Factor Structure of the *Miranda Rights Comprehension Instruments—II*

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To my mother and grandmother.
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Abstract
Factor Structure of the Miranda Rights Comprehension Instruments-II
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A waiver of *Miranda* rights is valid only if a suspect provides it knowingly, intelligently, and voluntarily. The *Instruments for Assessing Understanding and Appreciation of Rights* were created with the goal of assessing individuals’ basic understanding of the *Miranda* rights (i.e., the knowing prong) and their appreciation of waiving those rights (i.e., the intelligent prong). The revised instruments, the *Miranda Rights Comprehension Instruments-II*, maintain that goal. It has been hypothesized that the component instruments load on two factors that comprise the knowing and intelligent requirements. The two-factor structure has been partially supported by product-moment correlations; however, a direct statistical analysis of the hypothetical structure has not been completed.

The current study examined the factor structure of the *MRCI-II*. It was hypothesized that a two-factor model would provide the best fit, with the *CMR-II, CMR-R-II* and *CMV-II* loading on a factor constituting the understanding requirement and the *FRI* loading on a separate factor constituting the appreciation requirement. Data were collected from 183 adolescent boys and girls in pre- and post-adjudication facilities in Pennsylvania and Massachusetts. The *MRCI-II*, verbal sections of the *WIAT* and *WASI*, and Gudjonsson *Suggestibility Scale -2* were administered to participants. Exploratory factor analysis revealed a two-factor model with the *CMR-II* and *CMR-R-II* loading on Factor 1, the *FRI* loading on Factor 2, and the *CMV-II* loading on Factors 1 and 2. Confirmatory factor analyses indicated the two-factor model provided a good fit to the data, as did a one-factor model, whereas a three-factor model provided a poor fit.
CHAPTER 1: BACKGROUND AND LITERATURE SURVEY

1.1 Miranda Warnings Overview

The *Miranda* warnings were established by the 1966 United States Supreme Court ruling, *Miranda v. Arizona*, as safeguards for suspects against self-incrimination and police intimidation. The warnings inform suspects of the right to silence, the intent to use their statements against them in court, the right to an attorney, and the right to a court appointed attorney for indigent suspects. These rights can be waived by suspects; however, such a waiver is considered valid only if a suspect provides it knowingly, intelligently, and voluntarily. That is to say, a waiver is valid if the suspect understands the basic meaning of the *Miranda* rights, appreciates the consequences of waiving those rights, and provides the waiver without police coercion or intimidation (Grisso, 1981).

1.2 Miranda Instruments

The *Instruments for Assessing Understanding and Appreciation of Miranda Rights* (Grisso, 1998) are a battery of four instruments that assess individuals’ capacities to understand and appreciate the *Miranda* warnings. The instruments were originally developed as a standardized research tool. The instruments were intended to assess the understanding and appreciation of rights by adolescents and to compare adolescents’ results with the understanding and appreciation of rights by adults. Ultimately, they were to be used by researchers to inform public policy. For example, early research with the instruments sought to examine the veracity of commonly accepted circumstances considered in rights waiver cases (Grisso, 1981).

Current use of the instruments extends beyond research into forensic assessment of *Miranda* comprehension. The *Instruments for Assessing Understanding and
Appreciation of Miranda Rights are frequently used by psychologists as the primary tool for evaluating individual defendant’s Miranda comprehension, along with other practices, such as gathering relevant records and interviewing the defendant (Oberlander & Goldstein, 2001).

Examinees’ scores on the instruments can be interpreted in comparison to an absolute or relative standard of understanding. A minimal absolute standard of understanding, as described by Grisso (1981), does not allow for any inadequate responses (i.e., item responses which receive a score of zero). A higher absolute standard can be used that requires all adequate responses on a given instrument. Further, a relative standard can be used that compares adolescents’ scores to those of the average adult, the average same-aged peer, or the average youth involved with the legal system.

The first instrument, Comprehension of Miranda Rights (CMR), assesses an examinee’s understanding of the basic meaning of each of the Miranda warnings by asking the examinee to explain the meaning of each warning in his or her own words. The Comprehension of Miranda Rights – Recognition (CMR-R) assesses an examinee’s understanding of each Miranda warning without relying on the individual’s verbal expressive skills. Instead, the CMR-R presents three pre-constructed sentences for each Miranda warning that examinees must recognize as identical to or different in meaning from the Miranda warning. The Function of Rights in Interrogation (FRI) instrument assesses the examinee’s appreciation of the significance of Miranda rights in interrogation and legal proceedings by asking the examinee about fictional legal scenarios. The Comprehension of Miranda Vocabulary (CMV) assesses an examinee’s understanding of legal vocabulary often used in Miranda warnings by asking the
examinee to define six words.

1.3 Legal Challenges/Decisions

The *Miranda* instruments, generally, have received positive responses in court. In many cases, expert testimony that has relied on *Miranda* assessment with the instruments has been implicitly or explicitly accepted by the courts (e.g., *United States v. Jackson* (2006); *Commonwealth v. Woods* (2004); *State v. Caldwell* (1992)). In *Commonwealth v. Woods* (2004), the court decided upon a defendant’s motion to suppress his statements to police. The defendant argued that he had not knowingly and voluntarily waived his rights because he had been under the influence of alcohol and OxyContin at the time. Expert testimony was given on the defendant’s behalf. The expert administered the *Miranda* instruments to the defendant, fully explained the instruments to the court, and testified that the defendant had achieved average scores on the instruments. The court, in coming to its decision, considered the *Miranda* scores as part of the *totality of circumstances* standard for the admissibility of the confession.

In *State v. Caldwell* (1992), the defendant moved to suppress her statements to the police because she could not comprehend the rights. The defense expert’s testimony included the defendant’s scores on the *Miranda* instruments. The expert concluded that the defendant could not comprehend the *Miranda* rights and, therefore, could not have knowingly waived them. The State provided expert testimony to the contrary; however, the trial court accepted the defense expert’s testimony. The court granted the defendant’s motion to suppress her statements, and the state appealed the decision. In reviewing the decision, the court of criminal appeals affirmed the trial court’s holding, noting that “whether a defendant can comprehend her rights is an important factor to be considered
in determining whether her waiver of these rights is voluntary” (p. 1151). The appellate court held the expert testimony, based in part on testing with the *Miranda* instruments, to be sufficient evidence for the trial court’s holding.

However, other courts have not accepted testimony based on *Miranda* testing, especially when such testimony and/or the instruments have been challenged by the prosecution (e.g., *State v. Griffin* (2005); *People v. Rogers* (1998); *Carter v. State* (1997)). In *People v. Rogers* (1998), the trial court held a *Frye* hearing concerning the admissibility of expert testimony for the defense. The court held the *Miranda* instruments not to be reliable and precluded the expert testimony. The defendant appealed the decision, but the appellate court affirmed the holding because the defense failed to demonstrate that the testimony was based on scientific procedures that had gained general acceptance in the field.

In *Carter v. State* (1997), the prosecution also challenged the admissibility of expert testimony based, in part, on *Miranda* testing. At a pretrial hearing, the defense’s expert stated that the instruments were not commonly used or nationally recognized, and that the defense’s use of them to challenge the defendant’s comprehension was unusual. As in *People v. Rogers* (1998), the court precluded expert testimony based on the *Miranda* instruments. The appellate court upheld the decision, stating that the instruments and testimony did not meet the *Frye* standard. Contradicting the rulings, research has since revealed that the majority of forensic experts consider the *Miranda* instruments acceptable for *Miranda* rights waiver evaluations (Lally, 2003). Thus, the instruments do appear to meet the *Frye* standard of general acceptance.

Although rare, the *Miranda* instruments have also been rejected under the
Daubert standard. In State v. Griffin (2005), the trial court excluded testimony based upon the Miranda instruments, and the defendant appealed the decision. The Supreme Court of Connecticut reviewed the expert testimony issue and affirmed the decision, agreeing that the instruments were not scientifically valid nor generally accepted in the relevant scientific community. However, in this case, the Court relied upon incomplete testimony by the presenting expert about the methodological creation of the instruments, scientific use of the instruments, and acceptance of the instruments.

Considering the cases in which Miranda comprehension testimony has been rejected, it is important to note that such rejections may have been erroneous because they were based upon incomplete testimony about the instruments. For example, the expert in State v. Griffin (2005) had only used the instruments once before and was not very familiar with them. The incorrect testimony on the scientific basis and acceptance of the instruments misled the Court and resulted in the rejection of the instruments. Similarly, in Carter v. State (1997), the expert testified that the instruments were not commonly used or nationally recognized. However, the instruments and Grisso’s research have been reviewed and published in many sources, including book series, law reviews, forensic psychology texts, and peer-reviewed journals (Frumkin & Garcia, 2003). Moreover, the results and procedures have been taught in a number of psychology and law training programs (Frumkin & Garcia, 2003) and are accepted by the majority of forensic experts (Lally, 2003). Preclusion of Miranda comprehension testimony based on the ‘unscientific’ basis of the instruments was also erroneous. The instruments were developed under controlled methodology and tested with the common statistical analyses of the time (Frumkin & Garcia, 2003).
In fact, the *Miranda* instruments and expert testimony based upon the instruments meet the *Frye* and *Daubert* standards for admissibility (Frumkin & Garcia, 2003; Grisso, 1998). However, the line of cases rejecting *Miranda* comprehension testimony highlights the need for experts to understand and testify fully about the use, reliability, and validity of the instruments. *Commonwealth v. Woods* (2004) demonstrates the admissibility of the instruments when they are clearly and correctly explained to the court. Nevertheless, updated and additional analyses of the *Miranda* instruments’ validity and reliability will aid in the acceptance and use of the instruments in future cases.

### 1.4 Psychologists’ Perceptions of the Instruments

Acceptance of the *Miranda* instruments within the forensic psychology community is evidenced, not only by the frequency of their use, but also by positive perceptions of the instruments. Lally (2003) surveyed a sample of diplomates in forensic psychology about their acceptance of various measures for forensic assessment. The participants were psychologists who had extensive experience in forensic psychology and were awarded the diplomate by the American Board of Forensic Psychology. Lally examined instruments in six areas of forensic practice, including capacity to waive *Miranda* rights. Sixteen instruments related to the waiver of *Miranda* rights were reviewed. The *Miranda* instruments were rated as acceptable by the majority of diplomates (88%), second only to the *Wechsler Adult Intelligence Scale-III* (WAIS-III) (100%). Further, across the identified areas of forensic practice, the *Miranda* instruments and the *WAIS-III* were the only instruments to be classified as ‘recommended’ by the majority of respondents (55% and 83%, respectively).

Although the *Miranda* instruments have gained wide acceptance, they have not
been without criticism. Rogers and colleagues (2004) reviewed the instruments and asserted many criticisms concerning the reliability and validity of the instruments. These criticisms, however, should be interpreted within the context of Rogers’ assessesment of the instruments as competency-to-confess measures, not capacity-to-confess measures. In viewing the instruments as competency-to-confess measures, Rogers expected the instruments to assess the “totality of circumstances” involved in a suspect’s waiver of rights. As Grisso (2004) underscored in his response to Rogers’ criticisms, however, Rogers’ perspective is illogical, as the instruments were intended only to assess an individual’s basic understanding of *Miranda* rights and appreciation of waiving those rights. Rogers also criticized the use of the instruments in environments (e.g., forensic evaluations) that incite less stress than actual interrogation circumstances. Again, Grisso (2004) pointed out that this critique was unfounded, as the instruments were intended to elicit an individual’s best understanding and appreciation; by assessing an individual’s best understanding and appreciation, an examiner can determine the maximum abilities of the individual with the expectation that these abilities may have been inhibited by stressful circumstances.

Despite the unfounded, general criticisms of the instruments, Rogers (2004) provided specific, valid points of critique. The statistical analyses of the instruments need to be updated and expanded. Contemporary norms must be provided to ensure the continued relevance of the instruments and to support future admissibility in court. Further, statistical data, such as standard deviations and standard error, which have become required indicators of reliability in the last decade, should be included in future analyses. Rogers also noted the lack of data on adult offenders, despite the instruments’
use with both adolescents and adults. In addition, Rogers highlighted the narrow purview of the instruments, as they utilize the specific wording of Miranda rights given in St. Louis County, Missouri in the 1970s (i.e., the location and time of initial data collection) and do not include the now common fifth warning. Finally, Rogers correctly asserted that the assumed, two, hypothetical domains of Miranda abilities, understanding and appreciation, should be statistically supported through confirmatory factor analysis.

Goldstein, Zelle, and Grisso’s (in preparation) development of revised versions of the instruments address Rogers’ valid criticisms. However, construct validity of the two hypothetical domains has yet to be assessed. This study uses both exploratory and confirmatory factor analysis of data collected with the revised instruments to investigate whether the instruments truly measure the domains of understanding and appreciation.

1.5 Revised Instruments

The Miranda Rights Comprehension Instruments-II (MRCI-II) (Goldstein, Zelle, & Grisso, in preparation) are updated versions of the Instruments for Assessing Understanding and Appreciation of Miranda Rights. The language of the warnings in the MRCI-II is simpler, more typical of warnings used by jurisdictions in the U.S. today, and reflects the lower reading level of adolescent suspects.

The original instruments assessed understanding of four prongs, reflecting the four warnings typically included in the Miranda rights in the 1970s. A fifth prong has since been added to many jurisdictions’ Miranda warnings that informs suspects of their right to stop questioning at any time to request a lawyer (Goldstein, Condie, Kalbeitzer, Osman, & Geier, 2003). The MRCI-II instruments include the fifth prong where applicable (i.e., CMR-II, CMR-R-II, & CMV-II). A fifth instrument, Perceptions of
Coercion during the Holding and Interrogation Process (P-CHIP), has also been added to the battery. Whereas the original instruments assess individuals’ understanding and appreciation, the P-CHIP assesses individuals’ self-reported likelihood of offering incriminating information or a confession while under the pressure of interrogation.

Finally, ongoing research using the MRCI-II instruments seeks to update the norms established with the original instruments in order to ensure the applicability of the revised instruments in the 21st Century.

The development of the MRCI-II has included steps to strengthen the reliability and validity of the instruments. Data will be collected on adult offenders, as well as adolescents. The norms will be updated to reflect current adolescent and adult understanding of Miranda rights. Future statistical analyses will also include standard error and standard deviation as measures of reliability. As noted above, the wording of the instruments have been simplified so that results are more generalizable across jurisdictions. Moreover, the fifth prong has been added to the relevant instruments and, thereby, updated them to contemporary usage. Finally, the construct validity of the assumed two domains, understanding and appreciation, was analyzed via exploratory factor analysis and confirmatory factor analysis in this study.

1.6 Importance of Supporting the Two-factor Structure

The Instruments for Assessing Understanding and Appreciation of Rights and the MRCI-II were created with the goal of assessing individuals’ basic understanding of the Miranda rights and appreciation of waiving those rights (Grisso, 1981). In creating such measures, Grisso sought to provide objective methods for assessing the knowing and intelligent requirements of Miranda waivers. The CMR-II, CMR-R-II, and CMV-II are
hypothesized to be discrete scales measuring understanding of *Miranda* rights. The three subscales of the FRI (i.e., *Nature of Interrogation, Right to Counsel, and Right to Silence*) are hypothesized to be discrete scales that assess appreciation of rights. This hypothesized two-factor structure has been partially supported by product-moment correlations (Grisso, 1981). However, prior to this study, a direct statistical examination of the hypothetical, two-factor structure had never been conducted. Statistical analyses supporting the two-factor structure of the instruments would support the construct validity of the *MRCI-II* as a measure of the two *Miranda* requirements.

There are numerous implications of supporting the two-factor model. To begin, the instruments would more clearly parallel the legal criteria of a valid rights waiver. The Court, in *Miranda v. Arizona* (1966), noted that it always sets high standards of proof for the waiver of constitutional rights and would expect the same knowing, intelligent, and voluntary criteria to apply to *Miranda* rights waivers. The establishment of the assumed two-factor model would demonstrate that the instruments parallel the legal criteria of rights waivers and support the instruments as valid measures of those distinct criteria. Further, examiners would be able to more precisely assess, in what domain, examinees lack comprehension. This may allow them to better inform courts about deficits that inhibited a suspect’s capacity to validly waive his/her rights. Finally, a statistically supported model would better meet the elements of the *Daubert* standard and, therefore, provide legally sounder information.
1.7 Hypotheses

1.7.1 Primary Hypothesis

The scales of the *Miranda Rights Comprehension Instruments-II* should form a two-factor model when analyzed via factor analysis. Specifically, the *CMR-II*, *CMR-R-II*, and *CMV-II* should constitute the understanding (or knowing) prong, and the *FRI* should constitute the appreciation (or intelligent) prong.

1.7.2 Secondary Hypothesis

Should the *CMR-II* and *CMR-R-II* factor load together, it was expected that the individual prongs of the instruments would be significantly related. For example, *CMR-II* item 1 should be significantly related to *CMR-R-II* subscore A, as they are both concerned with the right to silence.

**CHAPTER 2: METHODS**

This study was part of a larger research project conducted in Pennsylvania and Massachusetts. This study analyzed data collected from both locations.

2.1 Participants

Participants were 140 adolescent boys and 43 adolescent girls in pre- and post-adjudication facilities in the greater Philadelphia, Pennsylvania region and in Worcester, Massachusetts. Data collection in Massachusetts was conducted from October 1999 through July 2000. Data collection in Pennsylvania was conducted from August 2004 through November 2006. Participants ranged in age from 11 through 19 years (*M* = 16.45, *SD* = 1.72). The sample was racially diverse, consisting of 46.4% African American, 15.8% Caucasian, 15.8% Hispanic, and 1.6% Asian American participants. 11.5% of participants identified as being of another race (including bi-racial) and 8.7% of
participants did not report race. Although the researchers were not permitted to review youths’ records to determine offenses, youths self-reported offenses ranging from truancy to attempted murder.

In order to participate, adolescents in Pennsylvania must have been housed in a Philadelphia Department of Human Services (DHS) facility and represented by the Philadelphia Defender Association. The Defender Association gave names of potential participants to the study coordinator. Adolescents aged 18 and 19 must have consented to participate in the study. For those under age 18, parental/guardian consent was sought. If parental/guardian consent was obtained, youth assent was sought. When parents/guardians were unable to be reached by phone after five attempts, parental/guardian consent was waived, and adolescents were then informed of the study and assented in the presence of a “participant advocate.” A participant advocate was an interested facility staff member who was present to ensure that youth agreed to participate voluntarily and seemed to understand the assent process.

Individuals were excluded from participating if they or their parents/guardians refused to participate, did not speak English fluently, exhibited severe developmental disabilities, or if they were experiencing florid psychotic symptoms at the time of assent/consent or assessment. Further, adolescents were excluded if they had open cases involving confessions or Miranda waivers. No youth met exclusion criteria.

Of the names received from the Defender Association, approximately 45% of guardians were reached. Of guardians reached, approximately 57% verbally agreed and 8% declined participation. The remaining 36% of guardians reported that the youth had been discharged from the facility. Of the guardians who verbally agreed, approximately
22% returned the consent forms mailed to them. When a consent form was received, assent was sought from the youth. If a consent form was not returned, research staff did not approach the youth for participation.

Data were also collected from 57 adolescent boys in Massachusetts. Participants in Massachusetts were housed in a residential post-adjudication facility. The Massachusetts Department of Youth Services provided consent for the youths because the state had custody of delinquent youths placed in residential facilities. Youths’ parents were contacted by mail and invited to deny participation. No parents declined. Youths were also informed of the study and assented before participating. Before a youth was approached, an advocate from the facility cleared the youth for participation, based on the stability of his mental health and behavior at the time; all youth were cleared by the facility. Assent was obtained for youths under 18, and consent was obtained from 18- and 19-year-old youths. No youths declined participation.

2.2 Measures

2.2.1 Miranda Rights Comprehension Instruments – II

(a) Comprehension of Miranda Rights – II (CMR-II). The CMR-II includes the fifth prong of the Miranda warnings, as well as simplified wording of the warnings. The testing procedures and scoring structure remain the same as for the CMR. The CMR-II assesses an examinee’s understanding of the basic meaning of each of the five Miranda warnings. Examinees are asked to explain the meaning of each warning, and their answers are scored using standardized scoring criteria.

The scoring criteria for the original instruments were developed by a national panel of lawyers and psychologists (Grisso, 1998). For the MRCI-II, some basic changes
were made to the original four prongs, such as the addition of sample responses (e.g., “You will see a probation officer” as an inadequate response for CMR-II prong three) (Goldstein et al., 2003). Overall, the scoring criteria created by the panel of lawyers and psychologists was maintained. For the fifth prong, the instrument authors generated scoring criteria in the same format, and an expert panel of lawyers and psychologists reviewed the criteria. The panel also reviewed the original criteria and changes to the original criteria (Goldstein et al., 2003). Currently, a study is being conducted to independently validate the scoring criteria. A survey is being distributed that asks lawyers and judges to rate the criteria, and agreement will be calculated between legal participants’ rating and the scoring criteria.

Responses are considered adequate, questionable, or inadequate, and scored 2, 1, or 0, respectively. CMR-II total scores can range from 0 (i.e., five inadequate answers) to 10 (i.e., five adequate answers).

(b) Comprehension of Miranda Rights – Recognition – II (CMR-R-II). The CMR-R-II maintains the same testing procedure and scoring structure as the original CMR-R but, now, also includes three pre-constructed sentences for comparison with the fifth prong, as well as simplified wording of the warnings. The CMR-R-II assesses an examinee’s understanding of each of the five Miranda warnings. Instead of relying on an individual’s verbal expressive skills, however, the CMR-R-II assesses Miranda understanding through recognition. The CMR-R-II presents three pre-constructed sentences for each Miranda warning. Examinees must recognize whether each sentence is identical in meaning to the Miranda warning. Scoring for the CMR-R-II is bivariate, with correct responses receiving one point and incorrect responses receiving zero points.
Total scores can range from 0 (i.e., incorrect recognition of each of the 15 pre-constructed sentences) to 15 (i.e., correct recognition of each of the 15 pre-constructed sentences).

(c) *Function of Rights in Interrogation (FRI)*. The *FRI* instrument has not been altered from its original version. The *FRI* instrument assesses an examinee’s appreciation of the significance of *Miranda* rights in interrogation and legal proceedings. Examinees are presented with four scenarios and accompanying drawn pictures related to legal proceedings. Examinees’ appreciation of the significance of rights is assessed via fifteen standardized questions. The questions assess whether examinees recognize the nature of interrogation (NI subscale), grasp the significance of the right to counsel (RC subscale), and grasp the significance of the right to silence (RS subscale). The scoring structure for the *FRI* is identical to that of the *CMR-II*. Total scores can range from 0 (i.e., inadequate responses to all 15 questions) to 30 (i.e., adequate responses to all 15 questions).

Two items from the NI subscale were not administered to Massachusetts participants because questions that attempted to tap emotions may have been captured by information on the *P-CHIP*. However, for scale compliance, the two items were reinstituted with the Philadelphia sample. Scores for Massachusetts participants were proportionally adjusted so that they were out of 30 points, to match the score range of Philadelphia participants and to allow for aggregated analyses.
(d) Comprehension of Miranda Vocabulary – II (CMV-II). The CMV-II contains 10 new legal vocabulary words, in addition to the six words originally included in the CMV. The CMV-II assesses examinees’ understanding of legal vocabulary often used in Miranda warnings. Examinees are asked to define 16 words that are read to them and used in sentences. Scoring for the CMV-II is identical to that of the CMR-II and FRI. Total scores can range from 0 (i.e., inadequate responses to all 16 words) to 32 (i.e., adequate responses to all 16 words).

(e) Perceptions of Coercion during the Holding and Interrogation Process (P-CHIP). The P-CHIP has been added to the MRCI-II battery. The P-CHIP assesses an individual’s self-reported likelihood of providing incriminating information or a confession in hypothetical situations. Examinees are read a story about an individual of the same age and gender brought in for questioning by the police. Twenty-six situations based on the story are then presented to the examinee. The situations depict different types of pressure a suspect might encounter: positive police pressure, negative police pressure, and parental pressure. Examinees are then asked three questions about whether the character should talk to the police if guilty of the offense, how stressed the character feels, and how likely the character is to confess if innocent of the offense. Whereas the previous instruments seek to assess examinees’ capacities in the two domains of understanding and appreciation, the P-CHIP seeks to assess waiver behavior and will not be analyzed in the current study; unlike the other four instruments, the P-CHIP does not

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1 This paragraph describes the final version of the CMV-II. The initial revision of the CMV resulted in an 18-item CMV-II, which was described in Goldstein et al. (2003). Since publication of that article, the instrument has undergone further refinement. Based on item analysis, two items (i.e., silent and talk to) were removed from the CMV-II. The 18-item version of the CMV-II was administered to participants. Factor analyses were conducted with total scores from the 16 items that comprise the final version of the CMV-II.
directly assess legal criteria associated with a *Miranda* waiver.

Initial psychometrics indicated that each of the component instruments obtained acceptable levels of validity and reliability (Kalbeitzer, Goldstein, Riggs Romaine, Mesiarik, & Zelle, 2008).

**2.2.2 Demographic Questionnaire**

On a demographic questionnaire, participants were asked to provide information about themselves, such as age, history of arrest and detention, whether they discussed the *Miranda* warnings with their lawyers, where they learned about the warnings, and recollection of *Miranda* warnings.

**2.2.3 Measures Administered but Not Used in the Current Study**

Participants were also administered additional instruments as part of the larger study. Participants completed the *Massachusetts Youth Screening Instrument – 2* (MAYSI-2), a self-report screen of mental health problems (Grisso & Barnum, 2000); the verbal subsections of the *Wechsler Abbreviated Scale of Intelligence* (WASI), a standardized measure of intellectual functioning (The Psychological Corporation, 1999); the verbal portions of the *Wechsler Individual Achievement Test* (WIAT), a standardized measure of academic achievement (The Psychological Corporation, 1992); and the *Gudjonsson Suggestibility Scale – 2* (GSS-2), a measure of susceptibility to suggestion (Gudjonsson, 1997).

**2.3 Procedures**

Administration required approximately three hours, and measures were administered across two testing sessions. The two sessions typically took place on two separate days, but some youth chose to complete all measures in one day. Participants
were given a $15 gift certificate to a music store for participating in the study.

During session one, participants completed the *MRCI-II*. The demographics questionnaire was administered after the *MRCI-II* to avoid educating participants about *Miranda* rights. The *WASI* subtests were completed as the final part of session one.

During session two, participants were administered the first portion of the *GSS-2*. The *GSS-2* requires that approximately 50 minutes pass between administration of the first and second portions of the test. Therefore, the *WIAT* verbal subtests were administered to participants between the first and second portions of the *GSS-2*.

The *MAYS1-2* was administered by Philadelphia juvenile justice facilities upon admission. Participants’ *MAYS1-2* results were obtained from the state agency that receives this mental health data from the facilities and stores it in a database. The *MAYS1-2* was not administered to Massachusetts participants.

**CHAPTER 3: METHOD OF ANALYSIS**

**3.1 Preparatory Analyses**

Descriptive statistics were run to examine sample characteristics. Correlations between measures were also examined as correlated measures are expected to factor-load together. The measures had sufficiently strong correlations (> .30), indicating the appropriateness of pursuing factor analysis (Floyd & Widaman, 1995). Visual inspection of the data revealed no violations of the assumption of normality.

**3.2 Analyses of Primary Hypothesis**

Exploratory factor analysis (EFA) was conducted with the SPSS 16.0 software program (SPSS, 2007) using principal component analysis with *CMR-II*, *CMR-R-II*, *CMV-II* and *FRI* total scores. Although there was theoretical support and some statistical
support for a two-factor model, the lack of strong empirical support for the model warranted beginning with exploratory, rather than confirmatory factor analyses. One-factor, two-factor, and three-factor models were examined. Eigenvalues and the scree plot were examined as criteria for factor retention. Varimax orthogonal rotation was applied. Meaningful factor loadings were defined as those that exceeded .40 (Floyd & Widaman, 1995).

Factor analysis was conducted using instrument totals for three reasons. First, factor analysis at the item level was not appropriate because there were too few participants to fulfill the suggested 5 to 10 participants per variable (Floyd & Widaman, 1995). The four instruments have a total of 61 items, requiring 300 to 600 participants to conduct a valid item-level factor analysis. Second, the instruments were designed to tap understanding and appreciation in different ways, and their individual items are distinct in content and structure. Moreover, the scoring criteria differ between the instruments (i.e., the 0/1 scoring on CMR-R-II items versus the 0-2 scoring on the other three instruments) and are limited in range, making individual item analysis inappropriate. Using the instrument totals provides continuous data on four variables. Finally, and most importantly, the theory underlying the instruments’ development was that each would provide a distinct measure of understanding or appreciation, and the aim of this factor analysis was not data reduction; the focus of the analyses was on examining the underlying structure of the four instruments, not their individual items.

Initial goodness-of-fit of the model was evaluated by examining the percent of variance explained by the factor models. Although 60% of variance explained is often used as an a priori stopping point for extracting factors, it is actually a minimum cutoff
In the current study, a higher cut off threshold of 80% of the variance explained was set, as suggested by Floyd and Widaman (1995). Percent of variance explained served as the primary determinant for factor retention and initial measure of model fit; less reliance was placed on eigenvalues (Kaiser test) and scree plots. The use of three stopping rules for extracting factors was adopted in order to provide multiple indicators of the appropriate factors for the model. Moreover, greater emphasis was placed on the percent of variance explained than on eigenvalues or scree plots because the percent of variance explained provides a clearer description of the value of each factor to the model’s fit. In addition, percent of variance explained was prioritized based on concerns that, with only four indicators in the model, eigenvalues and scree plots would impose overly stringent cutoffs.

Cross-validation of the model solution was not pursued due to the small sample size. Although it was possible to split the sample into two groups (derivation sample and cross-validation sample) and maintain the 5 to 10 participants per variable ratio suggested (Floyd & Widaman, 1995), it was deemed inappropriate to identify the model with a 90-participant sample. Moreover, confirmatory factor analyses were planned to validate the model derived from exploratory analyses, thus, limiting the necessity of cross-validation in the current sample. Future analyses with data collected from other populations (e.g., non-delinquent youths, adult offenders) should provide cross-validation of the model.

The one-, two-, and three-factor models derived in EFA were then tested for model fit using confirmatory factor analysis (CFA). Item loadings greater than or equal to .40 were retained. CFA was conducted with the AMOS 16.0 software program (SPSS, 2007) using maximum likelihood (ML) estimates. All three factor models were
submitted to CFA to test the fit of the models for comparison purposes.

Goodness-of-fit was evaluated using $\chi^2$, root mean square error of approximation (RMSEA) and its 90% confidence interval (90% CI) and test of close fit (CFit), comparative fit index (CFI), and the Tucker-Lewis index (TLI). Acceptable model fit was defined by the following criteria: $\chi^2 (ns)$, RMSEA ($\leq .06$, 90% CI $\leq .06$, CFit $ns$), CFI ($\geq .95$), and TLI ($\geq .95$) (Hu & Bentler, 1999). Multiple indices were used, as suggested by Hu and Bentler (1999), because they provide different information about model fit (i.e., absolute fit, fit adjusting for model parsimony, fit relative to a null model) and provide a more reliable evaluation of model fit.

3.3 Analyses of Secondary Hypothesis

Analyses of the secondary hypothesis were conducted using Spearman rank-order correlation coefficients with the five CMR-II items and five CMR-R-II subscores. The five items of the CMR-II and subscores of the CMR-R-II correspond to the five Miranda warnings typically given by jurisdictions. Spearman rank-order correlation coefficients were used because the scoring criteria for the two instruments’ items were too restricted in range to conduct factor analyses and are essentially ordinal (i.e., 0, 1, 2 for CMR-II items and 0, 1, 2, 3 for CMR-R-II subscores).

CHAPTER 4: RESULTS

Correlations between measures indicated that the measures were significantly correlated and met the greater than .30 criteria to proceed with factor analysis. Table 1 presents the correlations between measures.
4.1 Factor Analysis

The *CMR-II, CMR-R-II, CMV-II* and *FRI* total scores were submitted to exploratory factor analysis with principal component analysis and varimax rotation in SPSS 16.0 (SPSS Inc., 2007). One-factor, two-factor, and three-factor models were extracted and results are summarized in Table 2. The one-factor model explained 63% of the variance; however, the two-factor model provided a better fit as it approached the 80% variance explained cut off.

All of the measures loaded onto at least one factor in the two-factor model (i.e., they had factor loadings greater than or equal to .40). The *CMR-II* and *CMR-R-II* loaded substantially on Factor 1 (.81 and .86, respectively), and the *FRI* loaded substantially on Factor 2 (.95), as expected. On the other hand, the *CMV-II* loaded substantially on Factor 1 (.69) and Factor 2 (.46). Varimax rotation was used to help achieve a simple factor structure for interpretability, and it was beneficial for the two- and three-factor models. Instrument loadings for the one-factor model, and pre- and post-rotation instrument loadings for the two- and three-factor models, are summarized in Table 3.

The two-factor model fit was supported in CFA, as it met each of the fit index criteria, $\chi^2(2) = .18, p = .67$, RMSEA = 0.00 (90% CI = 0.00 - .15; CFit = .73), CFI = 1.00, TLI = 1.04. The one-factor model also met the fit index criteria, $\chi^2(2) = 1.71, p = .43$, RMSEA = 0.00 (90% CI = 0.00 - .14; CFit = .57), CFI = 1.00, TLI = 1.01. On the other hand, the three-factor model indicated a poor fit, $\chi^2(2) = 661.68, p < .01$, RMSEA = 1.35 (90% CI = 1.26 – 1.43; CFit < .01), CFI < .01, TLI = -14.47. Fit statistics are summarized in Table 4.

Fit statistics for the one-factor and two-factor models were very similar. The two-
factor model was considered preferable because it was easily interpretable, neared the percent of variance explained cutoff in EFA, and was most consistent with the theoretically-based design of the instruments. The final two-factor model is depicted in Figure 1.

4.2 Spearman Rank-order Correlation Coefficients

The Spearman rank-order analysis indicated that, as expected, all of the individual corresponding prongs on the CMR-II and CMR-R-II were significantly related (e.g., score on right to silence on the CMR-II correlated significantly with score on right to silence on the CMR-R-II). Correlations between corresponding prongs are summarized in Table 5. Notably, different prongs did not always correlate significantly between the two measures (e.g., score on right to a lawyer on the CMR-II did not correlate significantly with score on right to free lawyer for indigent suspects on the CMR-R-II), providing discriminant validity for the individual prongs. Correlations between all CMR-II instrument items and CMR-R-II subscores are summarized in Table 6.

CHAPTER 5: DISCUSSION

The current study expanded the psychometric basis of the Miranda Rights Comprehension Instruments – II by evaluating its factor structure in a multistate sample of delinquent youth. Results support the theoretical two-factor structure of the Miranda instruments. The four measures compose a two-factor model, indicating it is appropriate to think of them as measuring more than one construct but less than three discrete abilities. The original Instruments for Assessing Understanding and Appreciation of Rights were developed on the theory that the component measures would tap the distinct constructs of understanding (i.e., knowing) and appreciation (i.e., intelligent) required for
a valid *Miranda* rights waiver. The *MRCI-II* instruments maintain the same theoretical structure, and this was the first study to empirically examine the proposed structure beyond use of inter-measure correlations.

5.1 Factor Structure of the *Miranda Rights Comprehension Instruments-II*

The results supported the two-factor theory of the instruments but also revealed some unexpected findings. The *MRCI-II* instruments demonstrated greater intercorrelation than Grisso (1999) found with the original instruments. The *CMR-II* and *CMR-R-II* loaded separately from the *FRI*, as expected, and in support of the two-factor theory. However, the *CMV-II* loaded substantially on both Factor 1 (understanding) and Factor 2 (appreciation). This result raises questions about the role that vocabulary plays in the understanding and appreciation of *Miranda* rights.

Historically, vocabulary has been grouped with the *CMR* and *CMR-R* as a measure of understanding. More recently, we have proposed a different perspective on vocabulary’s role in *Miranda* comprehension (Zelle, Goldstein, Riggs Romaine, Serico, Kemp, & Taormina, 2008). It may be more accurate to consider vocabulary to be a prerequisite to both understanding and appreciation. In other words, a basic knowledge of the specific language used in *Miranda* warnings may precede both the understanding and appreciation of the warnings. Without understanding the meaning of a specific word, an individual is less likely to understand the warning in which the word appears and, therefore, to appreciate the significance of the warning. Considering the relationship that vocabulary knowledge may have to both understanding and appreciation of the warnings, it is plausible, therefore, that the *CMV-II* would be related to both factor constructs.

Overall, the results of the current study lend to the construct validity of the *MRCI-
II as a measure of two discrete constructs. A one-factor model provided a sufficient fit based on a minimal standard of percent of variance explained in EFA, and the model was supported by CFA. This result was not unexpected, however, when one considers that an overarching concept of Miranda comprehension should exist. Understanding and appreciation of Miranda rights are considered to be two parts of a broader, higher-order construct of Miranda comprehension. Therefore, the fact that all four instruments loaded substantially on at least one of the two factors of understanding and appreciation would indicate that all four instruments are related to the broader construct of Miranda comprehension. The good fit of the one-factor model confirms the importance of the four instruments in measuring Miranda comprehension. However, a one-factor model fails to recognize the specificity in types of Miranda comprehension; it does not provide a fine-tuned instrument structure.

On the other hand, the two factor-model provides a good fit and reflects the theoretical structure of the instruments. The two-factor model approached the cutoff of percent of variance explained in EFA and demonstrated fit comparable to the one-factor model in CFA. The superior interpretability of the two-factor model, as well as its conformity with the theoretical structure of the instruments, provide evidence in favor of the construct validity of the MRCI-II measures. It appears the measures parallel the legal criteria of knowing and intelligent, as intended, and it is appropriate, therefore, to think of the instruments as objective methods for assessing the knowing and intelligent requirements of Miranda waivers. In addition, the statistical support for the model helps the instruments meet the elements of the Daubert standard, as did the original instruments.
In contrast to the one-factor and two-factor models, the three-factor model provided a very poor fit. Examination of the factor loadings suggests that a three-factor model may reflect the instruments’ format, rather than the instruments’ content. After rotation, the *CMR-II* and *FRI*, which use free-response formats, loaded on Factor 1, the *CMR-R-II*, which uses a forced-choice format, loaded on Factor 2, and the *CMV-II*, which uses a standard word-definition format, loaded on Factor 3. Therefore, it would seem that when a three-factor model was extracted, the instruments loaded based on their format, not on their relation to underlying constructs. Thus, the three-factor model provided a very poor fit.

Results of the current study also have implications for how the instruments are used in evaluations. Recent research examining practitioners’ use of the original instruments revealed that, although the majority of practitioners used all four instruments all of the time, some practitioners reported using only a subset of the instruments (Ryba, Brodsky, & Shlosberg, 2007). For example, some practitioners reported using the *CMR*, *CMR-R*, and *CMV* but not the *FRI*, whereas other practitioners used the *CMR-R* and *FRI* less frequently than the *CMR* and *CMV*, and other practitioners reported using the *FRI* more frequently than the *CMR*, *CMR-R*, and *CMV* (Ryba, Brodsky, & Shlosberg, 2007). Such practices do not breach the proposed administration of the instruments, as each of the instruments was designed to be a stand-alone test, and use of the battery does not require that all four measures be given (Grisso, 1981). However, the results of the current study support using more than one component measure, and at least one understanding measure in combination with the *FRI*. Moreover, the probable role of vocabulary as a prerequisite for both understanding and appreciation suggests that the
CMV-II should be administered, and results on the CMR-II, CMR-R-II, and FRI should be interpreted within the context of CMV-II performance.

5.2 Relationship between Prongs on CMR-II and CMR-R-II

Further, the results of the analyses examining the relationship between individual CMR-II items and CMR-R-II subscores indicated that understanding of individual prongs appears to be consistent across the instruments. In other words, individuals who do poorly defining a warning on the CMR-II also struggle with the same warning on the CMR-R-II, despite the different formatting. The CMR-II and CMR-R-II loaded together on one factor, indicating that they tapped the same underlying construct; however, because instrument total scores were used for factor analyses, it was unclear whether level of understanding of the individual prongs was consistent across instruments. The results of the rank-order correlations revealed that the individual prongs correlated significantly between the two instruments (e.g., understanding of right to silence on the CMR-II correlated significantly with understanding of right to silence on the CMR-R-II). Therefore, the results of this study also support the idea that the two instruments measure understanding of each of the five Miranda warnings.

5.3 Limitations

The somewhat small sample size limited cross-validation of the model within the current sample. Future analyses with additional samples will provide opportunities to further validate the two-factor model. The two-factor model also fell short of meeting the 80% of variance explained cutoff suggested by Floyd and Widaman (1995). However, the model explained 79% of the variance, which is a marked improvement over the 63% explained by a one-factor model and strong support for the importance of a second factor
in the model. CFA also confirmed the fit of a two-factor model as comparable to the one-factor model. Future analyses may be pursued to confirm the two-factor model with other samples.


Tables

Table 1. Inter-instrument correlations

<table>
<thead>
<tr>
<th></th>
<th>CMR-R-II</th>
<th>CMV-II</th>
<th>FRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMR-II</td>
<td>.57**</td>
<td>.62**</td>
<td>.45**</td>
</tr>
<tr>
<td>CMR-R-II</td>
<td>.50**</td>
<td></td>
<td>.39**</td>
</tr>
<tr>
<td>CMV-II</td>
<td></td>
<td>.48**</td>
<td></td>
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** p < .01

Table 2. Principal component factor extractions

<table>
<thead>
<tr>
<th>Component</th>
<th>Eigenvalues</th>
<th>% of Variance Explained</th>
<th>Cumulative %</th>
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<tbody>
<tr>
<td>1</td>
<td>2.51</td>
<td>62.69</td>
<td>62.69</td>
</tr>
<tr>
<td>2</td>
<td>.64</td>
<td>15.89</td>
<td>78.59</td>
</tr>
<tr>
<td>3</td>
<td>.50</td>
<td>12.41</td>
<td>90.99</td>
</tr>
<tr>
<td>4</td>
<td>.36</td>
<td>9.01</td>
<td>100.00</td>
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</table>

Tables 3a-c. Instrument loadings on one-, two-, and three-factor models

a. One-factor Model

<table>
<thead>
<tr>
<th></th>
<th>Factor 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMR-II</td>
<td>.85</td>
</tr>
<tr>
<td>CMR-R-II</td>
<td>.77</td>
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<tr>
<td>CMV-II</td>
<td>.83</td>
</tr>
<tr>
<td>FRI</td>
<td>.71</td>
</tr>
</tbody>
</table>

b. Two-factor Model

<table>
<thead>
<tr>
<th></th>
<th>Pre-rotation</th>
<th>Post-rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Factor 1</td>
<td>Factor 2</td>
</tr>
<tr>
<td>CMR-II</td>
<td>.85</td>
<td>-.19</td>
</tr>
<tr>
<td>CMR-R-II</td>
<td>.77</td>
<td>-.40</td>
</tr>
<tr>
<td>CMV-II</td>
<td>.83</td>
<td>-.01</td>
</tr>
<tr>
<td>FRI</td>
<td>.71</td>
<td>.66</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Post-rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1</td>
<td>Factor 2</td>
</tr>
<tr>
<td>CMR-II</td>
<td>.81</td>
</tr>
<tr>
<td>CMR-R-II</td>
<td>.86</td>
</tr>
<tr>
<td>CMV-II</td>
<td>.69</td>
</tr>
<tr>
<td>FRI</td>
<td>.22</td>
</tr>
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</table>
c. Three-factor Model

<table>
<thead>
<tr>
<th>CMR-II</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>.85</td>
<td>-.19</td>
<td>-.19</td>
<td></td>
</tr>
<tr>
<td>CMR-R-II</td>
<td>.77</td>
<td>-.40</td>
<td>.47</td>
</tr>
<tr>
<td>CMV-II</td>
<td>.83</td>
<td>-.01</td>
<td>-.44</td>
</tr>
<tr>
<td>FRI</td>
<td>.71</td>
<td>.66</td>
<td>.22</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CMR-II</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>.75</td>
<td>.43</td>
<td>.18</td>
<td></td>
</tr>
<tr>
<td>CMR-R-II</td>
<td>.28</td>
<td>.93</td>
<td>.17</td>
</tr>
<tr>
<td>CMV-II</td>
<td>.25</td>
<td>.17</td>
<td>.95</td>
</tr>
<tr>
<td>FRI</td>
<td>.89</td>
<td>.16</td>
<td>.25</td>
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</table>

Table 4. Summary of model fit statistics from the confirmatory factor analysis

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>RMSEA (90% CI)</th>
<th>CFI</th>
<th>TLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>One factor</td>
<td>1.71</td>
<td>2</td>
<td>.00 (.00-.14)</td>
<td>1.00</td>
<td>1.01</td>
</tr>
<tr>
<td>Two factor</td>
<td>.18</td>
<td>2</td>
<td>.00 (.00-.15)</td>
<td>1.00</td>
<td>1.04</td>
</tr>
<tr>
<td>Three factor</td>
<td>661.68**</td>
<td>2</td>
<td>1.35 (1.26-1.43)</td>
<td>&lt; .01</td>
<td>-14.47</td>
</tr>
</tbody>
</table>

** $p < .01$

Table 5. Summary of Spearman rank-order correlation coefficients between corresponding CMR-II item and CMR-R-II subscore

<table>
<thead>
<tr>
<th></th>
<th>$r_s$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right to silence</td>
<td>.54</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Use of statements as evidence</td>
<td>.22</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Right to counsel</td>
<td>.15</td>
<td>.04</td>
</tr>
<tr>
<td>Right to free counsel for the indigent</td>
<td>.23</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Right to stop questioning</td>
<td>.25</td>
<td>&lt; .01</td>
</tr>
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</table>
Table 6. Summary of Spearman rank-order correlation coefficients between CMR-II items and CMR-R-II subscores

<table>
<thead>
<tr>
<th>CMR-II/CMR-R-II</th>
<th>Subscore A</th>
<th>Subscore B</th>
<th>Subscore C</th>
<th>Subscore D</th>
<th>Subscore E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 1</td>
<td>.54**</td>
<td>.22**</td>
<td>.26**</td>
<td>.28**</td>
<td>.22**</td>
</tr>
<tr>
<td>Item 2</td>
<td>.15*</td>
<td>.22**</td>
<td>.04</td>
<td>.15*</td>
<td>.14</td>
</tr>
<tr>
<td>Item 3</td>
<td>.26**</td>
<td>.15</td>
<td>.15*</td>
<td>.26**</td>
<td>.28**</td>
</tr>
<tr>
<td>Item 4</td>
<td>.08</td>
<td>.08</td>
<td>.09</td>
<td>.23**</td>
<td>.24**</td>
</tr>
<tr>
<td>Item 5</td>
<td>.29**</td>
<td>.19**</td>
<td>.17*</td>
<td>.21**</td>
<td>.25**</td>
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</tbody>
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Figures

Figure 1. Final two-factor model with standardized estimates