

**Addressing Relative Criteria for *Miranda* Waivers: A Comparison of Juvenile Justice Youths' and Adult Offenders' Understanding and Appreciation of the Rights to Silence and Legal Counsel during Police Interrogations**

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## **Dedication**

To James, my wonderful husband, for always encouraging me to do what I love. You have the humility and audacity to insist that you have nothing to do with my success—I hope, one day, you will realize how wrong you are.

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**Abstract**

Addressing Relative Criteria for *Miranda* Waivers: A Comparison of Juvenile Justice Youths' and Adult Offenders' Understanding and Appreciation of the Rights to Silence and Legal Counsel during Police Interrogations

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Concerns about juveniles' abilities to understand and appreciate their *Miranda* rights, as well as empirical evidence about juveniles' deficits in *Miranda* comprehension, are well documented in the legal and psychological literature. However, it has been over 30 years since juveniles' abilities relative to adults have been evaluated. In this study, juveniles' ( $n = 183$ ) and adults' ( $n = 103$ ) performance on the *Miranda Rights Comprehension Instruments* (MRCI) were compared, and the relationship between age and *Miranda* comprehension was evaluated across both samples. Results revealed that juveniles scored significantly lower than adults on all MRCI subtests and that age and *Miranda* comprehension had a meaningful, but not perfectly linear relationship. With respect to *Miranda* understanding, significant differences were observed between younger and older adolescents, with tapering improvement into adulthood. Significant improvements were observed on *Miranda* vocabulary and appreciation well into adulthood. Results are discussed in the context of neurological development and adolescents' developmental immaturity, specifically in terms of implications for greater *Miranda* waiver protections for juveniles and young adults during custodial interrogations.



## CHAPTER 1: BACKGROUND AND REVIEW OF THE LITERATURE

The jurisprudence surrounding juvenile interrogations and confessions has been evolving for several decades. In 1962, commenting on the interrogation of a 14-year-old boy, Justice Douglas described the problem inherent in interactions between juveniles and police: “[W]e deal with a person who is not equal to the police in knowledge and understanding of the consequences of the questions and answers being recorded and who is unable to know how to protect his own interests or how to get the benefits of his constitutional rights” (*Gallegos v. Colorado*, p. 54). Five years later, with *In re Gault*, the Supreme Court extended several due process protections, including the *Miranda* warnings, to juveniles. Paralleling the implications of *Miranda* for adult defendants, police must read and obtain valid waivers of the *Miranda* warnings to ensure the admissibility of juveniles’ statements at trial. And, like adults, juveniles’ *Miranda* waivers must be made knowingly, intelligently, and voluntarily to be valid.

Although a procedural victory, the *Gault* decision left many of the issues associated with juvenile interrogations and confessions unresolved. Since the decision, there have been numerous federal (e.g., *A.M. v. Butler*, *Fare v. Michael C.*, *West v. United States*) and state (e.g., *Commonwealth v. a Juvenile*, *Commonwealth v. King*, *Commonwealth v. Philip S.*) cases clarifying and elaborating on the law surrounding juvenile interrogations. One clear indication that law in this area is far from settled is the Supreme Court’s 2010 decision to grant certiorari in a juvenile *Miranda* case: *JDB v. North Carolina*.

While legal decisions have attempted to clarify how to adequately protect juveniles during interrogations, researchers have attempted to clarify the nature of

juveniles' interrogation-related abilities. Notably, and consistent with Justice Douglas's observations, decades of research have revealed significant deficits in juveniles' *Miranda* comprehension compared to what they should comprehend and to what other suspects typically comprehend (e.g., Goldstein, Condie, Kalbeitzler, Osman, & Geier, 2003; Grisso, 1981; Peterson-Badali, Abramovitch, Koegl, & Ruck, 1999).

### **1.1 Evaluating *Miranda* Comprehension: General Framework**

With few exceptions, judges evaluate the validity of adults' and juveniles' *Miranda* waivers based on the *totality of the circumstances* surrounding the interrogation (King, 2006).<sup>\*</sup> Using this approach, judges typically evaluate two sets of factors, one relating to characteristics of the suspect (e.g., age, intelligence, background, prior experience with police), and one relating to the characteristics of the interrogation (e.g., physical conditions of the interrogation and police conduct; Goldstein & Goldstein, 2010). These factors provide judges with an indirect indication about whether the *Miranda* waiver in question satisfied the requisite criteria (i.e., that the waiver was provided knowingly, intelligently, and voluntarily). It was not until Grisso published the *Instruments for Assessing Understanding and Appreciation of Miranda Rights* (1998) that a tool was available to assess *Miranda* comprehension directly; "understanding" represents the psychological equivalent of "knowing," and "appreciation" represents the psychological equivalent of "intelligent." Although this tool is inevitably used *after* an individual has waived his or her rights and, therefore, only provides an assessment of the individual's *current* *Miranda* comprehension (as opposed to *Miranda* comprehension at

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<sup>\*</sup> Some states have established *per se* rules requiring either that juveniles have an opportunity to consult with an interested adult prior to waiving their rights, or the presence of an interested adult during the interrogation of juveniles under a certain age. However, even in these states the totality of the circumstances approach is used to evaluate waivers made after consultation with, or in the presence of, an interested adult (see King, 2006).

the time of the waiver), it does provide more direct information about capacities involved in providing a valid *Miranda* waiver.

Grisso's instruments have become one of the most frequently used and widely accepted assessment tools for evaluating *Miranda* comprehension (Archer, Buffington-Vollum, Stredny, & Handel, 2006; Lally, 2003; Ryba, Brodsky, & Shlosberg 2007). The scoring criteria that the instruments provide allow an examinee's *Miranda* comprehension to be objectively evaluated against both absolute and relative criteria. Absolute criteria involve assessing how well an examinee understands and appreciates the core information contained in the warnings; relative criteria involve comparing an examinee's performance to that of other defendants or a community sample (Goldstein & Goldstein, 2010).

## **1.2 Evaluating *Miranda* Comprehension Using Absolute Criteria**

Much of the research on *Miranda* comprehension has used the absolute criteria model and focused on populations likely to have significant deficits, such as adults with intellectual disabilities (e.g., Fulero & Everington, 1995; O'Connell, Garmoe, & Goldstein, 2005) or mental illness (e.g., Cooper & Zapf, 2007), and juveniles. Juveniles' *Miranda* comprehension abilities, in particular, have received extensive attention (e.g., Colwell et al., 2005; Goldstein et al., 2003; Grisso, 1981). The results of Grisso's (1981) research revealed numerous deficits in juveniles' comprehension of the *Miranda* rights. For instance, nearly half (45%) of the juveniles in his study were unable to adequately explain the right to counsel; many believed that attorneys would only be available in court as opposed to before or during the interrogation. Additionally, almost one quarter (24%) of the juveniles provided an inadequate explanation of the second warning about

the intent to use statements in court; they often interpreted the warning to mean that disrespect or disobedience during the interrogation would lead to negative consequences.

Grisso's (1981) results regarding juveniles' appreciation of rights were similar. Whereas most participants understood the adversarial nature of interrogation, juveniles demonstrated poorer appreciation of the right to counsel and silence. While an overwhelming majority recognized the lawyer's role in creating a defense and understood the need to cooperate with a lawyer (80% and 92%, respectively), far fewer appreciated why a lawyer would need to know the truth from the suspect (67%). Many juveniles believed that lawyers would use that information to decide about the suspect's guilt and punishment, or that the lawyer would only defend someone who was innocent. Juveniles also demonstrated significant deficiencies in their appreciation of the right to silence. Nearly two-thirds of the juveniles (62%) thought they could be penalized for asserting the right to silence, and over half of the juveniles (55%) thought that the right to silence could be revoked by the judge.

Despite some speculation that 21<sup>st</sup> century juveniles might have better *Miranda* comprehension than their 1970s counterparts, research has revealed consistent deficits over time. The results of a 2003 study (Goldstein et al.) indicated that juveniles continue to have generally poor *Miranda* comprehension, with many participants misunderstanding the rights to silence and counsel. Regarding "rights" generally, juveniles tend to have a fundamental misconception that a right is something one is allowed to do instead of an entitlement (Grisso, 1997). Particularly in the context of the right to silence, juveniles believe that rights are conditional or can later be revoked by a judge (Goldstein et al., 2003; Grisso, 1997). In one study, 36% of the juveniles who

waived their right to silence or to speak with a parent during an actual interrogation reported believing that they had to waive those rights (Peterson-Badali et al., 1999). Juveniles may also have difficulty understanding and exercising the right to counsel because they often believe that lawyers only protect the innocent or that they will play a fact-finding role (Abramovitch, Peterson-Badali, & Rohan, 1995; Goldstein et al., 2003; Grisso, 1997). In one sample of juveniles who had been interrogated by police, 76% did not believe that they had access to a lawyer even though they remembered the police telling them that they had the right to “retain and instruct counsel without delay” (Peterson-Badali et al., 1999, p. 459).

Juveniles demonstrate consistent problems with appreciation as well. For instance, many children reveal flaws in their appreciation of the nature of confidentiality between suspects and their lawyers (Peterson-Badali, Abramovitch, & Duda, 1997). Nearly three-quarters (72%) of the youth in one study thought the lawyer could relate information to the police, 70% believed the lawyer could report information to the judge, and 84% believed the lawyer could share information with their parents. Results of a similar study suggested that few youth understood the implications of waiving their rights; only 58% realized they would be questioned by the police, and only two individuals realized the police would ask them to make a formal statement (Abramovitch, Higgins-Biss, & Biss, 1993).

One of the culprits for juveniles’ generally poor *Miranda* comprehension may be the warnings themselves. The complexity and grade level of general versions of the warnings vary widely across jurisdictions, with some warnings generating a Flesch-Kincaid reading level of 18 (Rogers, Harrison, Shuman, Sewell, & Hazelwood, 2007;



Rogers, Hazelwood, Sewell, Harrison, & Shuman, 2008). Juvenile warnings, although intended and designed to be simplified versions of the adult warnings, are not necessarily easier to understand. They are often longer than adult warnings, read at a more difficult level, and are characterized by similar vocabulary demands (Rogers et al., 2008).

Additionally, many jurisdictions provide only one version of the warning, regardless of the suspect's age (Rogers et al., 2007). Despite the linguistic complexity of the *Miranda* warnings, there is, nevertheless, growing evidence that juveniles, as a class, simply may not possess the conceptual abilities to understand the warnings, placing them at a unique disadvantage to adults regardless of the version of the warnings they hear or see (Goldstein et al., 2003). Despite this premise generated from results of many studies, no research has directly compared juveniles' understanding and appreciation of *Miranda* rights to that of adults since Grisso's (1981) original study. Such information is needed for three reasons, to provide: 1) judges with data to inform their decision-making about juvenile defendants' *Miranda* waivers using relative criteria, 2) normative data for modern *Miranda* comprehension assessment tools, and 3) data to inform policy decisions about special protections for juvenile offenders.

### **1.3 Evaluating *Miranda* Comprehension Using Relative Criteria**

Relative criteria allow an individual's *Miranda* comprehension to be compared to the average comprehension levels of different, relevant groups. For instance, an adult defendant's *Miranda* comprehension could be compared to the *Miranda* comprehension of an average adult defendant, or an average adult from a community sample. With juveniles, there is a wider array of possible groups for comparison, and each judge decides if and against which group he or she wishes to compare a particular defendant.

Juveniles' *Miranda* comprehension can be compared to that of other juvenile justice-involved youth or community adolescents. It can also be compared to the *Miranda* comprehension of adult offenders or adults in the community.

To date, comparisons between juvenile-justice involved youth and community youth reveal relatively few and minimal differences. Peterson-Badali and colleagues (1997; 1999) found few differences when they compared justice-involved youth and adolescents from the community. In their earlier study (1997), the justice-involved youth demonstrated poorer overall comprehension of their rights and the trial process: They were less likely to view a lawyer as an advocate, to correctly define a guilty plea, and to discuss key aspects of a trial. Results of the later study (1999) suggested that the understanding of justice-involved youth was comparable to that of high school students. More recent research revealed that, on a standardized measure of *Miranda* comprehension, a sample of middle to upper SES community youth performed better than a sample of juvenile justice youth (Goldstein, Zelle, & Grisso, 2011). Greater percentages of participants from the community sample were able to accurately explain the *Miranda* warnings in their own words, identify phrases that conveyed the same information as each *Miranda* statement, define key *Miranda* vocabulary, and convey an appreciation of the consequences of waiving their rights.

Juveniles' *Miranda* comprehension can also be compared to that of adults, a population that has demonstrated its own *Miranda* comprehension difficulties. For instance, Grisso (1981) found that only 41% of the adults in his sample were able to define "right" correctly, with 17% offering completely inadequate responses. Furthermore, approximately 23% of adults provided at least one inadequate response

when paraphrasing each of the rights contained in the *Miranda* warnings. Nevertheless, adults consistently performed better than juveniles when asked to paraphrase the *Miranda* warnings and define key *Miranda* vocabulary. Overall, adults were better able to understand the language used in the *Miranda* warnings and translate those warnings into their own words, but the discrepancy narrowed with older adolescents, particularly after age 16.

A similar pattern emerged when juveniles' appreciation of rights was compared to that of adults (Grisso, 1981). Although there were no significant differences between juveniles' and adults' appreciation of the adversarial nature of interrogation, juveniles ages 16 and above performed significantly better, and were more comparable to adults, than juveniles age 15 and below. Juveniles demonstrated markedly poorer appreciation of the right to silence than did adults. The 16-year-olds also performed significantly worse than adults ages 20 and above, suggesting that in the appreciation domain, performance may continue to improve into adulthood.

Juveniles' relative *Miranda* comprehension abilities are particularly relevant when one considers the fact that juveniles' *Miranda* waivers are most likely to be questioned when juveniles are in adult court. This probability exists for two reasons. First, zealous advocacy is not characteristic of attorneys in juvenile court (Drizin & Luloff, 2007). Myriad factors, most prominently excessive caseloads and juvenile court culture, undermine juveniles' due process protections. As a result, attorneys in juvenile court rarely file pretrial motions (Drizin & Luloff, 2007). When they do, the motions are frequently "boilerplate" and standard form pleadings (Jones, 2004), not suppression challenges under *Miranda*. Second, increasing numbers of juveniles are tried in adult

court (Kurlychek & Johnson, 2010). Reacting to rising juvenile crime rates in the 1980s, many states expanded their juvenile transfer laws. This led to a dramatic increase in the number of juveniles transferred to adult criminal court (Kurlychek & Johnson, 2010). In sum, the likelihood of juvenile *Miranda* waivers being challenged in adult court makes juveniles' *Miranda* comprehension, relative to adult offenders, particularly salient.

#### **1.4 Developmental Support for Relative Criteria**

Juveniles' abilities to understand and appreciate their *Miranda* rights relative to adults are also particularly relevant given developmental immaturity and neurological development research revealing that adolescents differ meaningfully from adults along multiple dimensions. More specifically, adolescents differ from adults with respect to independent functioning, decision making, emotion regulation, and general cognitive processing (Kemp et al., 2011). Independent functioning refers to both one's self-reliance (i.e., the ability to make autonomous decisions) and self-concept (i.e., clarity of values, recognizing personal strengths and weaknesses) (Caffman & Steinberg, 2000; Kemp et al., 2011). Thus, adolescents often struggle to make decisions that are independent of authority figures or friends and that are consistent with their personal values. In the context of decision making, adolescents are heavily influenced by social and emotional factors and are more likely to engage in sensation- and reward-seeking behaviors (Caffman & Steinberg, 2000; Steinberg, 2010). Emotion regulation also develops throughout adolescence and into adulthood, meaning that adolescents are less able to recognize and express their feelings, manage their emotions, or cope with undesirable feelings (Kemp et al., 2011). Finally, cognitive functioning continues to improve into adulthood; thus, adolescents are still developing in domains such as

reasoning, memory, processing speed, and verbal fluency (Klaczynski, 2001; Levin et al., 1991).

The psychological and social elements of developmental immaturity have neurological correlates. Results of longitudinal imaging studies revealed that the frontal lobes are not fully developed and are less active during adolescence (Gogtay et al., 2004; Rubia et al., 2000). Simultaneously, the limbic system is particularly active, increasing the salience of socio-emotional information (Rubia et al., 2000). The interaction between these two systems makes the adolescent brain particularly vulnerable to social and emotional cues in decision making and impulsive behavior because the underdeveloped frontal lobes are tasked with receiving and modulating transmissions from the active limbic system (Albert & Steinberg, 2011). Finally, changes to the dopaminergic system occur during adolescence, which has implications for how youth process rewards (Steinberg, 2010). Specifically, the system's projections to the mesolimbic area and prefrontal cortex increase during mid-and late-adolescence and then decrease. These changes may, in part, explain the increase in reward-seeking behavior observed among adolescents.

These neurologically based age differences in cognitive, social, emotional, and behavioral functioning are important in the context of *Miranda* comprehension for three reasons.

First, the foundation of adequate *Miranda* comprehension lies in basic cognitive skills, such as one's ability to define vocabulary words and hold key pieces of information in working memory (e.g., Levin et al., 1999). Second, because adults' reasoning abilities are often more abstract, this may place them at a relative advantage to juveniles as

*Miranda* comprehension is, in part, a conceptual skill (Baird & Fugelsang, 2004; Goldstein et al., 2003). Third, while developmental immaturity may not directly affect *Miranda* comprehension, certain components of this construct (e.g., independent functioning and emotion regulation) can influence how an adolescent understands and reasons about novel information in a new and stressful environment like an interrogation. Empirical evidence has shown that time-pressured decision making; the absence of consultation with an informed, objective adult; and heightened emotional arousal all detract from an adolescent's ability to engage in rational decision making (Steinberg, Cauffman, Woolard, Graham, & Banich, 2009). Imagine an adolescent whose basic understanding of her *Miranda* rights is intact: even for this adolescent, her under-developed independent functioning, poor emotion regulation abilities, and the pressure exerted by police officers could work in concert to interfere with her ability to appreciate how those rights could benefit her or the consequences of waiving those rights. Collectively, once these facets of developmental immaturity interact with the stressful context of an interrogation, this adolescent might also become more likely to comply with a police officer's implied request to waive her rights and provide inculpatory information.

The premise that juveniles are meaningfully different than adults has been accepted in legal contexts as well. Partially based on social science research, the Supreme Court created categorical rules exempting juveniles, as a class, from the most severe forms of punishment in *Roper v. Simmons* (capital punishment; 2005), *Graham v. Florida* (life without parole for non-homicide offenses; 2010), and *Miller v. Alabama* (mandatory life without parole; 2012). Recently, in *J.D.B. v. North Carolina* (2011), the Court held that the age of a child, when either known to police at the time of questioning

or “objectively apparent to a reasonable officer,” is relevant to the *Miranda* custody analysis (p. 2404). Although the Court did not provide a categorical protection for juveniles in this context, the majority’s analysis contained categorical language: “A child’s age is far ‘more than chronological fact.’ It is a fact that ‘generates commonsense conclusions about behavior and perception.’ Such conclusions apply broadly to children as a class” (p. 2403; internal citations omitted). In sum, this evidence suggests that the cognitive, psychosocial, and neurological limitations associated with adolescence are now part of case law, not just based in social science research.

## **CHAPTER 2: CURRENT STUDY**

### **2.1 Rationale**

This study compared juveniles’ and adults’ *Miranda* comprehension. In this way, much-needed data were obtained that will allow juveniles’ *Miranda* capacities to be evaluated using relative criteria and inform judges’ decision making. To date, multiple studies have revisited the issue of juveniles’ understanding of legal rights (e.g., Abramovitch et al., 1995; Colwell et al., 2005; Goldstein et al., 2003). However, juvenile-adult comparisons have been largely untouched since Grisso’s 1981 study, which used his original, now out-of-date instruments. Therefore, current, up-to-date information about adults’ *Miranda* comprehension abilities and juveniles’ relative performance are needed to inform evaluations of juveniles’ *Miranda* waivers, provide normative data for modern *Miranda* comprehension assessment tools, and guide policy decisions about whether special protections are needed for juveniles within the context of *Miranda* waivers.

## 2.2 Hypotheses

**Preliminary hypothesis.** It was predicted that adults would display significantly better *Miranda* understanding and appreciation than juveniles. This hypothesis was tested using the legal demarcation of adulthood (age 18) to separate the two groups, and differences on each of the four *Miranda* instruments (CMR-II, CMR-R-II, FRI, and CMV-II) were evaluated.

**Primary hypotheses.** It was hypothesized that age and *Miranda* understanding and appreciation will have a non-linear relationship. Specifically, it was expected that increases in *Miranda* understanding and appreciation will be greatest from early to middle adolescence (from approximately 12 to 16), and that increases will begin to taper from middle adolescence to early adulthood (from approximately 16 to 25). It was hypothesized that there will not be appreciable increases in *Miranda* understanding and appreciation after early adulthood. These hypotheses are based on: 1) findings from research on cognitive development (e.g., Jacobs-Quadrel, Fischhoff & Davis, 1993) revealing that, by approximately age 16, adolescents and adults do not meaningfully differ in their cognitive abilities, and 2) findings in the developmental neuroscience (e.g., Gogtay et al., 2004; Rubia et al., 2000) and developmental immaturity (e.g., Cauffman & Steinberg, 2000; Kemp et al., 2011) research suggesting that judgment and decision-making abilities continue to develop into adulthood. Thus, the more dramatic advances in *Miranda* comprehension that are expected to take place between 12 and 16 should mirror adolescents' developing cognitive abilities. The minor improvements during later adolescence and early adulthood that are predicted would reflect improvements in



psychosocial maturity that may influence how individuals are able to process and reason with information in a demanding situation. This hypothesis was also evaluated on each of the four *Miranda* instruments.

It was further hypothesized that differences in *Miranda* understanding and appreciation that exist between adolescents and adults are strongly related to age and are not a byproduct of differences in other totality of circumstances factors. Therefore, these differences will remain when controlling for: Verbal IQ score, academic achievement, and number of previous arrests.

## CHAPTER 3: METHOD

### 3.1 Participants

#### **Juveniles.**

Juvenile data came from a sample of 183 justice-involved youth (140 boys) across three sites: 1) a post-adjudication facility in Massachusetts (n = 55), 2) a Philadelphia detention center (n = 112), and 3) a short-term, post-adjudication facility in the Philadelphia area (n = 16). Youth were excluded from the study if they did not speak English fluently, had severe developmental disabilities, exhibited florid psychotic symptoms at the time of consent/assent or assessment, or had open cases involving confessions or challenges to *Miranda* waivers. No youth met exclusion criteria regarding English fluency, severe developmental disabilities, or psychotic symptoms.

In both Massachusetts and Pennsylvania, consent was sought directly from youth ages 18 and 19. For youth under 18, in Massachusetts, the Massachusetts Department of Youth Services provided consent for participants (the commonwealth had custody of post-adjudicated youth in residential facilities), and parents were contacted by mail and

invited to decline participation; no parents declined. In Pennsylvania, consent was sought from parents/legal guardians for youth under age 18. When parents/legal guardians could not be reached after a designated number of attempts, consent was waived and youth were assented in the presence of a participant advocate, a facility staff member (e.g., social worker, psychologist) who confirmed that the adolescent appeared to understand the assent process and voluntarily agreed to participate.

Participants' ages ranged from 11 to 19 years ( $M = 16.45$ ;  $SD = 1.72$ ). The sample was: 46.4% African American; 15.8% Caucasian; 15.8% Hispanic; 1.6% Asian; 11.5% other, including bi-racial; and 8.7% did not report ethnicity or race. Youths' self-reported offenses ranged from truancy to attempted murder, and they reported a mean of 4.69 previous arrests ( $SD = 3.50$ , range: 1-20). Forty-eight percent of youths reported they had never been read the *Miranda* warnings; the remainder estimated that they had been read the *Miranda* warnings an average of 1.42 times ( $SD = 2.44$ ; range: 0-13).

The average Verbal IQ (VIQ) of juvenile participants was 81.74 ( $SD = 12.08$ , range: 55-114). Regarding academic achievement, on average, juvenile participants demonstrated 5<sup>th</sup> grade reading abilities ( $M = 76.30$ ;  $SD = 17.05$ ) and 3<sup>rd</sup> grade listening comprehension abilities ( $M = 77.40$ ,  $SD = 13.31$ ).

### **Adults.**

The adult sample consisted of 103 (58 women) clients of the Defender Association of Philadelphia who were housed in either of two local correctional facilities. Parallel to the juvenile study's exclusion criteria, adults were excluded from the study if they did not speak English fluently, had an open criminal case (i.e., all appeals had not been exhausted or waived), had severe developmental disabilities, or exhibited florid

psychotic symptoms at the time of consent or assessment. Three individuals were excluded from the study (open criminal case,  $n = 1$ ; did not speak English fluently,  $n = 2$ ).

Participants' ages ranged from 21 to 65 years ( $M = 36.24$ ,  $SD = 9.71$ ). The sample was 52.9% African American, 21.2% Caucasian, 11.5% Hispanic, and 14.4% other, including more than one race or ethnicity. Adults' self-reported offenses ranged from technical violations of probation (e.g., missed appointment) to aggravated assault, and they reported a mean of 10.99 previous arrests ( $SD = 8.36$ ; range: 1-40). Sixty percent of adult participants' reported they had never been read the *Miranda* warnings; the remainder estimated that they had been read the *Miranda* warnings an average of 2.32 times ( $SD = 2.42$ ; range: 0-10).

Adult participants produced a mean VIQ of 82.16 ( $SD = 13.80$ , range: 49-110). Regarding academic achievement, on average adults demonstrated 5<sup>th</sup> grade reading comprehension ( $M = 81.39$ ,  $SD = 16.67$ ) and 6<sup>th</sup> grade listening comprehension ( $M = 78.05$ ,  $SD = 13.48$ ) abilities.

### **3.2 Measures**

To foster comparison, the assessment battery for the adults was designed to correspond to the assessment battery previously completed by the juvenile participants. Certain exceptions, noted below, were made to accommodate either revised versions of specific instruments or age-appropriate measures.

*Miranda Rights Comprehension Instruments (MRCI)* (Goldstein, Zelle, & Grisso, 2012)

This measure is the revised version of the *Instruments for Assessing Understanding and Appreciation of Miranda Rights* (Grisso, 1998). It consists of four instruments.

(1) *Comprehension of Miranda Rights-II (CMR-II)*. This instrument measures an examinee's understanding of the *Miranda* rights. The examiner shows each written warning and reads the five *Miranda* warnings aloud; the examinee is asked to explain each right in his or her own words. Using standardized criteria and inquiries, the examiner rates the response as adequate (2 points), questionable (1 point), or inadequate (0 points). Total scores can range from 0 to 10.

(2) *Comprehension of Miranda Rights-Recognition-II (CMR-R-II)*. This instrument measures the examinee's ability to recognize and correctly identify sentences that have the same meaning as or a different meaning from each of the *Miranda* warnings. There are three sentences for each of the five warnings; correct responses receive 1 point; incorrect responses receive 0 points. Total scores can range from 0 to 15.

(3) *Comprehension of Miranda Vocabulary-II (CMV-II)*. This instrument measures the examinee's understanding of sixteen words used in the *Miranda* warnings. The examiner reads each word, uses the word in a sentence, and reads the word again. Then, the examinee is asked to define the word. Similar to the *CMR*, the examiner rates responses as adequate (2 points), questionable (1 point), or inadequate (0 points). Total scores can range from 0 to 32.

(4) *Function of Rights in Interrogation (FRI)*. This instrument assesses appreciation of *Miranda* rights by asking the examinee to respond to questions about four legally relevant vignettes. Fifteen questions are used to assess the following three subscales: (1) Nature of Interrogation (NI), (2) Right to Counsel (RC), and (3) Right to Silence (RS). Consistent with the *CMR* and *CMV*, the examiner rates responses as adequate (2 points), questionable (1 point), or inadequate (0 points). Total scores can

range from 0 to 30.

Psychometric analyses indicated that each individual instrument obtained acceptable levels of reliability and validity with juvenile offenders and community youth samples (Goldstein et al., 2011; Goldstein, Zelle, & Grisso, 2011). These analyses indicated that the instruments are internally consistent, with Cronbach's alpha values ranging from .54 to .75 in the juvenile justice sample, and .55 to .70 in the community sample. Test-retest reliability (evaluated among the juvenile justice sample only) ranged from .53 to .84; inter-rater reliability among trained raters was also high, with intraclass correlation coefficients (ICCs) ranging from .87 to .96.

The validity of the MRCI has also been well-documented (Goldstein et al., 2011; Goldstein, Zelle, & Grisso, 2012). The content validity of the instruments is supported by their design -- they were developed based on language used in actual *Miranda* warnings. Criterion validity is supported by similar levels of performance on Grisso's original instruments and the MRCI, and their convergent validity has been documented through significant correlations between the MRCI measures and age, IQ, and academic achievement in both juvenile justice and community youth samples.

*Wechsler Abbreviated Scale of Intelligence- Second Edition (WASI-II)*

Adult participants completed the verbal subtests of the *WASI-II* (The Psychological Corporation, 2011), the Vocabulary and Similarities subscales. The juvenile participants completed the verbal subtests of the first edition of the *WASI*. Verbal IQ (VIQ) score correlates highly with Performance IQ (PIQ; The Psychological Corporation, 1999) and VIQ is more relevant to and more strongly associated with *Miranda* comprehension (Colwell et al., 2005).

Test-retest reliability of *WASI* VIQ scores is high ( $r = .92$ ), as is inter-rater reliability (Vocabulary,  $r = .98$ , Similarities,  $r = .99$ ) (The Psychological Corporation, 1999). The content and construct validity of the *WASI* have been established (The Psychological Corporation, 1999).

*Wechsler Individual Achievement Test- Third Edition (WIAT-III)*

Adult participants completed the Reading Comprehension and Listening Comprehension subtests of the *WIAT-III* (The Psychological Corporation, 2009), a standardized measure of academic achievement. The juvenile participants completed these subtests on the first edition of the *WIAT*. Test-retest reliability of the different composite scores is: Reading ( $r = .93$ ), Language ( $r = .78$ ), Writing ( $r = .94$ ). Inter-rater reliability has not been calculated for the Spelling subtest because of the objective scoring criteria. Inter-rater reliability of both the Reading and Listening Comprehension subtests was  $r = .98$ . The content and construct validity of the *WIAT-III* also have been well documented (The Psychological Corporation, 2009).

*Gudjonsson Suggestibility Scales 2 (GSS 2)*

All participants completed the *GSS 2* (Gudjonsson, 1987), a measure of interrogative suggestibility. Administration of the *GSS 2* allows for the calculation of two distinct components of interrogative suggestibility: yield, the extent to which individuals give in to leading questions; and shift, the number of times a participant changes his or her response after being presented with negative feedback. The two-factor structure of the *GSS 2* has been documented, and research suggests the instrument is internally consistent, with alpha coefficients ranging from .79 to .90 for the different scales (Gudjonsson, 1992).

### *Brief Symptom Inventory (BSI)*

Adult participants completed the *BSI* (Derogatis & Melisaratos, 1993), a self-report inventory used to assess psychological symptoms. The *BSI* measures nine symptom categories (somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism), and provides three global indices (global severity index, positive symptom distress index, and positive symptom total). Research suggests acceptable levels of reliability, including internal consistency (Cronbach's alpha ranges from .71 to .85) and test-retest (coefficient ranges from .68 to .91) (Derogatis & Melisaratos, 1993). Additionally, the convergent and construct validity of the *BSI* have been documented when used as a measure of general psychopathology and distress (Boulet & Boss, 1991; Derogatis & Melisaratos, 1993).

### *Massachusetts Youth Screening Instrument-2 (MAYSI-2)*

Juvenile participants completed the *MAYSI-2* (Grisso & Barnum, 2003), a brief screening instrument designed to assess the mental health needs of adolescents in the juvenile justice system. It includes seven subtests: Alcohol/Drug Use, Angry-Irritable, Depressed-Anxious, Somatic Complaints, Suicide Ideation, Thought Disturbance, and Traumatic Experiences. Research suggests acceptable levels of reliability, including internal consistency (Cronbach's alpha ranges from .55 to .90 across scales) and test-rest (coefficient ranges from .60 to .82) (Archer, Stredny, Mason, & Arnau, 2004).

Concurrent validity of the *MAYSI-2* has been established (Grisso Barnum, Fletcher, Cauffman, & Peuschold, 2001).

### *Demographic Questionnaire*

A demographic questionnaire was used to collect basic demographic information (e.g., age, race and ethnicity, highest grade completed), legal history (e.g., history of arrest and detention), and *Miranda* history (e.g., whether participants had discussed the *Miranda* warning with their lawyers, recollection of the *Miranda* warning).

### **3.3 Procedure**

Juvenile data were collected previously through individual testing at the facilities described above. Potential adult participants were approached based on the lists of eligible individuals provided by the Defender Association of Philadelphia. On an individual basis, study personnel met with potential participants to provide a brief description of the study and obtained informed consent from those who agreed to participate.

For both studies, trained research assistants (RAs) administered the assessment batteries. Training for RAs consisted of 1) attending didactic sessions that covered administration rules for all instruments 2) practice administration of the assessment battery with a peer, 3) practice administration of the assessment battery with an upper-level graduate student, 4) observing an upper-level graduate student administer the battery to a study participant, and 5) supervised administration of the assessment battery to a study participant on at least one (for graduate RAs) or two (for undergraduate RAs) occasions.

The assessment battery was administered individually in a quiet location in each of the designated facilities. The battery typically required between three and four hours to complete; most youth completed the battery across two sessions, and approximately half of the adults completed the battery across two or more sessions.



Multiple steps were taken to protect juvenile participants' data, and similar measures were used to protect the data of adult participants. First, a Federal Certificate of Confidentiality was obtained for the juvenile data and was used to avoid compelled, involuntary disclosure of participants' information; however, the application for a Federal Certificate of Confidentiality was denied for adults due to a determination that the study did not fall within the NIH mission areas. Juveniles were excluded from participation if they had open cases involving confessions or challenges to *Miranda* waivers, and adults were excluded if they had any open cases or appeals. Finally, neither juvenile nor adult participants' names are connected to their data; data are identified only through an assigned identification number.

### **3.4 Method of Analysis**

Prior to evaluating hypotheses, I conducted preliminary analyses to test assumptions (e.g., homogeneity of variance, normality) of the planned analyses. All hypotheses were evaluated on each of the four *Miranda* instruments (CMR-II, CMR-R-II, FRI, and CMV-II).

Initially, the 18 and 19 year olds from the adult system and the juvenile system were to be compared on each of the four *Miranda* instruments to determine whether to aggregate their data or keep them separate; however, there were no 18 or 19 year olds in the adult sample, and, therefore, these analyses did not need to be conducted. The preliminary hypothesis of total score differences based on juvenile or adult status was evaluated with four independent samples t-tests, one per MRCI instrument. The primary hypothesis regarding the non-linear relationship between age and *Miranda* comprehension was evaluated by regressing *Miranda* understanding and appreciation on

the natural log of age [ $\ln(\text{age})$ ]. These analyses were repeated controlling for VIQ, academic achievement, and number of previous arrests. Supplemental analyses, using Analyses of Covariance (ANCOVA) were also conducted using age as a categorical variable (covariates were selected from the set of significant predictor variables in the regression analyses) to evaluate subtle yet meaningful differences in *Miranda* understanding and appreciation that occur with age. Pairwise comparisons were conducted with Bonferroni-corrected alpha values to reduce the chances of Type I error. Age groups were selected to balance two goals: mirroring groups from previous studies that found meaningful age-related differences, and creating groups that were similar in size. As a result, the following age groups were used: 12-14, 15-16, 17-18, 19-23, 24-30, 31 and above. Ideally, the 19-20 year old participants would have been evaluated separately given the potential for relevant policy implications regarding the treatment of individuals within this age group as juveniles or adults (e.g., juvenile courts can retain jurisdiction beyond age 18 for disposition purposes). Unfortunately, there were an insufficient number of participants in this age range ( $n = 14$ ) to form a meaningful group.

Effect sizes are reported for all analyses. Cohen's  $d$  was interpreted using the following norms: small = .2, medium = .5, large = .8;  $f^2$  using: small = .02, medium = .15, large = .35 (Cohen, 1988); and partial eta-squared using: small = .01, medium = .06, large = .14 (Field, 2005).

A sample of 103 adults and 183 youth ( $N = 286$ ), with an alpha of .05 and a medium effect size ( $d = .5$ ) produced a power of .98 for the preliminary analyses (i.e., t-tests). An alpha of .05 and a medium effect size ( $f^2 = .15$ ) produced a power greater than

.99 for the primary analyses (i.e., multiple regression with five predictors). Therefore, significant differences should have been detected in the current study if they existed.

The results of a factor analysis of the MRCI suggested that understanding (i.e., CMR-II, CMR-R-II) and appreciation (i.e., FRI) are separate domains, with vocabulary comprehension (i.e., CMV-II) loading on both constructs (Zelle et al., 2008). Thus, vocabulary comprehension has been conceptualized as a prerequisite for both understanding and appreciation of one's *Miranda* rights. In this paper, results regarding the CMV-II will be presented first, followed by results for the understanding measures (CMR-II, CMR-R-II) and, finally, results for the appreciation measure (FRI).

## CHAPTER 4: RESULTS

### 4.1 Preliminary Analyses

Regarding assumptions of the planned analyses, Levene's test for equality of variance indicated that the assumption of homogeneity of variance was satisfied for all comparisons. Visual inspection of the data (i.e., histograms, standardized residual plots, and scatterplots) indicated that the data were normally distributed without notable outliers. Correlations between predictor variables (i.e., age, VIQ, academic achievement, and previous arrests) did not exceed .7, and tolerance statistics were within acceptable ranges for all variables, indicating no significant multicollinearity.

Overall, adults produced higher mean scores than juveniles on each of the four *Miranda* instruments (CMV-II, CMR-II, CMR-R-II, and FRI; see Table 1). Four independent samples t-tests revealed that these differences were statistically significant: CMV-II,  $t(281) = -8.24, p < .01, d = 1.02, 95\% \text{ CI } [.76, 1.27]$ ; CMR-II,  $t(282) = -5.84, p < .01, d = .73, 95\% \text{ CI } [.47, .97]$ ; CMR-R-II,  $t(281) = -4.43, p < .01, d = .55, 95\% \text{ CI }$

[.30, .79]; FRI,  $t(269) = -5.90, p < .01, d = .75, 95\% \text{ CI } [.48, .97]$ . Notably, the difference between adult and juvenile scores was the greatest on the CMV-II.

#### **4.2 Differences between Juveniles and Adult Offenders' Understanding and Appreciation of *Miranda* Rights**

##### **CMV-II.**

When CMV-II scores were regressed on  $\ln(\text{age})$ , results revealed that  $\ln(\text{age})$  was a significant predictor,  $b = 5.33, SE = .76, p < .01$ , explaining approximately 15% of the variance in CMV-II scores. When CMV-II scores were regressed simultaneously on  $\ln(\text{age})$ , VIQ, reading comprehension, listening comprehension, and number of previous arrests, VIQ, reading comprehension, and listening comprehension emerged as significant predictors,  $b_{VIQ} = .14, SE_{VIQ} = .03, p_{VIQ} < .01, f^2_{VIQ} = .11, 95\% \text{ CI } [.04, .19]$ ;  $b_{RC} = .09, SE_{RC} = .02, p_{RC} < .01, f^2_{RC} = .10, 95\% \text{ CI } [.03, .18]$ ;  $b_{LC} = .06, SE_{LC} = .03, p_{LC} = .02, f^2_{LC} = .02, 95\% \text{ CI } [-.01, .05]$ . Neither  $\ln(\text{age})$ ,  $b = 1.88, SE = .143, p = .19, f^2 = .01, 95\% \text{ CI } [-.01, .03]$ , nor previous arrests,  $b = .01, SE = .04, p = .86, f^2 = .002, 95\% \text{ CI } [-.008, .012]$ , predicted CMV-II scores. This model explained approximately 60% of the variance in CMV-II scores ( $R^2 = .61; R^2_{\text{Adj.}} = .60$ ). When this model was replicated on the juvenile and adult data separately, results revealed that, among juveniles,  $\ln(\text{age})$ , VIQ, reading comprehension, and listening comprehension predicted CMV-II total scores. Among adults, only VIQ and reading comprehension were significant predictors. These models are summarized in Table 2.

Age group differences were evaluated with an independent measures ANCOVA, with VIQ and reading comprehension entered as covariates<sup>†</sup>. Results revealed that some

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<sup>†</sup> Because VIQ and reading comprehension were the most robust predictors across analyses, they were used as covariates in all ANCOVAs.

age groups scored significantly higher on the CMV-II than did others,  $F(5, 222) = 25.75$ ,  $p < .01$ ,  $\eta_p^2 = .37$ . See Table 3 for each age group's mean scores. Pairwise comparisons revealed that the over 30 age group scored significantly higher than the 12-14, 15-16, 17-18, and 19-23 groups, and that the 24-30 group scored significantly higher than each of the younger age groups. The 19-23 group scores were not significantly different from any of the younger age groups. Age group differences are depicted in Figure 1.

### **Understanding.**

#### ***CMR-II.***

When CMR-II scores were regressed on  $\ln(\text{age})$ , results revealed that  $\ln(\text{age})$  was a significant predictor,  $b = 1.88$ ,  $SE = .36$ ,  $p < .01$ . However, this model accounted for only 9% of the variability in CMR-II scores. When  $\ln(\text{age})$ , VIQ, reading comprehension, listening comprehension, and number of previous arrests were simultaneously entered into the regression equation, VIQ, reading comprehension, and listening comprehension emerged as significant predictors:  $b_{VIQ} = .05$ ,  $SE_{VIQ} = .02$ ,  $p_{VIQ} < .01$ ,  $f^2_{VIQ} = .04$ , 95% CI [-.004, .088];  $b_{RC} = .05$ ,  $SE_{RC} = .01$ ,  $p_{RC} < .01$ ,  $f^2_{RC} = .10$ , 95% CI [.03, .18];  $b_{LC} = .03$ ,  $SE_{LC} = .01$ ,  $p_{LC} = .04$ ,  $f^2_{LC} = .02$ , 95% CI [-.01, .05]. Neither  $\ln(\text{age})$ ,  $b = 1.38$ ,  $SE = .75$ ,  $p = .06$ ,  $f^2 = .02$ , 95% CI [-.01, .05], nor number of previous arrests,  $b = .01$ ,  $SE = .02$ ,  $p = .56$ ,  $f^2 = .01$ , 95% CI [-.01, .03], significantly predicted CMR-II scores. This model accounted for approximately 45% of the variance in CMR-II scores ( $R^2 = .46$ ;  $R^2_{\text{Adj.}} = .45$ ). Analysis of this model was then replicated, first using only the juvenile data, and then using only the adult data. Among juveniles,  $\ln(\text{age})$ , VIQ, and reading comprehension were significant predictors; among adults, only VIQ and reading

comprehension significantly predicted CMR-II scores. These two models are summarized in Table 4.

When differences among the six age groups were evaluated using an independent measures ANCOVA, with VIQ and reading comprehension as covariates, results revealed that specific age groups obtained significantly higher CMR-II scores than others,  $F(5, 222) = 12.23, p < .01, \eta_p^2 = .22$ . See Table 3 for mean scores for each age group.

Pairwise comparisons revealed that the over 30 age group scored significantly higher than the 12-14, 15-16, and 17-18 groups; the 12-14 age group scored significantly lower than each of the other age groups. Differences among age groups are depicted in Figure 2.

### ***CMR-R-II.***

When CMR-R-II scores were regressed on  $\ln(\text{age})$ , results revealed that  $\ln(\text{age})$  was a significant predictor,  $b = 1.36, SE = .30, p < .01$ , but explained only 6% of the variance in CMR-R-II scores. When the  $\ln(\text{age})$ , VIQ, reading comprehension, listening comprehension, and number of previous arrests were simultaneously entered into the regression equation,  $\ln(\text{age})$ , VIQ, and reading comprehension significantly predicted CMR-R-II scores,  $b_{\text{age}} = 1.53, SE_{\text{age}} = .67, p_{\text{age}} = .02, f^2_{\text{age}} = .02, 95\% \text{ CI } [-.01, .05]$ ;  $b_{\text{VIQ}} = .05, SE_{\text{VIQ}} = .01, p_{\text{VIQ}} < .01, f^2_{\text{VIQ}} = .07, 95\% \text{ CI } [.01, .14]$ ;  $b_{\text{RC}} = .03, SE_{\text{RC}} = .01, p_{\text{RC}} = .02, f^2_{\text{RC}} = .01, 95\% \text{ CI } [-.01, .03]$ . Neither listening comprehension,  $b = .01, SE = .01, p = .55, f^2 = .01, 95\% \text{ CI } [-.01, .03]$ , nor number of previous arrests,  $b = .02, SE = .02, p = .98, f^2 = .01, 95\% \text{ CI } [-.01, .03]$ , significantly predicted CMR-R-II scores. This model explained approximately 33% of the variance in CMR-R-II scores ( $R^2 = .35; R^2_{\text{Adj.}} = .33$ ). When analysis of this model was replicated with the juvenile and adult data separately, both  $\ln(\text{age})$  and VIQ independently predicted CMR-R-II scores among juvenile

participants, but only VIQ was a significant predictor among adults. See Table 5 for full results of these analyses.

Age group differences in CMR-R-II performance were evaluated with an independent measures ANCOVA, with VIQ and reading comprehension as covariates. Results revealed significant differences among age groups,  $F(5, 222) = 8.61, p < .01, \eta_p^2 = .16$ . See Table 3 for mean scores for each age group. Pairwise comparisons revealed that, as with CMR-II scores, the over 30 age group scored significantly higher than the 12-14, 15-16, and 17-18 groups. The 12-14 age group scored significantly lower than each adult age groups (i.e., 19-23, 24-30, >30). Differences among age groups are depicted in Figure 3.

### **Appreciation.**

#### ***FRI.***

When FRI scores were regressed on  $\ln(\text{age})$ , results revealed that  $\ln(\text{age})$  was a significant predictor,  $b = 3.17, SE = .53, p < .01$ , but explained only 12% of the variance in FRI scores. When FRI scores were regressed on  $\ln(\text{age})$ , VIQ, reading comprehension, listening comprehension, and number of previous arrests simultaneously,  $\ln(\text{age})$ , VIQ, and reading comprehension emerged as significant predictors,  $b_{\text{age}} = 3.99, SE_{\text{age}} = 1.24, p_{\text{age}} < .01, f^2_{\text{age}} = .05, 95\% \text{ CI } [.001, .105]; b_{\text{VIQ}} = .06, SE_{\text{VIQ}} = .03, p_{\text{VIQ}} = .02, f^2_{\text{VIQ}} = .02, 95\% \text{ CI } [-.01, .05]; b_{\text{RC}} = .06, SE_{\text{RC}} = .02, p_{\text{RC}} < .01, f^2_{\text{RC}} = .07, 95\% \text{ CI } [.01, .14]$ . Neither listening comprehension,  $b = .02, SE = .02, p = .35, f^2 = .001, 95\% \text{ CI } [-.006, .008]$ , nor number of previous arrests,  $b = .01, SE = .04, p = .82, f^2 = .001, 95\% \text{ CI } [-.006, .008]$ , significantly predicted FRI scores. Overall, this model explained approximately 32% of the variance in FRI scores ( $R^2 = .33; R^2_{\text{Adj.}} = .32$ ). When this model testing was

replicated using the juvenile and adult data separately, results revealed that, among juveniles,  $\ln(\text{age})$ , reading comprehension, and listening comprehension significantly predicted FRI scores. Among adults,  $\ln(\text{age})$  and VIQ were significant predictors. These models are summarized in Table 6.

Results of the independent measures ANCOVA, which included VIQ and reading comprehension as covariates, revealed significant differences in FRI scores by age group,  $F(5, 222) = 10.76, p < .01, \eta_p^2 = .20$ . See Table 3 for mean scores for each age group. Pairwise comparisons revealed that the over 30 group scored significantly higher than the 12-14, 15-16, 17-18, and 19-23 groups, and that the 24-30 group scored significantly higher than the 12-14 group. Age group differences are depicted in Figure 4.

## CHAPTER 5: DISCUSSION

Overall, results revealed a general dichotomy between juveniles and adults in the vocabulary, understanding, and appreciation domains of *Miranda* comprehension, with adults demonstrating significantly better abilities in each domain. The precise relationship between age and *Miranda* comprehension, however, is more complex. Results suggest that age and *Miranda* comprehension have a meaningful, but not perfectly linear, relationship. First, the role of age appears to play a different role among juveniles than it does among adults. Age seems to influence all facets of *Miranda* comprehension (i.e., vocabulary, understanding, and appreciation) among juveniles, but, among adults, age had the strongest relationship with *Miranda* appreciation. Second, considerable gains in the understanding domain were observed during mid-adolescence (i.e., 12-16 years), with minimal improvement during adulthood. However, in the vocabulary and appreciation domains, the development of *Miranda*-related abilities



looked different -- gains in these areas occurred well into adulthood (i.e., after the age of 23).

These results offer some insight into how *Miranda* comprehension evolves with age. There appears to be a period of improvement in the understanding of one's *Miranda* rights that occurs at the same time cognitive abilities are continuing to develop and crystallize, suggesting that the understanding component is partially a cognitive skill. Notably, though, there were improvements across all domains well into adulthood, particularly in the appreciation domain. These improvements suggest that factors other than cognitive skills are influencing the ability to appreciate one's *Miranda* rights. Thus, while *Miranda* understanding shows a relatively steep increase in adolescence that approaches a plateau in early adulthood, *Miranda* appreciation shows more gradual improvement well into adulthood.

Collectively, these results are consistent with general neurological development and increasing maturity with age (e.g. Albert & Steinberg, 2011; Cauffman & Steinberg, 2000; Steinberg, 2010). By roughly age 16, the brain is able to engage in logical reasoning that underlies one's ability to derive the basic meaning of a series of statements (i.e., understanding one's rights; Jacobs-Quadrel, Fischhoff, & Davis, 1993; Overton, 1990). In contrast, the portions of the brain supporting vocabulary have a more protracted course of maturation than other regions (Sowell et al., 2003). Further, both the structures (i.e., prefrontal cortex) and interconnections (e.g., dopaminergic system) that facilitate improved executive functioning and decrease emotionally driven, reward-seeking behavior continue to develop into adulthood as well (Albert & Steinberg, 2011; Gogtay et al., 2004). Thus, the ability to apply rights to a particular context, recognize

the consequences of waiving or invoking one's rights, and modulate one's emotional experience in a stressful situation improve as neurological development supports independent functioning, future orientation, and emotion regulation.

### **5.1 Implications**

Juveniles' deficits in *Miranda* comprehension relative to adults support policy developments that would offer protections to juveniles, as a class, in the context of *Miranda* waivers. In this study, juveniles demonstrated deficiencies in all domains of *Miranda* comprehension when compared to adults. Of particular relevance to these policy decisions are findings in the vocabulary and appreciation domains—not only did all juvenile age groups show considerable impairments relative to adults, young adults also demonstrated these relative deficits. Thus, in these two domains, young adults look more like juveniles than adults. These findings are of particular concern because vocabulary has been conceptualized as an ability that is necessary for both understanding and appreciation of one's rights (Goldstein et al., 2012; Zelle et al., 2008). Therefore, specialized vocabulary deficits likely have widespread effects on one's ability to interpret and reason with the complex verbal information contained in the *Miranda* warnings. And, because appreciation concerns how individuals apply the rights to their own situations, deficits in this higher order skill may result in waivers executed without the realization that continued interrogation, and possibly detention and criminal adjudication, may follow.

Thus, not only do results of this study, in combination with historic findings (e.g., Abramovitch et al., 1993; Ferguson & Douglas, 1970; Grisso 1981), suggest that protections are needed for juveniles, these results also suggest that young adults might

benefit from additional protections when interacting with law enforcement and the justice system. Taken broadly, these findings support policy movements designed to keep older juveniles—and, potentially, even young adults—within the jurisdiction of the juvenile justice system. Examples include juvenile courts retaining jurisdiction beyond the 18<sup>th</sup> birthday for disposition purposes, and the “raise the age” movement in which juvenile courts have been expanding the original jurisdiction of juvenile courts in delinquency matters to age 18 (e.g., Juvenile Justice Initiative, 2014; Office of Juvenile Justice and Delinquency Prevention, 2003).

The results regarding juveniles’ and young adults’ *Miranda* comprehension deficits can also be used to inform trainings for law enforcement or judges. Trainings could emphasize the nature of these deficits and the development of *Miranda* comprehension with age. For law enforcement officers, the practical aspects of these trainings might focus on suggestions for delivery of the warnings, allowing opportunities for questions, emphasizing the right to counsel, and circumstances in which delaying or rejecting a juvenile’s *Miranda* waiver might be appropriate. For judges, these trainings could provide a framework for evaluating juveniles’ *Miranda* waivers (e.g., younger juveniles warrant more caution, particularly with respect to basic understanding of their rights) and whether adult-based, totality of the circumstances case law should be applied to a juvenile if his understanding or appreciation of the warnings is meaningfully different than that of the average adult offender.

The adult data generated by this study also provide a basis for using adult-based relative criteria when evaluating juveniles’ *Miranda* comprehension. This may be particularly relevant when juveniles are being tried in adult court, a trend that has been

increasingly common since the 1980s (Kurlychek & Johnson, 2010). Further, because *Miranda* waiver evaluations focus on the totality of the circumstances surrounding the interrogation, the procedures used during the interrogation are particularly relevant—and in many jurisdictions these procedures do not differ meaningfully for juvenile and adult suspects (Meyer & Reppucci, 2007). Further, although juvenile courts handle dispositions differently than criminal courts, they are not necessarily considering *Miranda* waivers differently, evaluating the same totality of circumstances factors (King, 2006). Therefore, arguably, youths' *Miranda* comprehension is not being held to a different standard in juvenile and criminal court, and a juvenile's MRCI performance relative to the average adult offender could be relevant in either setting.

It is important to note, however, that using adult-based relative criteria when evaluating a juvenile's *Miranda* comprehension does not obviate the need to use absolute criteria as well. For instance, simply because a juvenile's MRCI scores are lower than the average adult offender's does not mean that her *Miranda* comprehension is necessarily insufficient for the purposes of executing a valid waiver. Alternatively, simply because a juvenile's MRCI scores are equal to or greater than the average adult offender's does not mean that her *Miranda* comprehension is necessarily sufficient. In both of these cases, the juvenile's abilities need to be evaluated in an absolute sense as well to help judges make informed rulings about *Miranda* waiver capacity.

Beyond age, results of this study also demonstrate that other key totality of the circumstances factors, particularly VIQ and reading comprehension, play important roles in how well both juveniles and adults comprehend their *Miranda* rights. The relationship between *Miranda* comprehension and listening comprehension was mixed, however.

These results may reflect the fact that the majority of the MRCI stimuli are both written and oral and, therefore, do not necessarily place a high demand on participants' listening comprehension abilities. In the context of forensic mental health assessments, these results suggest that assessments of VIQ would be almost universally indicated when evaluating an individual's *Miranda* waiver capacity, and that assessments of reading comprehension would be indicated if the warnings were presented in a written format. Alternatively, the relevance of assessing listening comprehension may depend on both individual and interrogation-related factors. A listening comprehension assessment would be more relevant when defendants' reading comprehension abilities are very poor, placing a higher demand on their listening comprehension abilities, or if law enforcement administered the *Miranda* rights orally, without giving the defendant an opportunity to read them.

The results of this study also have interesting implications given recent Supreme Court decisions. In *Berghuis v. Thompkins* (2010), the Court held that post-*Miranda* silence does not constitute an invocation of *Miranda* rights and that responding to police questions is a "course of conduct indicating waiver" of those rights (p. 2263). In other words, waivers of *Miranda* rights can be implicit. This new decision can be interpreted as an elaboration on what it means to appreciate one's *Miranda* rights. For instance, with respect to the right to silence, does one appreciate that this right does not operate until it is explicitly invoked? Regarding the nature of interrogation, does one appreciate that law enforcement officers will proceed with adversarial questioning unless there is a specific and explicit invocation of one's rights? Given that even young adults in this study demonstrated some deficits in the appreciation domain, there are questions about whether

many suspects appreciate their rights in ways that are consistent with these newly specified Supreme Court expectations.

In *Florida v. Powell* (2010), the Supreme Court reaffirmed that courts do not need to scrutinize the language used to convey the *Miranda* warnings. The Court's opinion emphasized that the language at issue did not "entirely omit" the required information (p. 1204). Once again, deficits in juveniles' and young adults' appreciation observed in this study suggest that suspects in these age groups may have difficulty drawing inferences about their rights when important pieces of information are partially omitted. For instance, suspects hearing the version of the warnings at issue in *Powell* would have to infer that they have the right to counsel *during* questioning when only told that they have the right to counsel *before* questioning. While this does not require a dramatic inferential leap, it places a greater burden on suspects who are attempting to comprehend complex verbal information in a stressful situation.

## **5.2 Limitations**

It is noteworthy that, although the core totality of the circumstances variables were included in this study and were often statistically significant predictors of *Miranda* understanding or appreciation, a substantial portion of the variance in *Miranda* understanding and appreciation remained unexplained in each analysis. Therefore, other, unmeasured variables are contributing in important ways to *Miranda* comprehension. For instance, important elements of prior experience with the justice system that were not captured in the "number of previous arrests" variable (e.g., number of hours spent with an attorney, Viljoen & Roesch, 2005) may influence *Miranda* comprehension. Further,

participants' effort was not objectively assessed in this study, which also could have affected the results.

An additional limitation of the current study involves the sample size for specific age groups. Although the overall sample size provided adequate statistical power for the analyses, there were a minimal number of 12 and 13-year-old participants and no data were collected from participants younger than 12 years; there also were a limited number of participants in certain age ranges of particular interest, such as 19-20 year olds, who, in some legal contexts (e.g., continuing jurisdiction of juvenile courts for disposition purposes), can be treated as juveniles and, in other contexts (e.g., original jurisdiction in adult criminal court), are treated as adults. Further, while observed improvements in *Miranda* comprehension across age groups are consistent with developmental maturation, the construct of developmental (im)maturity was not measured in this study. Therefore, these results do not provide direct information about how developmental immaturity is related to *Miranda* comprehension; the conclusions described above are inferential. And, while we are drawing conclusions about the evolution of *Miranda* comprehension with age, these conclusions are drawn from a cross-sectional, not a longitudinal, design.

Additionally, only VIQ data were collected in this study; other aspects of intelligence were not measured, largely due to time constraints and previous research suggesting that VIQ is a more important predictor of *Miranda* comprehension than PIQ (e.g., Colwell et al., 2005). Future research should explore whether other aspects of intelligence (e.g., working memory) affect *Miranda* comprehension. And, while the results from this study support the general notion of providing protections to juveniles given their deficits in *Miranda* comprehension relative to adults, these results do not

provide evidence for the types of protections that would benefit juveniles. Future research could evaluate whether different presentations of the *Miranda* warnings (e.g., written, oral, written and oral together), or an intervention framework (e.g., an advocate explaining the *Miranda* warnings) might improve juveniles' *Miranda* comprehension within the context of an interrogation.

### 5.3 Conclusions

As *Miranda v. Arizona* (1966) approaches its fiftieth birthday, empirical psychological research continues to provide new information about comprehension of the *Miranda* warnings. It is unlikely that the Court realized the complexity of the information contained in the warnings and the multitude of ways in which individuals might fail to meet the knowing, intelligent, and voluntary waiver requirements. The results of this study can be added to the line of research beginning in the 1970s, not long after the *Miranda* decision, demonstrating that individuals, particularly children and adolescents, likely have impairments in their understanding and appreciation of the *Miranda* warnings. These results provide further support for the assertion that juveniles' *Miranda* comprehension is categorically lower than adults'. There is also emerging evidence that *Miranda* comprehension continues to improve well into adulthood, possibly the result of a constellation of factors including neurological development and psychosocial abilities.

It is noteworthy that, as psychological research continues to shed light on the nuances of *Miranda* comprehension, the Supreme Court has taken multiple opportunities over the last five years to revisit the *Miranda* doctrine. Although the basic holding remains intact, the Court has placed a greater burden on suspects to invoke their rights



(*Berghuis v. Thompkins*, 2010; *Salinas v. Texas*, 2013) while making the custody analysis, a threshold issue for determining whether the *Miranda* warnings are even read, increasingly contextual (*Howes v. Fields*, 2012; *Maryland v. Shatzer*, 2010). These holdings have interesting implications for clinical practice and research, and should serve as an impetus to continue investigations into how age and other totality of the circumstances factors may influence *Miranda* comprehension.

## List of References

1. Abramovitch, R., Higgins-Biss, K.L., & Biss, S.R. (1993). Young persons' comprehension of waivers in criminal proceedings. *Canadian Journal of Criminology*, 35, 309-322.
2. Abramovitch, R., Peterson-Badali, M., & Rohan, M. (1995). Young people's understanding and assertion of their rights to silence and legal counsel. *Canadian Journal of Criminology*, 37, 1-18.
3. Albert, D. & Steinberg, L. (2011). Judgment and decision making in adolescence. *Journal of Research on Adolescence*, 21, 211-224. doi: 10.1111/j.1532-7795.2010.00724.x
4. *A.M. v. Butler*, 360 F.3d 787 (7th Cir. 2004).
5. Archer, R.P., Buffington-Vollum, J.K., Stredny, R.V., Handel, R.W. (2006). A survey of psychological test use patterns among forensic psychologists. *Journal of Personality Assessment*, 87, 84-94. doi: 10.1207/s15327752jpa8701\_07
6. Baird, A. A. & Fugelsang, J. A. (2004). The emergence of consequential thought: evidence from neuroscience. *Philosophical Transactions of the Royal Society B*, 359, 1797-1804. doi:10.1098/rstb.2004.1549
7. *Berghuis v. Thompkins*, 560 U.S. 370 (2010).
8. Boulet, J. & Boss, M.W. (1991). Reliability and validity of the Brief Symptom Inventory. *Psychological Assessment*, 3, 433-437. doi: 10.1037/1040-3590.3.3.433
9. Cauffman, E. & Steinberg, L. (2000). (Im)maturity of judgment in adolescence: Why adolescents may be less culpable than adults. *Behavioral Sciences & the Law*, 18, 741-760. doi: 10.1002/bsl.416
10. Cohen, J. (1988). *Statistical Power Analysis for the Behavior Sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.
11. Colwell, L.H., Cruise, K.R., Guy, L.S., McCoy, W.K., Fernandez, K., Ross, H.H. (2005). The influence of male juvenile offenders' comprehension and understanding of the *Miranda* warning. *The Journal of the American Academy of Psychiatry and the Law*, 33, 444-454.
12. *Commonwealth v. a Juvenile*, 449 N.E.2d 654 (Mass. 1983).
13. *Commonwealth v. King*, 460 N.E.2d 1299 (Mass. App. 1984).

14. *Commonwealth v. Philip S.*, 611 N.E.2d 226 (Mass. 1993).
15. Cooper, V.G. & Zapf, P.A. (2007). Psychiatric patients' comprehension of *Miranda* rights. *Law and Human Behavior*, 32, 390-405. doi: 10.1007/s10979-007-9099-3
16. Derogatis, L.R. & Melisaratos, N. (1993). The Brief Symptom Inventory: An introductory report. *Psychological Medicine*, 13, 595-605. doi: 10.1017/S0033291700048017
17. Drizin, S.A. & Luloff, G. (2007). Are juvenile courts a breeding ground for wrongful convictions? *Northern Kentucky Law Review*, 34, 257-322.
18. *Fare v. Michael C.*, 442 U.S. 707 (1979).
19. Ferguson, B. & Douglas, A.C. (1970). A study of juvenile waiver. *San Diego Law Review*, 7, 39-54.
20. Field, A. P. (2005). *Discovering statistics using SPSS* (2<sup>nd</sup> edition). London: Sage.
21. Frick, R.W. (1995). Accepting the null hypothesis. *Memory and Cognition*, 23, 132-138.
22. Fulero, S. M. & Everington, C. (1995). Assessing competency to waive *Miranda* rights in defendants with mental retardation. *Law and Human Behavior*, 19, 533-543. doi: 10.1007/BF01499342
23. *Gallegos v. Colorado*, 370 U.S. 49 (1962).
24. Gogtay, N., Giedd, J.N., Lusk, L., Hayashi, K.M., Greenstein, D., Vaituzis, A.C. . . . Thompson, P.M. (2004). Dynamic mapping of human cortical development during childhood through early adulthood. *Proceedings of the National Academy of Sciences*, 101, 8174-8179. doi: 10.1073/pnas.0402680101
25. Goldstein, N.E.S., Condie, L.O., Kalbeitzer, R., Osman, D., & Geier, J.L. (2003). Juvenile offenders' *Miranda* rights comprehension and self-reported likelihood of offering false confessions. *Assessment*, 10, 359-369. doi: 10.1177/1073191103259535
26. Goldstein, A. & Goldstein, N.E.S. (2010). *Evaluating Capacity to Waive Miranda Rights*. New York, NY: Oxford University Press.
27. Goldstein, N.E.S., Riggs Romaine, C.L., Zelle, H., Kalbeitzer, R., Mesiarik, C., & Wolbransky, M. (2011). Psychometric properties of the *Miranda Rights Comprehension Instruments* with a juvenile justice sample. *Assessment*, 18, 428-441. doi: 10.1177/1073191111400280

28. Goldstein, N.E.S., Zelle, H., & Grisso T. (2012). *The Miranda Rights Comprehension Instruments*. Sarasota, FL: Professional Resource Press.
29. *Graham v. Florida*, 130 S. Ct. 2011 (2010).
30. Grisso, T. (1981). *Juveniles' Waiver of Rights: Legal and Psychological Competence*. New York: Plenum Press.
31. Grisso, T. (1997). The competence of adolescents as trial defendants. *Psychology, Public Policy, and Law*, 3, 3-32. doi: 10.1037/1076-8971.3.1.3
32. Grisso, T. (1998). *Instruments for assessing understanding and appreciation of Miranda Rights*. Sarasota, FL: Professional Resources Press.
33. Grisso, T., & Barnum, R. (2003). *Massachusetts Youth Screening Instrument-Version 2 (MAYSI-2): User's manual and technical report*. Sarasota, FL: Professional Resource Press.
34. Grisso, T., Barnum, R., Fletcher, K. E., Cauffman, E., & Peuschold, D. (2001). Massachusetts Youth Screening Instrument for mental health needs of juvenile justice youths. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 541-548.
35. Gudjonsson, G.H. (1987). A parallel form of the Gudjonsson Suggestibility Scale. *British Journal of Clinical Psychology*, 26, 215-221. doi: 10.1111/j.2044-8260.1987.tb01348.x
36. Gudjonsson, G.H. (1992). Interrogative suggestibility: Factor analysis of the Gudjonsson Suggestibility Scale (GSS-2). *Personality and Individual Differences*, 13, 479-481. doi: 10.1016/0191-8869%2892%2990077-3
37. *Howes v. Fields*, 132 S. Ct. 1181(2012).
38. *In re Gault*, 387 U.S. 1 (1967).
39. Jacobs-Quadrel, M., Fischhoff, B., & Davis, W. (1993). Adolescent (in)vulnerability. *American Psychologist*, 48, 102-116. doi: 10.1037/0003-066X.48.2.102.
40. *J.D.B. v. North Carolina*, 131 S. Ct. 2394 (2011).
41. Jones, J.B. (2004). Access to counsel. *Juvenile Justice Bulletin*. Washington, D.C.: Office of Juvenile Justice and Delinquency Prevention. Retrieved from <https://www.ncjrs.gov/pdffiles1/ojjdp/204063.pdf>

42. Juvenile Justice Initiative (2014). *Raise the age*. Retrieved from: <http://jjustice.org/juvenile-justice-issues/raise-the-age/>
43. Kemp, K., Goldstein, N.E.S., Zelle, H., Viljoen, J., Heilbrun, K., & DeMatteo, D. (2011). Characteristics of developmental immaturity: A cross-disciplinary survey of psychologists. Manuscript submitted for publication.
44. King, K.J. (2006). Waiving childhood goodbye: How juvenile courts fail to protect children from unknowing, unintelligent, and involuntary waivers of *Miranda* rights. *Wisconsin Law Review*, 2006, 431-477.
45. Klaczynski, P.A. (2001). Framing effects on adolescent task representations, analytic and heuristic processing and decision making. Implications for the normative/descriptive gap. *Journal of Applied Developmental Psychology*, 22, 289-309. doi: 10.1016/S0193-3973%2801%2900085-5
46. Kurlychek, M.C. & Johnson, B.D. (2010). Juvenility and punishment: Sentencing juveniles in adult criminal court. *Criminology: An Interdisciplinary Journal*, 48, 725-758. doi: 10.1111/j.1745-9125.2010.00200.x
47. Lally, S.J. (2003). What tests are acceptable for use in forensic evaluations? A survey of experts. *Professional Psychology: Research and Practice*, 34, 491-498. doi: 10.1037/0735-7028.34.5.491
48. Levin, H.S., Culhane, K.A., Harmann, J., & Evankovich, K. (1991). Developmental changes in performance on tests of purported frontal lobe functioning. *Developmental Neuropsychology*, 7, 377-395. doi: 10.1080/87565649109540499
49. *Maryland v. Shatzer*, 130 S.Ct. 1213 (2010).
50. Meyer, J.R. & Reppucci, N.D. (2007). Police practices and perceptions regarding juvenile interrogation and interrogative suggestibility. *Behavioral Sciences and the Law*, 25, 757-780. doi: 10.1002/bsl.774
51. *Miller v. Alabama*, 132 S.Ct. 2455 (2012).
52. *Miranda v. Arizona*, 384 U.S. 436 (1966).
53. O'Connell, M.J., Garmoe, W., & Goldstein, N.E.S. (2005). *Miranda* comprehension in adults with mental retardation and the effects of feedback style on suggestibility. *Law and Human Behavior*, 29, 359-369. doi: 10.1007/s10979-005-2965-y

54. Office of Juvenile Justice and Delinquency Prevention (2003). *Juveniles in Court*. Retrieved from:  
<https://www.ncjrs.gov/html/ojjdp/195420/contents.html#ack>
55. Overton W. 1990. Competence and procedures: Constraints on the development of logical reasoning. In *Reasoning, Necessity, and Logic: Developmental Perspectives*, Overton, W. (ed.). Erlbaum: Hillsdale, NJ; 1-32.
56. The Psychological Corporation (1992). *Wechsler Individual Achievement Test*. San Antonio, TX: Author.
57. The Psychological Corporation (1999). *Wechsler Abbreviated Scale of Intelligence*. San Antonio, TX: Author.
58. The Psychological Corporation (2009). *Wechsler Individual Achievement Test-Third Edition*. San Antonio, TX: Author.
59. The Psychological Corporation (2011). *Wechsler Abbreviated Scale of Intelligence- Second Edition*. San Antonio, TX: Author.
60. Peterson-Badali, M., Abramovitch, R., & Duda, J. (1997). Young children's legal knowledge and reasoning ability. *Canadian Journal of Criminology & Corrections*, 39, 145-170.
61. Peterson-Badali, M., Abramovitch, R., Koegl, C., & Ruck, M.D. (1999). Young people's experience of the Canadian youth justice system: Interacting with police and legal counsel. *Behavioral Sciences and the Law*, 17, 455-465. doi: 10.1002/%28SICI%291099-0798%28199910/12%2917:4%3C455::AID-BSL358%3E3.0.CO;2-R
62. Rogers, R., Harrison, K.S., Shuman, D.W., Sewell, K.W., & Hazelwood, L.L. (2007). An analysis of *Miranda* warnings and waivers: Comprehension and coverage. *Law and Human Behavior*, 31, 177-192. doi: 10.1007/s10979-006-9054-8
63. Rogers, R., Hazelwood, L.L., Sewell, K.W., Shuman, D.W., & Blackwood, H.L. (2008). The comprehensibility and content of juvenile *Miranda* warnings. *Psychology, Public Policy, and Law*, 14, 63-87. doi: 10.1037/a0013102
64. *Roper v. Simmons*, 543 U.S. 551 (2005).
65. Rubia, K., Overmeyer, S., Taylor, E., Brammer, M., Williams, S.C., Simmons, A., . . . Bullmore, E.T. (2000). Functional frontalisation with age: Mapping Neurodevelopmental trajectories with fMRI, *Neuroscience & Biobehavioral Reviews*, 24, 13-19: doi: 10.1016/S0149-7634(99)00055-X

66. Ryba, N.L., Brodsky, S.L., & Shlosberg, A. (2007). Evaluations of capacity to waive *Miranda* rights: A survey of practitioners' use of the Grisso instruments. *Assessment, 14*, 300-309. doi: 10.1177/1073191110730284
67. *Salinas v. Texas*, 133 S. Ct. 2174 (2013).
68. Sowell, E.R., Peterson, B.S., Thompson, P.M., Welcome, S.E., Henkenius, A.L., & Toga, A.W. (2003). Mapping cortical change across the human life span. *Nature Neuroscience, 6*, 309-315. doi: 10.1038/nm1008
69. Steinberg, L. (2010). A dual systems model of adolescent risk-taking. *Developmental Psychobiology, 52*, 216-224.
70. Steinberg, L., Cauffman, E., Woolard, J., Graham, S., & Banich, M. (2009). Are adolescents less mature than adults? Minors' access to abortion, the juvenile death penalty, and the alleged APA "Flip-Flop." *American Psychologist, 64*, 583-594. doi: 10.1037/a0014763
71. Viljoen, J.L. & Roesch, R. (2005). Competence to waive interrogation rights and adjudicative competence in adolescent defendants: Cognitive development, attorney contact, and psychological symptoms. *Law and Human Behavior, 29*, 723-742. doi: 10.1007/s10979-005-7978-y
72. *West v. United States*, 399 F.2d 467 (5th Cir. 1968).

Table 1

*Juveniles' and Adults' Mean Performance on the MRCI*

	Juveniles <i>M (SD)</i> <i>n</i> = 183	Adults <i>M (SD)</i> <i>n</i> = 103	Total <i>M (SD)</i> <i>N</i> = 286
CMV-II	20.24 (5.17)	25.51 (5.15)	22.14 (5.74)
CMR-II	6.26 (2.57)	8.03 (2.24)	6.90 (2.59)
CMR-R-II	11.82 (2.11)	12.97 (2.09)	12.23 (2.17)
FRI	23.55 (3.71)	26.24 (3.50)	24.56 (3.85)



Table 2

*CMV-II: Simultaneous Multiple Regression Values among Juveniles and Adults*

	$R^2$	$R^2_{Adj.}$	$b$	$SE_b$	Predictor $f^2$
Model 1 (Juveniles only)	.53	.51			
Ln(age)			6.78*	3.15	.04
VIQ			.17**	.04	.15
Reading Comp.			.07*	.03	.02
Listening Comp.			.08*	.03	.04
Previous arrests			.12	.09	.02
Model 2 (Adults only)	.49	.46			
Ln(age)			.71	1.60	.01
VIQ			.13**	.04	.13
Reading Comp.			.11**	.04	.12
Listening Comp.			.01	.04	.01
Previous arrests			-.04	.05	.02

\* $p < .05$ , \*\* $p < .01$

Table 3

*Mean Scores on MRCI Instruments by Age Group*


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	CMV-II	CMR-II	CMR-R-II	FRI
12-14	19.53 (5.54)	5.47 (2.56)	11.44 (2.27)	23.13 (3.28)
15-16	20.31 (4.34)	6.72 (2.57)	12.02 (2.08)	23.78 (3.66)
17-18	20.45 (5.65)	6.59 (2.30)	12.11 (1.78)	23.97 (4.00)
19-23	21.13 (6.67)	7.33 (3.02)	12.60 (2.44)	23.67 (4.62)
24-30	26.95 (3.35)	8.33 (2.13)	13.52 (1.63)	26.43 (2.56)
>30	25.82 (5.08)	8.10 (2.32)	13.33 (1.95)	26.93 (3.30)

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*Note.* Data are presented in the format  $M(SD)$ .

Table 4

*CMR-II: Simultaneous Multiple Regression Values among Juveniles and Adults*

	$R^2$	$R^2_{Adj.}$	$b$	$SE_b$	Predictor $f^2$
Model 1 (Juveniles only)	.45	.43			
Ln(age)			6.24**	1.70	.11
VIQ			.06**	.02	.07
Reading Comp.			.05**	.02	.07
Listening Comp.			.03	.02	.02
Previous arrests			-.003	.05	.01
Model 2 (Adults only)	.38	.35			
Ln(age)			.04	.77	.01
VIQ			.05*	.02	.06
Reading Comp.			.04*	.02	.06
Listening Comp.			.02	.02	.01
Previous arrests			.009	.02	.01

\* $p < .05$ , \*\* $p < .01$

Table 5

*CMR-R-II: Simultaneous Multiple Regression Values among Juveniles and Adults*

	$R^2$	$R^2_{Adj.}$	$b$	$SE_b$	Predictor $f^2$
Model 1 (Juveniles only)	.30	.28			
Ln(age)			4.74**	1.55	.07
VIQ			.07**	.02	.10
Reading Comp.			.03	.02	.01
Listening Comp.			-.004	.02	-.01
Previous arrests			.03	.04	.01
Model 2 (Adults only)	.33	.28			
Ln(age)			.64	.71	.01
VIQ			.04*	.02	.07
Reading Comp.			.02	.02	-.04
Listening Comp.			.03	.02	.01
Previous arrests			.02	.02	.01

\* $p < .05$ , \*\* $p < .01$

Table 6

*FRI: Simultaneous Multiple Regression Values among Juveniles and Adults*

	$R^2$	$R^2_{Adj.}$	$b$	$SE_b$	Predictor $f^2$
Model 1 (Juveniles only)	.27	.24			
Ln(age)			6.45*	2.83	.04
VIQ			.04	.04	.01
Reading Comp.			.06*	.03	.03
Listening Comp.			.06*	.03	.04
Previous arrests			-.03	.08	.01
Model 2 (Adults only)	.26	.21			
Ln(age)			3.31*	1.32	.08
VIQ			.09*	.04	.09
Reading Comp.			.05	.03	.08
Listening Comp.			-.04	.03	.01
Previous arrests			.004	.04	.01

\* $p < .05$ , \*\* $p < .01$

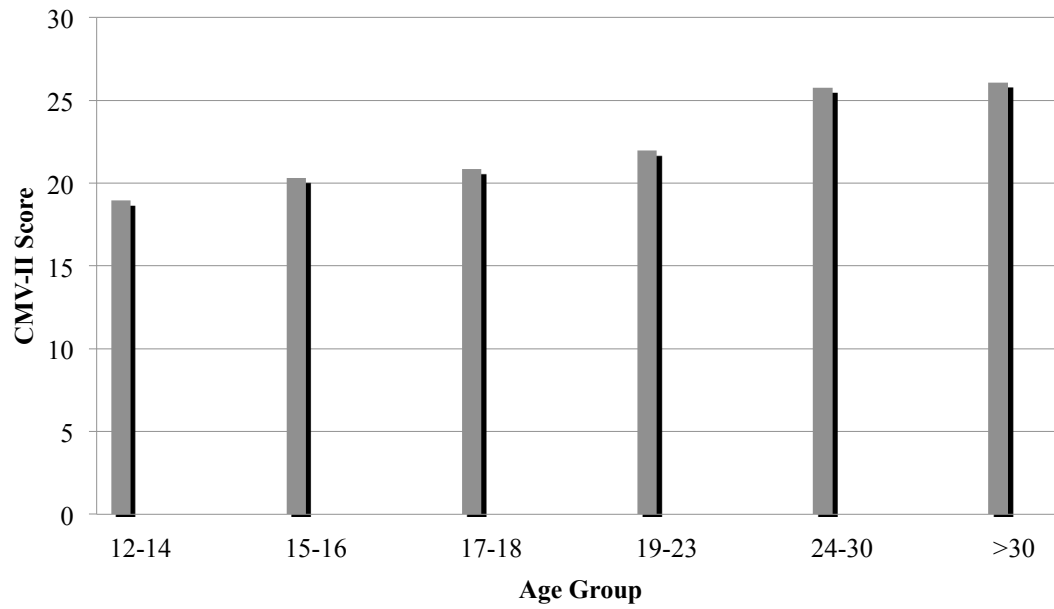


Figure 1. Mean performance on CMV-II by age group.

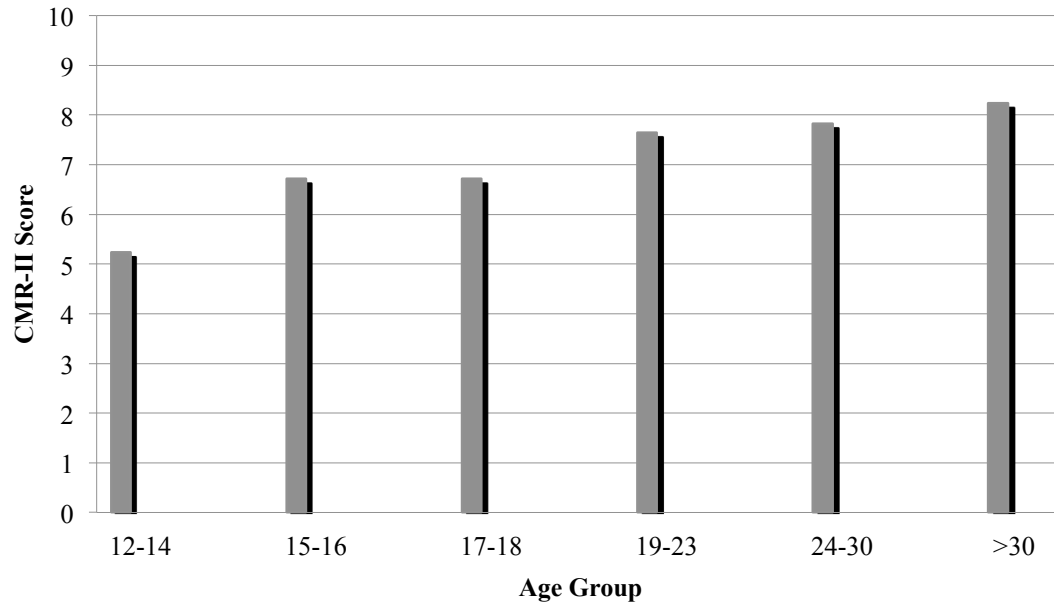


Figure 2. Mean performance on CMR-II by age group.

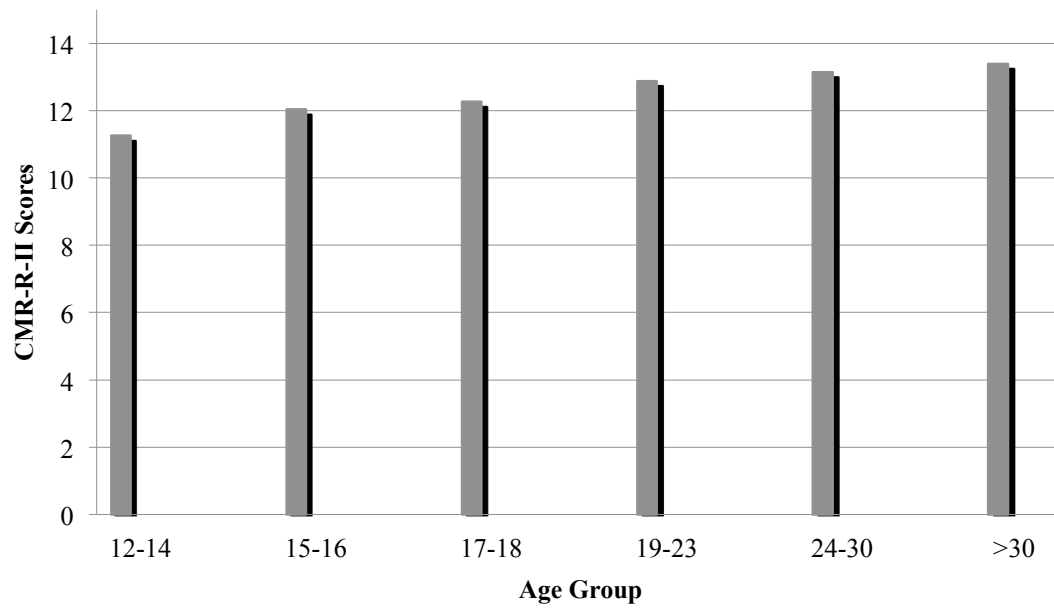


Figure 3. Mean performance on CMR-R-II by age group.



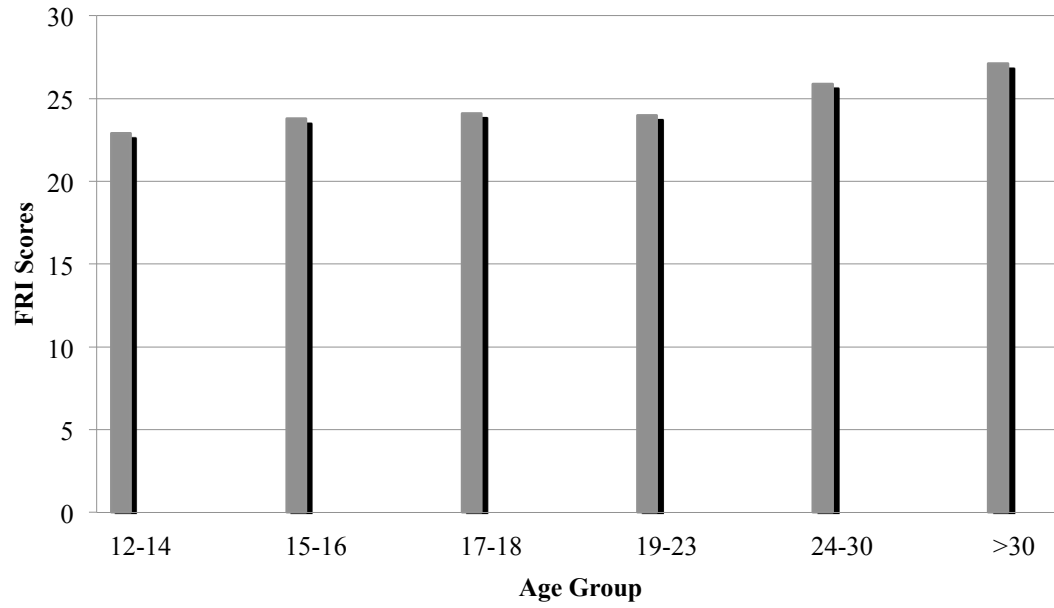


Figure 4. Mean performance on FRI by age group.

## Vita

### Sharon Kelley

Sharon Kelley is a seventh year JD/PhD student on internship at the University of Massachusetts Medical School/Worcester Recovery Center and Hospital. Her research interests include juveniles' and adults' comprehension of *Miranda* rights, capacities relevant to the guilty plea process, and forensic assessment of juveniles and adults. She defended her dissertation entitled "Addressing Relative Criteria for *Miranda* Waivers: A Comparison of Juvenile Justice Youths' and Adult Offenders' Understanding and Appreciation of the Rights to Silence and Legal Counsel during Police Interrogations" in May 2014 and expects to meet the requirements of the doctoral degree in August 2014. She has clinical experience with adults and adolescents in inpatient, outpatient, and forensic settings. She also has experience working on mental health and juvenile justice policy. After internship, Sharon will complete a post-doctoral fellowship at the University of Virginia. Sharon earned her B.A. in Psychology from St. Mary's College of Maryland in 2006, her M.S. in Clinical Psychology from Drexel University in 2010, and her J.D. from Villanova University School of Law in 2011.

### Publications

- Goldstein, N.E.S., **Messenheimer Kelley, S.**, Peterson, L., Brogan, L., Zelle, H., & Riggs Romaine, C.L. (in press). Evaluation of Miranda Waiver Capacity. In K. Heilbrun, D. DeMatteo, & N.E.S. Goldstein (Eds.), *APA Handbook of Psychology and Juvenile Justice*.
- Heilbrun, K., **Messenheimer Kelley, S.**, Present Koller, J., Lane, C., & Peterson, L. (2013). Community-Based Forensic Services: The Role of the University-Based Clinic. *International Journal of Law and Psychiatry, 36*, 195-200.
- Levick, M., Feierman, J., **Messenheimer Kelley, S.**, Goldstein, N.E.S., & Mordecai, K. (2012). An Evolving Eighth Amendment Jurisprudence: Defining Cruel and Unusual Punishment Through the Lens of Childhood and Adolescence. *University of Pennsylvania Journal of Law and Social Change, 15*, 285-321.
- Goldstein, N.E.S., **Messenheimer Kelley, S.**, Riggs Romaine, C.L., & Zelle, H. (2012). Potential Impact of Juvenile Suspects' Linguistic Abilities on *Miranda* Understanding and Appreciation. In P. Tiersman & L. Solan (Eds.), *Oxford Handbook on Linguistics and Law*. New York: Oxford University Press.
- Cox, J.M., Goldstein, N., Dolores, J., Zelechowski, A., & **Messenheimer, S.** (2012). The Impact of Juveniles' Ages and Levels of Psychosocial Maturity on Judges' Opinions about Adjudicative Competence. *Law and Human Behavior, 36*, 21-27.

### Teaching Experience

- Drexel University**, Adjunct Faculty April 2013-June 2013  
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- Law Course: Juvenile Justice Seminar

### Academic Honors and Awards

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Cum Laude, Villanova University School of Law (2011)  
Magna Cum Laude, St. Mary's College of Maryland (2006)  
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