized Grisso’s (1998) measures, which require little to no reading and place more emphasis on
the capacity to listen to the examiner. Conversely, the instruments used by Harrison and the present study involve reading of approximately half of the presented Miranda warnings. Moreover, Osman used a sample of juveniles that likely demonstrate marked differences from Harrison’s sample of mentally-disordered offenders and the current group of recently arrested adult defendants. Given the differences between these studies, it appears that reading ability is essential to Miranda comprehension in adult defendants when they are required to read the warning, especially in jurisdictions using more complex warnings.

The current findings underscore the importance of considering both listening and reading comprehension in Miranda waiver evaluations. While reading abilities appear to have an important effect on Miranda comprehension, listening skills seem to be crucial for ensuring defendants can grasp the significance of the Miranda warnings. However, only about one-third of Miranda practitioners utilize academic achievement instruments in their Miranda waiver evaluations (Ryba et al., 2007). Therefore, reading and listening comprehension should be emphasized more in both Miranda research and clinical practice.

*Mental Disorders*

A defendant’s appreciation of their Miranda rights and the consequences of a waiver of these rights can be greatly impaired by mental disorders. Rogers and Shuman (2005) suggested that “intelligent waivers require that suspects be free from psychotic interference that markedly impair the decisional process” (p. 128). Past research with psychiatric inpatients found that severe Axis I symptomatology significantly predicted
comprehension of Miranda warnings beyond the effect of cognitive functioning (Cooper; 2005), with the combination of IQ and psychiatric symptoms accounting for 44 to 53% of the total variance. Similarly, Rogers, Harrison, Hazelwood, et al. (2007) noted widespread difficulties in understanding Miranda warnings among offenders diagnosed with severe Axis I disorders. Moreover, general functional impairment and psychiatric symptoms emerged as important predictors of Miranda comprehension, accounting for 17% of the variance. Both of these samples were comprised of individuals with serious psychological impairment and a high prevalence of psychotic symptoms.

Although these studies provide valuable contributions to Miranda research, prevalence studies show that the typical criminal defendant is unlikely to evidence such severe symptomatology, with less than 3% currently diagnosed with Schizophrenia (Teplin, 1994; Teplin, Abram, & McClelland, 1996). Consistent with Teplin and colleagues, psychotic symptoms were rarely observed in the present sample of recently arrested defendants, and only 3.4% obtained GAS scores in the severe range. Although the current sample evidenced less severe symptomatology and comparatively higher GAS scores than the samples in Cooper (2005) and Rogers, Harrison, Hazelwood, et al. (2007), psychological impairment was still a significant predictor ($r_s$ range from .31 to .40) of Miranda comprehension on the MSS. Moreover, psychotic symptoms from the SADS-C significantly predicted ($r = -.26$) comprehension of Miranda vocabulary. The magnitude of the relationships found between GAS scores and performance on the MSS and MVS ranged from small to large ($r_s$ from .20 to 42). Interestingly, many of the effect sizes observed in the current study between Axis I impairment and Miranda understanding
These findings have important implications for Miranda waiver evaluations, and indicate that psychological functioning should be examined even when a severe mental disorder is not apparent.

Rogers and colleagues (2007) indicated that psychological impairment played a major role in Miranda reasoning ability by contributing unique variance ($\Delta R^2 = .038$) after all other variables were considered. Current findings showed a small, nonsignificant relationship between MRS scores and GAS estimates ($r = .15$). While the effect sizes found in these studies are relatively similar, psychological impairment did not emerge as a significant predictor of Miranda reasoning in the current study. This discrepancy could be explained by the marked differences between the two samples as described above. Specifically, the present sample of defendants was functioning reasonably well, with less than five percent evidencing psychotic symptoms or severe psychological impairment. It is likely that psychological functioning would add significant predictive ability of Miranda capacities in a sample comprised of more individuals that are experiencing severe psychotic and/or mood symptoms, such as those used by Cooper (2005) and Rogers, Harrison, Hazelwood, et al. In addition to mood and psychotic psychopathology, the current study also examined two highly prevalent Axis I disorders that have been excluded from earlier research, ADHD and substance dependence.

**ADHD.** Eyestone and Howell (1994) reported that one-fourth of adult criminal defendants currently meet diagnostic criteria for ADHD. A similar prevalence rate was found in the current sample of recently arrested defendants, with 22.2% reporting both...
childhood and adult symptoms of ADHD. Results of the current study also indicated that
symptoms of ADHD were commonly reported, with inattention being more prevalent
than impulsivity. Specifically, almost half of the sample reported issues related to
daydreaming while working, being easily distracted, and blurting out answers before the
question is asked. One explanation for this finding is that the hyperactive–impulsive
symptoms of ADHD decline with increasing age, whereas inattention remains a
prominent clinical feature of ADHD in adults (Davidson, 2008).

It is not difficult to see how symptoms of ADHD, such as impulsivity and
inattention, may interfere with a defendant’s competence to waive their Miranda rights.
Research utilizing multiple neuropsychological assessment instruments with a range of
populations have all concluded that ADHD is associated with a number of cognitive
deficits in adults (Obolensky, 2006; Quinlan & Brown, 2003; Samuelsson, Lundberg, &
Herkner, 2004; Samuelsson et al., 2004; Schoechlin & Engel, 2005; Woods et al., 2002),
such as difficulties with complex and sustained attention as well as verbal memory.
Moreover, past research with juvenile defendants (Viljoen & Roesch, 2005) found that
individuals with a high number of ADHD symptoms demonstrated poorer performance
on measures of Miranda comprehension. However, this is the only published study of the
effects of ADHD on Miranda abilities, and there is no past literature available on this
relationship with adult defendants.

Utilizing a sample of recently arrested adult offenders, the strength of the
relationships observed between number of ADHD symptoms reported and performance
on measures of Miranda comprehension ranged from small to medium ($r$ ranging from
-.18 to -.25). Defendants reporting severe ADHD symptomatology evidenced poorer comprehension of Miranda warnings ($d = .46$) and Miranda vocabulary ($d = .46$) than defendants reporting no or mild ADHD symptoms. This finding was especially true when the Miranda warning was administered orally rather than in a written format ($d = .54$), which suggests that individuals suffering from ADHD symptomatology have more difficulty processing and comprehending orally-presented material. A probable explanation is that individuals with ADHD typically show deficits in complex attention and verbal memory (Obolensky, 2006; Quinlan & Brown, 2003; Samuelsson, Lundberg, & Herkner, 2004; Samuelsson et al., 2004; Schoechlin & Engel, 2005; Woods et al., 2002). This is an important consideration given the extreme variability in the length of Miranda warnings, with some warnings reaching 547 words (Rogers, Harrison, Shuman, et al., 2007; Rogers, Hazelwood, et al., 2007). A defendant with severe ADHD symptoms that is read one of the lengthier Miranda warnings is certain to have difficulty processing the material and may not be capable of making a knowing Miranda waiver.

It is important to note that symptoms of ADHD alone did not significantly predict Miranda understanding in the present study. In a regression analysis, the combination of ADHD symptomatology and current attentional impairment explained a significant proportion of the variance (8.5%) in MSS performance; however, neither variable provided predictive ability on its own. Since cognitive deficits have been consistently observed in adults with ADHD in past research (Obolensky, 2006; Quinlan & Brown, 2003; Samuelsson, Lundberg, & Herkner, 2004; Samuelsson et al., 2004; Schoechlin & Engel, 2005; Woods et al., 2002), it makes sense that results from neuropsychological
testing should be used to support conclusions in the assessment of ADHD. Davidson (2008) recommends that a valid and reliable assessment of ADHD should be comprehensive and include the use of symptom rating scales, a clinical interview, neuropsychological testing, and the corroboration of patient reports. Current findings further support that defendants’ subjective self-reports of ADHD symptoms should be corroborated with evidence of attentional impairment from neuropsychological testing before attributing deficits in Miranda comprehension to ADHD.

ADHD has been conceptualized as consisting of two components, inattention and impulsivity/hyperactivity (APA, 2000). It was hypothesized that each of these components would negatively impact defendants’ competence to waive their Miranda rights in different ways. Since inattention and distractibility have been associated with difficulties in verbal memory and reading comprehension (Obolensky, 2006; Quinlan & Brown, 2003; Samuelsson et al., 2004; Schoechlin & Engel, 2005; Woods et al., 2002), it was assumed that a lack of attention during Miranda advisements would affect defendants’ comprehension and understanding of the warnings. Present findings supported this hypothesis, in that symptoms related to inattention were significantly correlated with measures of Miranda comprehension ($r_s$ range from -.24 to -.34).

Impulsivity, on the other hand, has been associated with deficits in planning and reasoning abilities (Schoechlin & Engel, 2005; Woods et al., 2002). With respect to Miranda competence, it was hypothesized that impulsivity may lead to a defendant readily giving a statement to police without decisional reasoning or an appreciation that the statement may be detrimental to their case. However, results indicated that symptoms
consistent with impulsivity were not related to Miranda reasoning ability as measured by the MRS. As previously mentioned, the capacity to consider reasons to waive or exercise rights was better explained by other factors, such as symptoms of substance dependence. While both ADHD and substance dependence are typically considered to be associated with impulsivity, a possible explanation for the current findings is that these conditions are comprised of different components of impulsivity. Specifically, the impulsivity facet of ADHD is more closely related to hyperactivity. Moreover, impulsivity associated with ADHD is conceptualized as a trait of the individual, rather than a situational state that becomes an issue only in a particular circumstance (e.g., Miranda waiver decision). Substance dependence, on the other hand, has been associated with a type of impulsive decision-making, referred to as temporal discounting (Bickel & Marsch, 2001; Monterosso, Kalechstein, & Cordova, 2007; Vuchinich & Tucker, 2003). Although substance dependent defendants may also exhibit the trait of impulsivity, intoxication and withdrawal associated with this disorder may exacerbate that impulsivity and result in rash decisions. This concept will be discussed in more detail below.

Substance dependence. Substance use may most easily be conceptualized as a situational factor impacting the defendant’s mental state at the time of the Miranda waiver. Specifically, intoxication during the interrogation can have obvious effects on defendants’ ability to comprehend and make decisions about their rights. However, the Axis I disorder of substance dependence presents a more chronic cluster of cognitive, behavioral, and physiological symptoms. The DSM-IV-TR (APA, 2000) describes this disorder as “continued use of the substance despite significant substance-related
problems” and “a pattern of repeated self-administration that can result in tolerance, withdrawal, and compulsive drug-taking behavior” (p.192). Substance dependence results in long-term functional impairments that can have a negative impact on Miranda-related capacities.

A high prevalence of substance abuse and dependence has consistently been observed in correctional populations. Specifically, past research indicated that close to half of male (Peters et al., 1998) and female (Jordan et al., 1996; Teplin et al., 1996) offenders met diagnostic criteria for substance use disorders. Similarly, over half (62.4%) of the current sample of offenders met diagnostic criteria for substance use disorders. Of defendants reporting symptoms of substance abuse or dependence, the majority (39.7%) identified marijuana as their drug of choice, but many of those (78.3%) reported at least some use of other substances in the past year as well. Contrary to previous research (Jordan et al.; Teplin et al.), only approximately one-third of females met criteria for substance use disorders in the current sample. This discrepancy may be due to important differences between the samples investigated in these studies. The current study was conducted with pretrial detainees from a small jail facility servicing both rural and urban areas; the sample was largely composed of European Americans and possessed mainly misdemeanor charges. In stark contrast, Jordan and colleagues utilized a sample of convicted felons from a state prison. Although Teplin and colleagues also examined pretrial jail detainees, the facility was located in a large, urban area, and their sample was primarily comprised of African American females.
Severe substance withdrawal can lead to symptoms of delirium, including disturbed consciousness and cognitive deficits, that may continue for up to four weeks (APA, 2000). Moreover, psychotic and mood symptoms persisting for up to weeks at a time may also result. This type of impairment can lead to a limited ability to think rationally and autonomously in an interrogation setting (Davison & Forshaw, 1993). Therefore, the validity of Miranda waivers obtained while defendants are withdrawing from substances is often challenged by defense attorneys (Davison & Forshaw; Gudjonsson, 2003; Weiss, 2003). On this point, United States ex rel. Collins v. Maroney (1968, p. 423) deemed that a confession made by a narcotic addict experiencing withdrawal symptoms during the interrogation “was not the product of a rational intellect and free will and is thus constitutionally inadmissible.”

Substance use disorders have been shown to cause significant deficits in cognitive functioning, such as problems with attention, memory, and decision making (Lundquist, 2005; Verdejo-Garcia et al., 2004; Vik et al., 2004). Therefore, it was hypothesized that defendants meeting criteria for substance dependence would evidence impairment on Miranda comprehension instruments. Overall severity of substance use, as measured by symptoms of substance dependence, demonstrated a moderate relationship to good versus poor ability to comprehend the Miranda warning ($r = .25$). However, no significant findings resulted between severity of substance use and comprehension of Miranda vocabulary. It is important to consider the primary drug of choice (i.e., marijuana) of the current sample when discussing these results. Specifically, those with Cannabis Dependence may not exhibit obvious signs of substance withdrawal or may demonstrate
less severe withdrawal symptoms than those dependent on other substances (APA, 2000). Therefore, it is expected that the current results may not evidence as strong effect sizes as may be seen with dependence to harder substances. However, past research may provide another potential explanation for the present findings. Interestingly, Viljoen, Roesch, & Zapf (2002) found that defendants with primary substance use disorders evidenced better comprehension ($d$s ranging from .33 to .58) on the ToCC, a instrument designed to measure understanding of Canadian interrogation warnings, than all other comparison groups (i.e., psychotic, affective, and no diagnosis). Although substance users did, at times, demonstrate impaired legal abilities, findings indicated that individuals with other types of mental disorders and impairments exhibited greater difficulty in understanding the interrogation warnings. Therefore, other factors (e.g., psychotic symptoms, mood disorders, cognitive impairment) may be better predictors of impaired Miranda comprehension.

An interesting finding resulted when examining the relationship between substance dependence and Miranda reasoning ability. Specifically, the total number of clinically significant dependence symptoms was the primary predictor of performance on the MRS when considering the effects of cognitive, psychological, and mental state variables. Moreover, drug-dependent defendants demonstrated significantly better Miranda reasoning than their non-abusing counterparts ($d = .39$). This unexpected finding may be explained by the fact that the current sample evidenced better reasoning ability regarding their motivation to waive rather than exercise their Miranda rights ($d = .36$). Drug-dependent defendants may have more personal reasons to waive their rights.
considering the immediate circumstances than non-dependent defendants. For example, defendants arrested on drug charges may waive their rights and talk to police out of the perception that the police have proof of their offense (Sigurdsson & Gudjonsson, 1994). Gudjonsson (2003) further indicated that substance users may waive their Miranda rights and offer a confession because they are focusing exclusively on the short-term consequences of their behavior out of a desire to be released from custody and obtain more drugs.

Gudjonsson’s (2003) theory is similar to the concept of temporal discounting, often addressed in substance dependence research (Bickel & Marsch, 2001; Monerosso et al., 2007; Vuchinich & Tucker, 2003). This theory specifies that substance dependent individuals are more likely to select brief, but immediately available, rewards (e.g., drug intoxication or relief of withdrawal symptoms) over more beneficial but delayed rewards. When compared to non-substance dependent individuals, greater temporal discounting has been found among alcohol abusers (Vuchinich & Simpson, 1998) and heroin addicts (Kirby, Petry, & Bickel, 1999). This type of impulsive decision-making may also have a negative effect on Miranda waiver decisions. Davis and O’Donohue (2004) describe temporal discounting in relation to Miranda cases as the “purely stress-driven motivation to escape the interrogation itself or immediate confinement” which may override rational decision-making (p. 917). In other words, a defendant may give up their constitutional protections in order to obtain perceived immediate benefits. For example, Sigurdsson and Gudjonsson (1994) found that 60% of suspects who confessed to their crimes believed they would be allowed to go home if they made a statement to police. Based on this
research, the current findings likely indicate that substance dependent defendants generate more reasons to waive their rights due to temporal discounting out of a desire to obtain some perceived immediate benefit.

*Abnormal Mental States*

Defendants may suffer from abnormal mental states that adversely impact their competency abilities without having a history of impaired cognitive functioning or mental disorder (Grisso, 2003; Gudjonsson, 2003). It is common for detainees to experience extreme anxiety regarding uncertainty about their current legal predicament and what is likely to happen to them in the future (Gudjonsson). Moreover, many defendants are not in a normal mental state due to substance intoxication, physical illness (e.g., diabetes or heart disease), or sleep deprivation. All of these factors may make a defendant more vulnerable to waiving their rights and confessing in order to relieve distress or obtain needed medical care (Gudjonsson).

Historically, case law has evidenced a tendency toward discounting issues related to a defendant’s mental state when determining the voluntariness of a Miranda waiver and subsequent confession. For example, the court in *Bae v. Peters* (1991, p. 475) affirmed that “absent improper police coercion, a defendant's mental state does not render a confession involuntary under the due process clause.” The Virginia Court of Appeals in *Commonwealth v. Peterson* (1992, p. 488) recognized that “the amount of coercion necessary to trigger the due process clause may be lower if the defendant's ability to withstand the coercion is reduced by intoxication, drugs, or pain.” However, the final
conclusion was that “some level of coercive police activity must occur before a statement or confession can be said to be involuntary.”

Several researchers (Davison & Forshaw, 1993; Grisso, 2003; Gudjonsson, 2003; Rogers & Shuman, 2005) have acknowledged the importance of considering transient mental states when utilizing a totality of the circumstances approach to Miranda waiver evaluations. Moreover, recently presented research (Gillard & Rogers, 2009) using a mock-crime paradigm with college students indicated that situational stress increased state anxiety and impaired Miranda comprehension. The current study evaluated the effects of two frequently observed abnormal mental states, attentional impairment and substance intoxication, on Miranda-related competencies by examining defendants within 36 hours of their arrest.

Attentional impairment. Defendants may evidence attention deficits related to their current situation and mental state when administered their Miranda rights and interrogated by police. As previously discussed, intense situational anxiety is common amongst individuals that have been arrested and confined in jail (Gudjonsson, 2003; Rogers & Shuman, 2005). Research has indicated that such state anxiety can have detrimental effects on an individual’s working memory and attention (Eysenck, 1982). Moreover, other mental state factors, such as physical illness, sleep deprivation, and intoxication, may also have an adverse impact on a defendant’s attentional abilities (Gudjonsson). These attention deficits commonly occur in defendants without a history of ADHD. In the current sample, over one-third (36.7%) of the defendants evidenced significant attentional impairment on the VSAT, a neuropsychological instrument
designed to measure sustained attention, without meeting criteria for a diagnosis of ADHD.

Inattention is often associated with a lack of focus on details and a need for things to be repeated several times due to an inability to concentrate (APA, 2000). Therefore, attentional impairment may prevent a defendant from adequately processing and comprehending written or orally-presented information, such as their Miranda rights. If a defendant fails to grasp certain details of the Miranda warnings, they will be at a significant disadvantage. For example, defendants that become distracted before they are told that they can exercise their rights at anytime, may not understand that they can stop the interrogation even once they have started answering questions. Therefore, it was hypothesized that attentional impairment at the time of the interrogation would result in poorer Miranda comprehension and reasoning.

Results of the current study demonstrated small but significant relationships ($r$ range from .19 to .27) between sustained attention and Miranda comprehension. Moreover, defendants evidencing severe attentional impairment correctly defined fewer Miranda vocabulary terms ($d = .39$) and correctly paraphrased significantly fewer components of the Miranda warning ($d = .37$) than their non-impaired counterparts. Although not directly related to Miranda competencies, similar results have been found in competence to stand trial research (Nestor, Daggett, Haycock, & Price, 1999). Specifically, individuals found incompetent to stand trial demonstrated significantly more impairment on tests of attention and concentration than their competent counterparts ($d = .39$). Notably, current attentional impairment in the present study was a significant
predictor of comprehension of Miranda statements even when examining only defendants with average to above average intelligence. This finding supports theories presented by Gudjonsson (2003), who indicated that abnormal mental states at the time of interrogation may have an adverse impact on all individuals regardless of their typical level of functioning.

Notably, defendants in the current study had even more difficulty when the Miranda warning was administered orally rather than in a written format ($d = .50$). On that note, Rogers (2008b) found that recently arrested detainees failed to comprehend orally-presented warnings almost three times more frequently than their written counterparts. These findings indicate that use of oral advisements strongly disadvantages suspects’ ability to comprehend the basic concepts of Miranda warnings. Orally-presented warnings likely place greater cognitive demands on individuals than warnings presented in a written format. This is particularly concerning when considering the frequency with which Miranda warnings are administered orally. Specifically, Kassin et al. (2007) found that 67% of Miranda advisements are done in an oral format.

**Intoxication.** A large proportion of criminal defendants are intoxicated on drugs and/or alcohol at the time of arrest and interrogation. Past research (Zhang, 2003) found that close to three-fourths of recently arrested defendants tested positive for substances in an urinalysis drug screening. In the current sample, more than 60% of defendants reported use of drugs and/or alcohol within the week preceding testing, with more than one-third (33.9%) reporting daily use of substances. The majority (74.6%) of defendants in the present study did not report use of hard substances, such as cocaine,
methamphetamine, and heroin; however, a small percentage (5.1%) acknowledged daily use of these substances.

According to the DSM-IV-TR (APA, 2000), Substance Intoxication occurs when significant maladaptive behavioral or psychological changes result from the effect of the substance on the central nervous system. Commonly observed consequences include belligerence, mood lability, cognitive impairment, and impaired judgment. These effects may have a substantial impact on a defendant’s ability to comprehend their Miranda rights and make rational decisions regarding the waiver of those rights (Grisso, 2003).

Although case law regarding the impact of intoxication on the knowing or intelligent prongs of Miranda waiver decisions was not found, several cases have addressed the effect of intoxication on the voluntariness of a Miranda waiver. For example, the United States District Court in Logner v. North Carolina (1966, p. 975) affirmed that “the essential fact that the petitioner was under the influence of alcohol and drugs to such an extent as to affect his judgment and that he was interrogated in that condition would render the statements involuntary.” However, in U.S. v. Brown (1976, p. 427), the court stated that “custodial statements are not per se involuntary because of intoxication. The standard is whether, by reason of intoxication or other factor, defendant’s will was overborne or whether his statements were the product of a rational intellect and a free will.” Similarly, the court in Andersen v. Thieret (1990, p. 530) concluded that “intoxication by itself could not support a finding of involuntariness and is relevant only to the extent it made him more susceptible to mentally coercive police tactics.” In Ohio v. Stewart (1991, p. 147), the court determined that “while the presence
of drugs or alcohol should be considered, the amount must sufficiently impair the confessor's abilities to reason." Although these past court decisions acknowledged the marked effects intoxication may have on defendants’ capacity to make rational decisions, they also highlight the fact that being under the influence of alcohol or drugs is only one facet to be considered.

Researchers have also emphasized the importance of taking into account intoxication when evaluating the validity of a Miranda waiver. On this point, Gudjonsson (2003) reported that the odds of a suspect making a confession were more than three times greater if that suspect had reported using an illicit drug within 24 hours of his or her arrest, compared with a suspect who claimed that he or she had not taken any illicit substance during that period. He further indicated that intoxicated suspects may have trouble fully understanding their legal rights and may not be able to appreciate the consequences of the statements they provide to police. Unexpectedly, results of the current study did not fit with Gudjonsson’s theory. Specifically, the present findings indicated that recent substance use did not significantly predict performance on measures of Miranda comprehension or reasoning. Moreover, small effect sizes (\(d\)s ranging from .04 to .31) were observed for all Miranda measures when comparing the performance of low (no substance use) and high (daily use) frequency substance users. Although intoxicated suspects in past research (Sigurdsson & Gudjonsson, 1994) reported an inability to think clearly during the interrogation, one plausible explanation for the current findings is that the feeling of confusion is a subjective experience that does not
necessarily affect suspects’ capacity to comprehend the Miranda warnings or influence their reasons for making a confession.

The seemingly absent relationship between intoxication and Miranda abilities in the present study may also be attributed to the lack of variability in type of substances used in the current sample. As previously mentioned, the majority of the present sample (74.6%) reported use of only alcohol and/or marijuana, with no reported use of harder substances such as cocaine and marijuana. The DSM-IV-TR (APA, 2000, p. 200) stated that “the specific clinical picture in Substance Intoxication varies dramatically among individuals and also depends on which substance is involved.” Furthermore, reviews of research related to the negative effects of substance use on cognitive functioning (Lundqvist, 2005; Verdejo-Garcia et al., 2004; Vik et al., 2004) revealed that the type and severity of cognitive impairment differs widely depending on the type of substance used. A supplementary analysis of the present data supported this theory. Specifically, when examining recent use of all substances, correlations with Miranda comprehension and reasoning were small and non-significant. However, when examining recent use of only hard substances (i.e., cocaine, stimulants, heroin, and sedatives), small but significant correlations ($r$s ranged from .23 to .29) were found with both Miranda comprehension and vocabulary ability. Although recent use of alcohol and marijuana did not significantly impact Miranda capacities, it appears that recent use of hard substances does affect an individual’s ability to comprehend the Miranda warnings. With very few (8.5%) defendants in the current sample reporting frequent use (> 3 days) of hard drugs, more sophisticated analyses could not be conducted.
Each of the domains categorized in the psychological vulnerabilities model (Gudjonsson, 2003) has been found through the current study to have a substantial effect on Miranda comprehension and reasoning ability in recently arrested defendants. Notably, intellectual deficits and psychological functioning emerged as significant predictors of Miranda comprehension even in a sample of defendants that were not obviously impaired. In the first study of the relationship between attention deficits and Miranda competencies in adults, attentional impairment attributed to both ADHD and transient situational factors was found to adversely impact understanding of Miranda warnings. Interestingly, substance dependence was found to have a substantial affect on Miranda reasoning ability. Specifically, drug-dependent defendants produced more reasons to waive their rights and provide statements to the police than their non-dependent counterparts, possibly as a result of temporal discounting. In light of the current findings, it is essential that cognitive functioning, mental disorders, and transient mental states be considered when determining the validity of a Miranda waiver. Moreover, there are important implications for clinical practice involving Miranda evaluations.

Clinical Practice

During criminal proceedings, the defense may claim that the defendant was incompetent to waive his or her Miranda rights and the statement should be excluded (Melton et al., 2007). A forensic psychologist or psychiatrist may then be asked to form an opinion regarding the defendant’s mental state and functioning at the time of the waiver. Unfortunately, expert testimony from mental health professionals is rarely
utilized in these situations (Melton et al.). On this point, Ryba, Brodsky, and Shlosberg (2007) found that only about one-fourth of forensic psychologists were involved in Miranda-waiver evaluations. Instead, Melton and colleagues suggested that courts typically focus on two superficial points, whether the police “followed the book” and whether the defendant “seemed okay” at the time of the interrogation. In other words, the issue is not raised unless it is so obvious that it cannot be ignored. Expert testimony is typically only employed in cases involving significant mental impairment or when viewed as one of the last options by the attorney.

Forensic mental health professionals face with numerous challenges when they conduct Miranda waiver evaluations. First, Miranda evaluations are typically conducted weeks, months, or even years after the interrogation took place (Melton et al., 2007; Rogers, 2008; Rogers & Shuman, 2005). It is likely that the condition that may have created the incompetency (e.g., intoxication or mental illness) has remitted or improved by the time of the evaluation (Melton et al.). Retrospective evaluations make it almost impossible to ascertain, with complete accuracy, the defendant’s mental state at the time of waiver (Rogers & Shuman). On this point, seminal work by Grisso (1981) indicated that a defendant’s understanding of the Miranda rights at the time of the evaluation may not represent their capacities at the time of the waiver. In his study of juveniles’ comprehension of Miranda rights, the participants demonstrated a significant increase (37.5%) in CMR scores after only a two-day interval. The issue of retrospective evaluations could be prevented with quick screening of suspects before interrogation or Miranda evaluations conducted within days of the defendant’s arrest (Rogers).
A second complication in conducting Miranda evaluations is the extreme variability found among the Miranda warnings used across the United States. Data from a nationwide survey of Miranda warnings in 945 jurisdictions yielded more than 800 distinct versions with marked inconsistencies in wording and content (Rogers, Harrison, Shuman, et al., 2007; Rogers, Hazelwood, et al., 2007). Furthermore, these Miranda warnings ranged dramatically in terms of length (49 to 547 words) and required reading ability (3rd grade to postgraduate education). Although a defendant with a 6th grade reading level may have no difficulty comprehending a warning written at a 3rd grade level, they will likely demonstrate significant misunderstanding of a warning written at a college level. Therefore, it is important for mental health professionals conducting Miranda evaluations to be familiar with the version utilized in the jurisdiction in which the evaluation is being conducted (Frumkin, 2000; Rogers & Shuman, 2005). Moreover, many jurisdictions use multiple versions of the Miranda warning, indicating a need for the evaluator to be aware of which specific warning was administered to the defendant.

A third and final complication is the lack of standardized forensic assessment instruments available that address the validity of Miranda waivers (Rogers & Shuman, 2005). Grisso’s (1998) Instruments for Assessing Understanding and Appreciation of Miranda Rights are currently the only published measures available that are designed to assess Miranda comprehension. However, these measures were based on the Miranda warning used in St. Louis County during the 1970s, and are not generalizable to jurisdictions using other versions. Furthermore, the majority of research conducted on these instruments used juvenile samples; therefore, they lack sufficient data on reliability.
and validity with adult populations (Rogers et al., 2004). Greenfield, Dougherty, Jackson, Podboy, and Zimmerman (2000) developed a set of guidelines for the retrospective psychological evaluation of the competency of Miranda waivers called the Miranda Checklist Inventory (MCI). However, the MCI is not considered a standardized instrument and lacks research on its clinical utility.

Recent Miranda research has provided promising developments in the area of specialized Miranda instruments. A revised version of Grisso’s (1998) measures, entitled the Miranda Rights Comprehension Instruments – II (MRCI-II), is currently being finalized with the goal of increasing the applicability to other jurisdictions (Goldstein et al., 2003). Initial findings suggest that the revised instruments demonstrate adequate psychometric properties (Kalbeitzer et al., 2008); however, the research on these instruments remains primarily focused on juvenile offenders. Through programmatic research on Miranda warnings, Rogers (2005, 2006a, 2006b) developed a new generation of Miranda assessment instruments. These three research measures were utilized in the current study and address Miranda comprehension, vocabulary, and reasoning. Preliminary validation studies indicate that the instruments demonstrate excellent reliability and validity; however, further research and refinement is presently underway. Unfortunately, neither the MRCI-II or Rogers instruments are currently available for clinical use.

Models for Conducting Miranda Rights Waiver Evaluations

Guidelines for conducting Miranda waiver evaluations have only recently been addressed in published forensic resources (Frumkin, 2000; Gudjonsson, 2003; Rogers &
Shuman, 2005). While landmark forensic references, such as Melton et al. (2007) and Grisso (2003), provide important information regarding relevant case law and theoretical considerations, they do not offer practical models for conducting evaluations regarding the validity of Miranda waivers. Conversely, Rogers and Shuman provide an assessment model for Miranda waiver evaluations that integrates standardized methods addressing both cognitive and psychological domains as well as case-specific approaches, such as consideration of interrogative circumstances.

Gudjonsson (2003) proposed a conceptual framework of various psychological vulnerabilities that may be present in a suspect being interrogated and was utilized in the current study. These psychological characteristics may impact a defendant’s capacity to provide a valid Miranda waiver and subsequent confession. Forensic mental health professionals can use this model to guide evaluations regarding a defendant’s competency to waive their Miranda rights. Methods for assessing each of the domains included in Gudjonsson’s model and the present study will be discussed in further detail, which includes: cognitive functioning, mental disorders, and abnormal mental states.

**Cognitive Functioning**

A primary issue in Miranda evaluations is whether the defendant had the cognitive capacity to make a knowing and intelligent waiver (Rogers & Shuman, 2005). Cognitive impairment impacting Miranda competencies may be diffuse deficits or related to a specific ability. Therefore, cognitive factors, such as intelligence, reading ability, and memory capacity are frequently cited as areas to address in Miranda evaluations.
Intelligence. The strongest evidence of incompetency may be found in cases where the defendant has severe intellectual impairment, such as mental retardation. Therefore, assessment of an individual’s intellectual functioning is essential to Miranda waiver evaluations. On that point, Rogers and Shuman (2005) suggest utilizing the WASI (Wechsler, 1999) in cases where the defendant does not appear to suffer from cognitive impairment. In cases where impairment is suspected, they recommend more comprehensive assessments using the WAIS-III (Wechsler, 1997), with particular attention to the Verbal IQ and the Verbal Comprehension Index. These subtests are most relevant to competency issues, as they measure abilities such as vocabulary, verbal abstract reasoning, judgment, attention, and short-term memory. Frumkin (2000) also recommends the Wechsler tests, with an emphasis on verbal abilities. The recently released WAIS-IV (Wechsler, 2008), which provides a comprehensive assessment of cognitive abilities with updated norms and enhanced test materials, may be the most appropriate instrument for defendants suspected to suffer from cognitive deficits.

Reading and listening comprehension. Specific deficits in reading and listening comprehension are particularly relevant to Miranda competency (Rogers & Shuman, 2005). A defendant’s academic abilities should be evaluated to ensure they match the difficulty level of the Miranda warning and waiver form that were administered to the defendant (Frumkin, 2000). Forensic clinicians should also consider the procedures used in the jurisdiction in question to determine the importance of the defendant’s reading versus listening comprehension in relation to their Miranda competency. Rogers and Shuman suggest the use of the WIAT-II, as it yields grade-equivalent scores for word
reading, oral expression, reading comprehension, and listening comprehension. Frumkin additionally recommends the use of the Wide Range Achievement Test (3rd ed., WRAT-3; Wilkinson, 1993). However, Rogers and Shuman caution against the use of the WRAT-3 since it only assesses word recognition, not reading comprehension. It should be noted that the recently published WRAT-4 (Wilkinson & Robertson, 2006) includes a new subtest measuring sentence comprehension, and could be used as an adequate screen for reading ability.

Mental Disorders

Defendants’ Miranda capacities can also be impaired by severe psychopathology (Frumkin, 2000; Gudjonsson, 2003; Rogers & Shuman, 2005; Viljoen, Roesch, & Zapf, 2002). Frumkin identified several aspects of an individual’s psychological and emotional functioning that could affect a knowing, intelligent, and voluntary waiver of the Miranda rights, including reality testing, submissiveness, impulse control, coping, and thinking abilities. He recommends use of the Minnesota Multiphasic Personality Inventories, Rorschach Inkblots, or 16 Personality Factor (16 PF) for evaluating these areas.

Rogers and Shuman emphasize the need to take into account the retrospective nature of the evaluation and the severity of Axis I symptoms at the time of the waiver. Therefore, they strongly recommend using the Schedule for Affective Disorders and Schizophrenia (SADS; Spitzer & Endicott, 1978b) Axis I interview to assess the effects of psychological symptoms on a defendant’s functioning. The SADS has been validated for the evaluation of prior episodes and provides accurate ratings of symptom severity, rather than merely identifying the presence of current symptoms. Rogers and Shuman
also suggest the use of an abbreviated version of the SADS, the SADS-C (Spitzer & Endicott, 1978), for cases in which the defendant appears to be well-adjusted.

Key disagreements exist between the suggested assessment techniques of Frumkin (2000) and Rogers and Shuman (2005). Although Frumkin recommends traditional psychological instruments that have been used to test various aspects of an individual’s psychological and emotional functioning, some of these instruments (i.e., Rorschach Inkblots and 16 PF) are rarely used in forensic evaluations because they are not always accepted under the Daubert standard (Daubert v. Merrell Dow Pharmaceuticals, 1993) for admissibility. In a survey of diplomates in forensic psychology regarding the acceptability of using various tests and techniques in forensic practice, both the Rorschach Inkblots and 16 PF were generally considered unacceptable (Lally, 2003). In contrast, Rogers and Shuman recommended assessment measures that meet both professional and admissibility requirements. Furthermore, the SADS interviews contend with paramount issues to Miranda evaluations that are not addressed by the instruments suggested by Frumkin: (a) evaluation of prior episodes and (b) the effects of the symptoms on the defendant’s functioning.

Another important area of focus in Miranda evaluations is the assessment of substance dependence. Although this disorder has been virtually ignored in available models for Miranda waiver evaluations, results of the current study indicate that symptoms of substance dependence may have a negative effect on adequate Miranda comprehension and reasoning. Present findings identify a need to assess for this condition in a comprehensive Miranda evaluation. However, substance dependence can be difficult
to assess because defendants are often deceptive about their drug use (Rogers & Shuman, 2005). One option is the administration of the Structured Clinical Interview of DSM-IV Disorders (SCID-IV; First et al., 1996), which includes a module with extensive coverage of alcohol and substance use disorders. Although this interview provides substantial depth of information regarding many Axis I disorders, it can be time-consuming (45-90 minutes) depending on the complexity of the individuals’ psychiatric history (First et al., 1996). A brief alternative is the MINI (Sheehan et al., 1998), a structured diagnostic interview, with an administration time of approximately 15 minutes. It provides coverage of 17 Axis I disorders, including assessment of substance abuse and dependence. Since substance users may not be entirely forthcoming about their alcohol and drug use, it may be useful to collect information from a collateral source regarding the defendant’s substance abuse (Rogers & Shuman).

Abnormal Mental States

A defendant’s mental state at the time of the Miranda waiver is a vital component of an evaluation of Miranda competency. However, it is arguably the most difficult aspect to assess given the retrospective nature of most Miranda waiver evaluations. If the defendant is not evaluated shortly after their arrest and interrogation, the forensic clinician must rely on records to reconstruct the defendant’s mental and physical state at that time. Gudjonsson (2003) recommends reviewing police records, interviewing the suspect, and obtaining information from relatives or doctors who visited the suspect while in custody. Similarly, Frumkin (2000) suggests obtaining transcripts and/or recordings of the interrogation and the defendant’s statements in order to compare them.
with the defendant’s version of what transpired. He further recommends obtaining
transcripts of depositions of witnesses who observed the defendant at the time of arrest
and/or police questioning. Unfortunately, transcripts are often rare and the defendant may
be a poor historian due to intoxication or even delirium at the time of the waiver.

In the event that a defendant can be evaluated within hours of their arrest and
interrogation, there are several options for evaluating their mental state. Immediate
thinking abilities can be assessed through the use of mental status tests, such as the
Cognistat (Kiernan, Mueller, Langston, & Van Dyke, 1995) or Mini Mental State Exam
(MMSE; Folstein, Folstein, & McHugh, 1975). These instruments can provide useful
information regarding several aspects of neurocognitive functioning (e.g., attention,
memory, and judgment). Neuropsychological instruments designed to evaluate specific
deficits can also be utilized. For example, the VSAT (Trennery et al., 1990) was used in
the present study to measure current attentional abilities. Substance intoxication can be
evaluated through the use of breathalyzer tests and/or urinalysis. Police may have
conducted such tests at the time of arrest or detention if the defendant was suspected of
intoxication; therefore, forensic clinicians may be able to obtain police records containing
these results.

Limitations

The goal of this study was to evaluate mental disorders and mental states that may
negatively affect a defendant’s Miranda competencies. The primary limitation of this
study is the lack of a “gold standard” for measuring Miranda-related abilities. The only
Miranda instruments available for clinical and research use, Grisso’s (1998) Instruments
for Assessing Understanding and Appreciation of Miranda Rights, lack jurisdictional
generalization and adequate reliability and validity for adult populations. Therefore, the
current study utilized three instruments to measure Miranda comprehension and
reasoning, the MSS, MVS, and MRS, that were recently developed by Rogers (2005,
2006a, 2006b) as part of his programmatic research on Miranda warnings. These newly
developed measures are unpublished and currently available for research purposes only.
Although these instruments have limited research available at this time, all three
measures have demonstrated promising psychometric properties in initial studies. A
related limitation of the present study is the lack of a standardized measure to assess the
voluntary prong of Miranda waivers. Determinations regarding voluntariness require a
close examination of the situational aspects of each individual’s interrogation through
police records and collateral interviews. This crucial component of Miranda waiver
evaluations could not be assessed in this study.

Characteristics of the sample is another limitation of the current study.
Specifically, the study was limited by the lack of diversity, especially in relation to types
of substances used. The majority of defendants (74.6%) reported only use of alcohol
and/or marijuana in the week prior to the evaluation, which was not associated with
impairment on measures of Miranda competency. However, supplemental analyses
looking at only users of hard substances (e.g., cocaine, heroin, methamphetamine)
evidenced significant correlations, indicating that certain types of substances may result
in greater impairment of Miranda abilities. A sample including more hard substance users
and single-substance users (e.g., cocaine only) would have allowed for additional analyses examining the effects of each type of substance.

Another limitation found in this study is related to the instrument utilized to evaluate ADHD. The DICA-R (Reich, 2000) was selected to evaluate the presence of ADHD because it provides a validated method of assessing both current and retrospective ADHD symptoms. However, it was developed to evaluate ADHD according to the DSM-III-R inclusion criteria (APA, 1987). Because the current DSM-IV-TR (APA, 2000) includes an additional four ADHD criteria, ADHD could not be fully assessed. It is likely that more defendants would have met the guidelines for diagnosing DSM-IV-TR ADHD had the additional criteria been assessed. The DICA-R was chosen despite this limitation because more recently updated assessment instruments of ADHD, such as the K-SADS (Ambrosini & Dixon, 1996) or Brown ADD scales (Brown, 2001), do not evaluate both current and retrospective symptoms. Establishing the presence of current symptoms as well as symptoms in childhood (before age 7) is necessary to diagnose ADHD in adults.

A final drawback to the current study involves the assessment methods used to establish recent substance use. Specifically, the SUI (Weiss et al., 1995) is a self-report instrument that consists of questions regarding the severity and frequency of eight types of substances in the week prior to the evaluation. Accurate information regarding substance use is often difficult to obtain in correctional settings when relying on self-report due to the perceived consequences among inmates for disclosing such information. Ideally, the study would have included laboratory-based methods of evaluating recent substance use and intoxication, including breathalyzer and urinalysis. However, such
methods could not be conducted in this study due to ethical concerns, as such data could be used as evidence in drug offense cases. Moreover, laboratory-based methods are not practical considering the research setting (i.e., jail holding cells). However, prior research utilizing the SUI (Hien et al., 2004; Najavits et al., 1998) found evidence of its criterion-related validity when compared to breathalyzer and urinalysis results.

Future Research

This study focused on the impact of attentional impairment and substance use on Miranda-related competencies. Other abnormal mental states, including state anxiety, sleep deprivation, and physical illness, may negatively impact defendants’ ability to comprehend and reason about their Miranda rights. Environmental factors, such as length of time in custody and police tactics, may also present as important determinants of defendants’ decision to waive his or her rights. These situational factors and how they interact with Miranda capacities in criminal defendants deserves further study.

Another direction for future research is related to the retrospective nature of Miranda waiver evaluations, which makes conducting these assessments quite difficult and complex. The validation of Miranda instruments for the retrospective assessment of Miranda-related competencies is a much needed area of study. This type of research design would require the defendant to be assessed shortly after arrest and a follow-up assessment conducted after a delayed time period. Longitudinal research of this type would allow for examination of the stability of competency-related knowledge and abilities.
The current study focused on Miranda-related competencies in relation to general English warnings in a sample of adult criminal defendants. Additional work is also needed on Miranda measures for different populations, such as juvenile offenders. Moreover, further research evaluating the comprehension and reasoning ability associated with translated Miranda warnings is essential. Initial research in this area by Rogers, Correa, Hazelwood, Shuman, Hoersting, and Blackwood (2008) found marked differences in the length and reading difficulty of Spanish Miranda warnings, with numerous inadequacies in the Miranda translations. However, it remains to be seen how these inadequate and complex translations affect the Miranda-related capacities of monolingual Hispanic defendants.

Based on recent presentations (Drogin, 2009), the next step in Miranda research will involve the proposed initiation of Miranda language reform and the scientifically informed development of simplified, standardized Miranda warnings. Following the development of a standardized warning, validation with diverse populations will be needed. This line of research should include samples similar to the one used in the current study that were recently arrested. It will be important to include participants diverse in terms of age, gender, ethnicity, education, and criminal background. Moreover, the sample should demonstrate a wide range of cognitive abilities, mental disorders, and abnormal mental states.

Summary

Forensic clinicians conducting Miranda waiver evaluations must be aware of the relevant issues that could affect defendants’ Miranda comprehension and reasoning. The
current study explored several cognitive, psychological, and mental state factors identified by Gudjonsson (2003) as psychological vulnerabilities that should be considered in a comprehensive assessment of the validity of Miranda waivers and subsequent confessions. Moreover, by evaluating recently arrested defendants, the present study was able to examine the impact of both chronic and situational factors related to attention deficits and substance use on Miranda competencies.

Principal determinants of defendants’ ability to provide knowing and intelligent waivers were similar to past research. Specifically, cognitive factors, including intelligence, reading comprehension, and listening comprehension, demonstrated substantial relationships with Miranda understanding in the current study. Moreover, the presence of severe psychological impairment provided some predictive ability of Miranda comprehension beyond the effects of cognitive functioning.

Important findings involved two highly prevalent Axis I disorders, ADHD and substance dependence, which were systematically investigated for the first time in relation to Miranda competencies. ADHD evidenced important effects on defendants’ ability to provide a knowing waiver. Defendants with severe ADHD symptomatology evidenced significant difficulty comprehending Miranda vocabulary and statements, especially when the Miranda warning was presented orally. Substance dependence, on the other hand, may have a profound influence on the intelligent prong of a Miranda waiver. Interestingly, substance-dependent defendants demonstrated significantly better Miranda reasoning ability regarding motivation to waive their rights. One explanation is that substance users may be focused exclusively on the short-term consequences of their
behavior, and talk to the police out a desire to be released from custody and obtain more
drugs (Gudjonsson, 2003).

This study represents the first published examination of the specific effects of
abnormal mental states in criminal defendants on Miranda-related abilities. By examining
criminal defendants within 36 hours of their arrest, both attentional impairment and
substance intoxication could be accounted for. First, this study revealed the importance of
examining attentional impairment resulting from situational circumstances when
conducting a Miranda waiver evaluation. Deficits in attentional abilities resulted in
problems with comprehension of Miranda statements and vocabulary, regardless of
whether the defendant met diagnostic criteria for ADHD. Second, the current findings
suggested that recent substance use, when primarily consisting of alcohol and marijuana
use, did not significantly predict Miranda competencies. However, preliminary findings
indicated that intoxication from harder substances (e.g., cocaine, heroin, and
methamphetamine) may contribute to impairment in Miranda comprehension. Because
the current sample included very few (8.5%) defendants who reported frequent use of
hard drugs, more sophisticated analyses could not be conducted. Future research with a
larger proportion of hard substance users is needed to confirm these findings. However,
the current results highlight the need to assess abnormal mental states at the time of arrest
and interrogation in all defendants, even when severe cognitive or mental disorders are
not suspected.

In closing, the current study expanded on the parameters of research related to
Miranda competencies by exploring the influence of cognitive functioning, mental
disorders, and abnormal mental states with a sample of recently arrested defendants. It was the first systematic investigation of the effects of substance use and attention deficits on Miranda-related capacities. This study provides an important contribution to the literature on factors affecting the validity of Miranda waivers. Implications for forensic practice were addressed, and a model for conducting Miranda-related evaluations was provided.
APPENDIX A

CONSENT FORM
Title of Study: Miranda Warnings and Waivers: Determinants of Comprehension and Reasoning
Principal Investigator Richard Rogers
Site: Grayson County Jail

Before agreeing to this research, you must understand its methods. This form describes the methods, benefits, and risks. It says you have the right to stop at any time. It makes no promises about the results of the study.

Purpose of the Study
Your part of the study looks at Miranda warnings used across the country. It looks at which statements are easy to understand. It looks at reading and listening. It looks at your verbal skills and any emotional problems. Each person is different. It looks at what things may affect your understanding of Miranda statements.

The study looks at how your understanding of Miranda can be affected. You will meet a researcher, who will ask me questions and give me scales to complete. It will take about 4 hours. If you remain in detention for a week, you can volunteer to repeat some of the measures; it will take less than 3 hours.

Procedures
17 measures are given. Most are brief and easy to complete. Two measures look at how well you listen and read. Two measures look at verbal abilities. One looks at emotional problems. Two ask about your drug and alcohol use. Two measures look at attention. Three look at your reactions to legal situations. One measure looks at how easy you can be influenced. Three measures look at parts of Miranda. If you gave a statement to police, a questionnaire asks for your ideas about this.

Possible risks
Most measures are used in clinical, school, and other settings. There are no known physical or emotional risks. Once in a while, subjects become slightly stressed. This is only for a short time. There is a slight chance data could be subpoenaed, but it will be anonymous.

You will not be asked about child abuse. If you give such information, the law requires the researcher to tell the authorities.

Benefits to Subjects and Others
You may learn things about yourself from this research. The research may help the understanding of Miranda statements.

Compensation for Participants
Fifteen dollars will be put in your account for your participation. If you volunteer and complete the retesting, you will receive another $10.

Procedures for Keeping Research Records Private
To protect privacy, only research numbers are used on the data. All data are locked in a research room. It will only be kept for the time of the study. A list of participants will be kept that is entirely separate from the research data and cannot be connected to the research data.
Review for the Protection of Participants

This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be reached at (940) 565-3940 with any questions regarding the rights of research subjects.

Questions about the Study

If you have any questions about the study, you may contact Dr. Richard Rogers at telephone number (940) 565-2671.

Research Participant's Rights

Your signature below indicates that you have read or have had read to you all of the above and that you confirm the following:

• A researcher has explained the study to you and answered all of your questions. You have been told the possible benefits and the potential risks and/or discomforts of the study.
• You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.
• You understand why the study is being conducted and how it will be performed.
• You understand your rights as a research participant and you voluntarily consent to participate in this study.
• You have been told you will receive a copy of this form.

________________________________
Printed Name of Participant

________________________________
Signature of Participant                                    Date

For the Principal Investigator or Designee:

I certify that I have reviewed the contents of this form with the subject signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the participant understood the explanation.

________________________________
Signature of Principal Investigator or Designee                Date
APPENDIX B

SUPPLEMENTAL TABLES
### Table B.1

**Substance Use Predictors of MSS Total Scores**

<table>
<thead>
<tr>
<th>Predictors</th>
<th>$r$</th>
<th>Adj $R^2$</th>
<th>Beta</th>
<th>$p$</th>
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</thead>
<tbody>
<tr>
<td><strong>Order 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>.003</td>
<td>-.119</td>
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<td>-.005</td>
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<td>.87</td>
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<td></td>
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<tr>
<td>Total Days of Substance Use</td>
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<td>-.007</td>
<td>.018</td>
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### Table B.2

**Substance Use Predictors of MVS Total Scores**

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<td>.003</td>
<td>-.169</td>
<td>.13</td>
</tr>
<tr>
<td>Total Dependence Symptoms</td>
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<td>.003</td>
<td>.110</td>
<td>.33</td>
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</table>
Table B.3

*Substance Use Predictors of MRS Total Scores*

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<th>Beta</th>
<th>$p  $</th>
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<td>.003</td>
<td>.137</td>
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REFERENCES


Coyote v. United States, 380 F.2d 305 (1967).


Ford v. State, 75 Miss. 101, 21 so. 524 (1897).


West v. United States, 399 F.2d 467 (1968).


