COMPAS Core Norms for Community Corrections

Results from a Psychometric Study
Conducted for the Wisconsin
Department of Corrections
Division of Adult Community Corrections

DRAFT

Research & Development Division

William Dieterich, PhD
William L. Oliver, PhD
Tim Brennan, PhD

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Chapter 1

Executive Summary

This report presents results from a norm study conducted for the Wisconsin Department of Corrections, Division of Adult Community Corrections (WIDOC DCC). The norm study assessed the scale cutting points for the criminal history, needs, and risk scales in the COMPAS Core application in use by the WIDOC. The primary objective of the study was to evaluate the default Core Composite Norm group as a reference for setting decile cutting points for these scales.

For the COMPAS Core application, the WIDOC currently references *gender-neutral* Core Composite Norm data to score the deciles for the Violent Recidivism Risk scale. The COMPAS Core deciles scores for the General Recidivism Risk Scale and the criminal history and needs scales are calculated by referencing *gender-specific* Core Composite Norm data. The Core Composite Norm data is composed of COMPAS Core scale scores from probation, jail, and prison samples. The WIDOC uses the Composite Norm Group for its COMPAS Core applications in both the Division of Adult Community Corrections and Division of Adult Institutions (DAI).

The norm data are used to set deciles cuts, which, in turn, are used to set the low, medium, and high cuts on the criminal history, needs, and risk scales.

The WIDOC uses a triage assessment protocol that hinges on two COMPAS Core scale sets. The *Primary Needs* scale set includes the Criminal Involvement, Violence History, Current Violence, Criminal Associates, History of Noncompliance, Substance Abuse, Vocation Education, Criminal Thinking, Criminal Personality, Violent Recidivism Risk, and General Recidivism Risk scales. The *Primary Needs* scale set is used on all probation intakes. In the DCC sample, there are 25,733 individuals that were assessed with the *Primary Needs* scale set. Persons scoring Medium or High on either the Violent Recidivism Risk Scale or the General Recidivism Risk Scale are assessed with the *Full COMPAS Core* scale set. The *Full COMPAS Core* scale set includes the *Primary Needs* scale set (copied over) plus the Financial Problems, Family Crime, Social Environment, Leisure, Residential Instability, Social Adjustment, Socialization Failure, Criminal Opportunity, Social Isolation, and Pretrial Release Risk scales. There are 17,593 persons assessed with the *Full COMPAS Core* scale set.

The WIDOC DCC study sample consists of COMPAS Core assessments conducted from July 1, 2012 through August 31, 2013. The study sample consists of 25,773 individuals assessed with COMPAS Core at DCC intake. The study sample was composed by selecting the most recent *Full Core Assessment* if it existed. Otherwise the most recent *Primary Needs Assessment*

was selected. The sample was restricted to assessments where the creating agency was DCC, the assessment reason was DCC intake, and the assessment screening date was between July 1, 2012 and August 31, 2013. This study time frame was chosen to obtain a sample that excluded nonrepresentative assessments that were collected during the early stage of COMPAS implementation in the DCC.

Below we present the major findings in the current study — each followed by a brief technical discussion:

Major Findings

Comparisons of the Distributions in the Norm Group and the WIDOC DCC Study Sample

We compared the distributions of the COMPAS Core criminal history, needs, and risk scales in the WIDOC DCC study sample with the distributions of the these scales in the default COMPAS Composite Norm group. The properties that we examined are important because the cutting points for low, medium and high classifications are based on the percentiles in the norm groups. We evaluated distributional properties by comparing the decile cutting points and other quantiles in the WIDOC DCC sample and the Composite Norm Group. We also compared plots and graphs of the distributions. In particular we compared deciles and examined quantile-quantile plots to assess shifts in the WIDOC DCC scale distributions relative to the scale distributions in the Composite Norm Group. An explanation of deciles scores and their interpretation is given on page 18. An example of deciles comparison can be seen in Table 3.4. An explanation of quantile-quantile plots is provided on page 81.

For most of the needs scales, the results indicate good alignment between the scale distributions in the WIDOC study sample and the COMPAS Core Composite Norm. We found that the scores (distributions) of some risk scales and criminal history scales in the WIDOC study sample were shifted substantially lower in comparison to the Composite Norm Group. The most pronounced downward shifts were observed for the *General Recidivism Risk*, *Violent Recidivism Risk*, and *Criminal Involvement* scales. In general we found the distributions of the needs scales in the WIDOC data were more closely aligned with the distributions in the COMPAS Core Composite Norm. The downward shifts in the distributions of the criminal history scales and risk scales are expected given the more serious criminal history profile of the Composite Norm Group.

Evaluating the Proportions of Cases in the Levels of the Core Scales

The norm data are used to set deciles cuts on the criminal history, needs, and risk scales, which, in turn, are used to set the low, medium, and high cuts. If a scale distribution in the WIDOC study sample is similar to the corresponding scale distribution in the Composite Norm, we should observe splits into the levels that are approximately the same as the *theoretical* split for that type. Three basic decile cutting point schemes are used in COMPAS: (1) Cuts located at Decile 5 and Decile 8 resulting in *theoretical* proportions in the low, medium, and high levels of 40%, 30%, and 30%, respectively; (2) Cuts located at Decile 3 and Decile 5 resulting in

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theoretical proportions in the unlikely, probable, and highly probable levels of 20%, 20%, and 60%, respectively; (3) Cuts located at Decile 6 and Decile 8 resulting in *theoretical* proportions in the unlikely, probable, and highly probable levels of 50%, 20%, and 30%, respectively. An explanation of scale types and deciles cutting point schemes is given on page 18.

For example the cuts for the *General Recidivism Risk Scale* are located at the 5th decile (50th percentile) and 8th decile (80th percentile). Thus the expected or *theoretical* proportions in the low, medium, and high levels are 40%, 30%, and 30%, respectively, if the scale distribution in the WIDOC sample data is similar to the scale distribution in the Composite Norm. A norm group that is aligned to the agency data will produce decile scores that have an approximate percentile interpretation.

Some of the scale distributions have positive skew (most persons score low on the scale). Even in the case of well-aligned normative data, decile scores for scales that have skewed distributions will lack percentile interpretations, and the proportions in low, medium, and high will not match the *theoretical* proportions (e.g., 40-30-30) no matter what norm group is referenced. For example 60% of the men in the WIDOC study sample score the lowest possible score on the Current Violence Scale. Thus 60% of the men in the study sample would fall into Decile 1 no matter what norm group is referenced. When evaluating the proportions in the levels of a scale, the scale distribution should be taken into account, because it may determine how well or if the scale can be cut into proportions that match the *theoretical* proportions.

To help understand this property of the norm data, we have developed a special *norm table* for the COMPAS scales. We use the *norm table* to compare the *observed* proportions in each level and the *best* possible proportions in each level with the *theoretical* proportions. The approach gives indices of dissimilarity between the observed proportions and the theoretical proportions (D_{obs}) and between the best proportions and the theoretical proportions (D_{best}). The *observed* proportions are the result of using the default Composite Norm Group as a reference for scoring the deciles in the WIDOC study sample.

Section 3.3 discusses this approach and shows the results of applying it in the study sample. Consistent with the deciles results and time series results, we found substantial downward shifts of the proportions in the levels of the *General Recidivism Risk*, *Violent Recidivism Risk*, and *Criminal Involvement* scales for both men and women. For most needs scales the proportions in the levels are close to the *theoretical* proportions or the *best* possible proportions. The notable exceptions among the needs scales are the *Socialization Failure Scale* which was shifted substantially lower for both men and women and the *Criminal Thinking Self-Report Scale* that was shifted moderately lower for women.

Stability of Scale Score Trends

Results from time series plots of the rolling median scale scores indicate very stable trends for all risk and needs scales from July 2012 through August 2013. The results indicate that the chosen study time frame effectively excluded nonrepresentative assessments that were collected during the early implementation stage. The observed trends reflect the uneven pattern of use across regions during the early stages of COMPAS implementation. Higher rolling median scores are evident prior to July 2012 for the *Violent Recidivism Risk*, *History of Violence*, *Current Violence*, *History of Noncompliance*, and *Criminal Involvement* scales.

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The rolling median scores of men on most of the needs scales run near the median in the Core Composite norm group. However, the rolling median score of men on the *Criminal Thinking Self-Report* scale runs slightly below the Core Composite norm. The relatively lower rolling median score on the *Criminal Thinking Self-Report* scale in the WIDOC DCC sample is consistent with moderate downward shifts observed in the deciles tables, quantile-quantile plots, and norm table (observed proportions). The rolling median scores of men on the the *Criminal Personality* and *Vocation Education* scales run slightly above the respective medians in the Core Composite norm. The relatively higher rolling median scores on the these scales correspond to small upward shifts observed with the other methods.

The rolling median scores of women on most of the needs scales run close to the respective median scores in the Core Composite norm. The exceptions are the *Criminal Thinking Self-Report* and *Criminal Associates* scales, which run slightly below the Core Composite median. The relatively lower median scores of women on these scales correspond to moderate shifts observed in the deciles tables, quantile-quantile plots, and norm table (observed proportions).

The rolling median scores of men on the *General Recidivism Risk*, *Violent Recidivism Risk*, and *Criminal Involvement* scales run below the median in the Core Composite Norm group, for assessments conducted during the study period from July 2012 to August 2013. The relatively lower median scores on these scales correspond to moderate shifts observed in the deciles tables, quantile-quantile plots, and norm table (observed proportions).

Similar to men, for assessments conducted during the study period from July 2012 to August 2013, the rolling median scores of women on the *General Recidivism Risk*, *Violent Recidivism Risk*, and *Criminal Involvement* scales run below the respective median scores in the Composite Norm group. The relatively lower rolling median scores on these scales correspond to moderate shifts observed with the other methods.

Summary

Results from quantile-quantile plots and deciles tables indicate that the distributions of most scales in the WIDOC study sample are aligned with the distributions in the Core Composite Norm. In addition the inspection of time series plots and proportions into the levels of the risk and needs scales lead to similar conclusions regarding the suitability of the Core Composite Norm. In general the results indicate that the Core Composite Norm is an appropriate norm group to reference for scoring deciles and making scale cuts in the WIDOC COMPAS Core application.

However results of quantile-quantile plots and deciles tables indicate substantial differences between the norm data and agency data for the *Criminal Involvement*, *Noncompliance History*, and *Violent Recidivism Risk* scales. We also observed substantial downward shifts of the proportions in the levels of the *Criminal Involvement* and *Violent Recidivism Risk* scales.

The WIDOC uses the Composite Norm Group for its COMPAS Core applications in both the Division of Adult Community Corrections and Division of Adult Institutions (DAI). The Composite Norm Group has a more serious criminal history profile in comparison to the typical probation population and a less serious criminal history profile in comparison to the typical prison population. Thus the criminal history profile of the Composite Norm Group lies between

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the profiles of the DCC and DAI populations. The Composite Norm is in a sense a compromise between the DCC and DAI. Therefore, we expect that the DCC criminal history and risk scales may be shifted lower and the DAI criminal history and risk scales may be shifted higher in comparison with the distributions of these scales in the Composite Norm Group. The advantage of using the same norm group for both applications is that this provides a common reference point and facilitates the comparison of scale decile scores and scale level scores across populations. The psychometric results for the DAI application are provided in the companion DAI norm study report.

As expected most of the DCC criminal history and risk scales are shifted lower in comparison with the distributions of these scales in the Composite Norm Group. However, the distributions of the needs scales are not shifted lower. It is likely that the distributions of many of the needs scales were affected by the triage protocol. Individuals that score medium or high on either the *Violent Recidivism Risk Scale* or the *General Recidivism Risk Scale* are assessed with the full Core scale set. In most study samples the triage protocol will result in higher scale scores on the contingent scale set because only the higher risk individuals are assessed. The effect of the triage protocol may have offset the effect of using the Composite Norm.

Recommendations

It is recommended that the WIDOC continue to use the Core Composite Norm as a reference for scoring the risk and needs scales for use with offenders at DCC intake.

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Chapter 2

Study Data

2.1 WIDOC DCC and Core Norm Samples

The Wisconsin Department of Corrections Division of Adult Community Corrections (WIDOC DCC) study sample consists of COMPAS Core assessments conducted from July 1, 2012 through August 31, 2013. The study sample consists of 25,773 individuals assessed with COMPAS Core at DCC intake. The study sample was composed by selecting the most recent *Full Core Assessment* if it existed. Otherwise the first *Primary Needs Assessment* was selected. The sample was restricted to assessments where the creating agency was DCC, the assessment reason was DCC intake, and the assessment screening date was between July 1, 2012 and August 31, 2013.

The WIDOC uses a triage assessment protocol that hinges on two COMPAS Core scale sets. The *Primary Needs* scale set includes the Criminal Involvement, Violence History, Current Violence, Criminal Associates, History of Noncompliance, Substance Abuse, Vocation Education, Criminal Thinking, Criminal Personality, Violent Recidivism Risk, and General Recidivism Risk scales. The *Primary Needs* scale set is used on all probation intakes. In the DCC sample, there are 25,733 individuals that were assessed with the *Primary Needs* scale set. Persons scoring Medium or High on either the Violent Recidivism Risk Scale or the General Recidivism Risk Scale are assessed with the *Full COMPAS Core* scale set. The *Full COMPAS Core* scale set includes the *Primary Needs* scale set (copied over) plus the Financial Problems, Family Crime, Social Environment, Leisure, Residential Instability, Social Adjustment, Socialization Failure, Criminal Opportunity, Social Isolation, and Pretrial Release Risk scales. There are 17,593 persons assessed with the *Full COMPAS Core* scale set.

Men represent 76.7% of the study sample (n=19,774), and women represent 23.3% of the study sample (n=5,999). The median age at assessment is 29.4 (M = 32.4) in the WIDOC DCC sample. The racial composition of the sample is 69.7% Caucasian, 21.1% Black, 4.2% Native American, 3.4% Latino and 1.6% other racial groups.

The COMPAS Core normative data were sampled from over 30,000 COMPAS Core assessments conducted between January 2004 and November 2005 at prison, parole, jail and probation sites across the United States. The Core Norm Group was compiled to obtain proportions of prison, parole, jail, and probation assessment data that reflect proportions of adult correctional populations in the criminal justice system. Based on recent criminal justice statistics, 21.6% of persons

under adult correctional supervision during 2011 were in prison, 12.2% were on parole, 10.5% were in jail, and 56.9% were on probation (Bureau of Justice Statistics, 2012). The Composite Norm Group consists of assessments from state prisons and parole agencies (33.8%); jails (13.6%); and probation agencies (52.6%). The Core Norm Group was constructed with proportionate subgroups to make it an appropriate composite reference group. The Core Norm includes 7,381 offenders. Men represent 76.9% of the Core Norm Group (n=5,681), and women represent 23.1% of the Core Norm Group (n=1,700). The median age at assessment is 31.0 (M = 32.6) in the Core Norm Group. The racial composition of the Core Norm Group is 61.6% Caucasian, 24.9% Black, 10.3% Latino and 3.2% other racial groups. Below we compare the WIDOC DCC Study Sample with the Composite Norm Group on several criminal history indicators.

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Comparison of Criminal History Indicators in the Core Composite Norm and WIDOC DCC Study Sample

Figure 2.1 shows a set of criminal history indicators and the percent of women and men in the WIDOC Study Sample and Core Composite Norm Group that have the indicator present. The indicators are first arrest before age 16, more than 9 prior arrests, jailed 3 or more times, current felony assault charge (VFO), two or more prior commitments, and two or more parole revocations.

The WIDOC DCC sample and the Core Composite norm group have similar criminal history profiles in terms of prior parole revocations and age at first adjudication. The Core Composite norm group looks somewhat more serious in terms of prior prison commitments, current VFO, prior jail terms, and prior arrests. Similar patterns are observed for men and women. The comparison of number of prior jail terms in the WIDOC DCC sample and the Composite Norm is affected by differences in the definition of a jail term in the norm data ("prior jail term") and the current software ("prior jail sentence of 30 days or more").

Prior arrests, age at first arrest, prior commitments, and prior parole revocations enter into the calculation of the risk scales. In the current study, the median General Recidivism Risk scores and Violent Recidivism Risk scores of men and women in the WIDOC study sample are lower than the median scores of men and women in the Core Composite Norm. In the following sections the results also show that the distributions of the Criminal Involvement Scale (prior arrests, prior commitments) and Noncompliance History Scale (prior parole revocations) in the WIDOC DCC study sample are shifted lower relative to the distributions of these scales in the Core Composite Norm group.

COMPAS Core Scales: Descriptive Statistics and Internal Consistency Reliability

Table 2.1 displays the summary statistics and internal consistency reliability coefficients (alpha) for the COMPAS Core scales in the current WIDOC DCC study sample. Generally, if the items entering a scale are highly correlated (internally consistent), then the summated scale will be reliable. Cronbach's alpha provides a convenient measure of the reliability of a scale. By convention alphas of .70 and above indicate acceptable internal consistency for most applications in the behavioral sciences. Low alphas indicate the scale has too few items or the items don't have much in common and possibly measure more than one construct (Nunnally & Bernstein, 1994).

There are twelve scales that have alpha coefficients above .70. There are four scales (Financial, Family Crime, and Residential Instability) with alpha coefficients between .66 and .69. There are three scales that have alpha coefficients well below .70 (Violence History, Current Violence, Social Adjustment, and Criminal Opportunity).

The low alphas on Violence History (.62) and Current Violence (.48) are less concerning because these scales are composed of different types of offenses that do not necessarily correlate with each other. A low alpha does not indicate a problem because the items are not expected to be highly correlated as they are in a scale. Family Crime (.66) is a similar type of index of problems experienced by family members.

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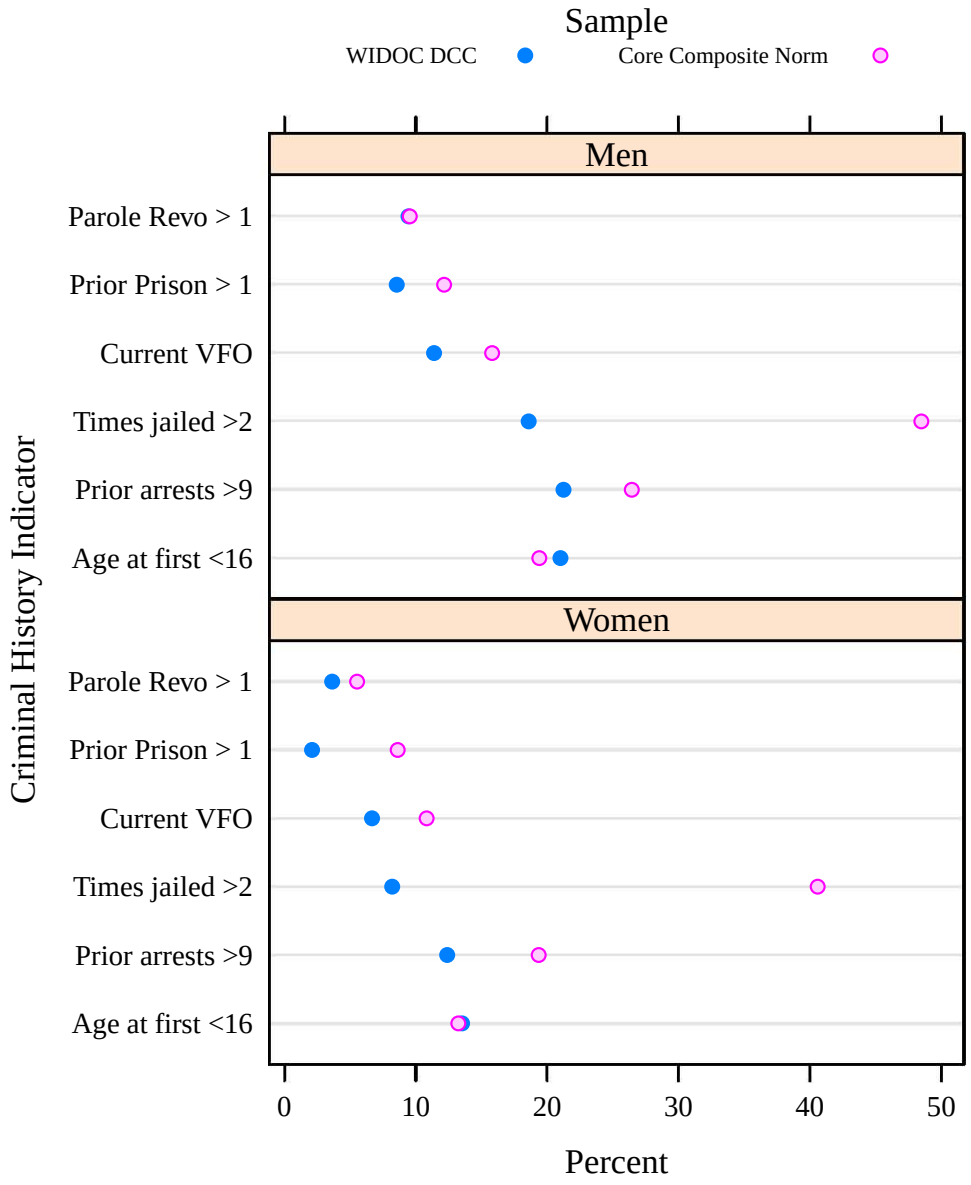

Figure 2.1: Percentage of Men and Women with Each Indicator Present in the WIDOC DCC Sample and the Core Composite Norm.

Social Adjustment (.57), Socialization Failure (.71) and Criminal Opportunity (.64) are higher order scales. They are not unidimensional. Low internal consistency is less concerning for these scales. They are composed of two or three underlying constructs each. Cronbach's alpha is less useful for higher order scales, since the multidimensionality of the higher order scales makes it difficult to ascertain what low alpha coefficients indicate. Conversely high alphas do not necessarily indicate unidimensionality.

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Table 2.1: Summary Statistics and Alpha Coeffients in the WIDOC DCC Study Sample

	Items	N	Min	Max	Mean	SD	Alpha
Criminal Involvement	4	25773	0.00	19.00	4.92	4.19	0.80
Noncompliance History	5	25773	0.00	21.00	1.78	3.40	0.81
Violence History	9	25773	0.00	19.00	1.37	2.16	0.62
Current Violence	7	25773	7.00	12.00	7.64	0.94	0.48
Criminal Associates	7	25773	7.00	22.00	9.47	2.58	0.73
Substance Abuse	10	25773	10.00	20.00	12.87	2.36	0.74
Financial Problems	5	17593	5.00	15.00	9.11	2.34	0.68
VocEd Problems	11	25773	11.00	30.00	19.00	3.90	0.71
Family Crime	6	17593	6.00	12.00	8.01	1.68	0.66
Social Environment	6	17593	6.00	12.00	6.76	1.39	0.80
Leisure	5	17593	5.00	17.00	8.93	3.48	0.80
Residential Instability	10	17593	9.00	30.00	14.92	4.15	0.69
Social Adjustment	15	17593	12.00	39.00	21.54	3.94	0.57
Socialization Failure	13	17593	7.00	32.00	12.48	3.93	0.71
Criminal Opportunity	14	17590	13.00	38.00	22.00	4.46	0.64
Social Isolation	8	17593	8.00	40.00	17.93	5.45	0.82
Criminal Thinking	10	25773	10.00	50.00	19.41	5.35	0.81
Criminal Personality	13	25773	13.00	61.00	31.56	6.60	0.74
Anger	5	25773	5.00	25.00	10.47	3.58	0.75
Violent Recidivism Risk	35	25773	−4.61	2.54	−2.13	0.97	NA
General Recidivism Risk	35	25773	−3.16	2.36	−0.51	0.81	NA
Pretrial Release Risk	14	17593	2.47	6.30	3.52	0.55	NA

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Chapter 3

Results

3.1 Examining Time Series Plots

Figure 3.1 shows a plot of the number of assessments conducted with men and women over time, from the start of implementation around June 2011 through August 2013. There was a steep increase (beginning around July 2011 and running through December 2011) in the number of assessments conducted each month, reflecting a period of wider or more intense COMPAS implementation.

Figures 3.2 through 3.5 show time series plots of median scores for the scales contained in the WIDOC *Primary Needs* scale set. The median is calculated within a rolling or moving window of 30 days. The assessment data start in September 2011 and run through August 2013. The vertical reference line (solid purple) marks the start of the time period under study (July 2012 to August 2013). The horizontal reference lines show the median in the COMPAS Core Composite Norm Group (red dashed line) and the median in the COMPAS Core Probation Norm Group (solid green line). The WIDOC DCC currently uses the Core Composite Norm Group as a reference group to set deciles cuts, which, in turn, are used to set the low, medium, and high cuts on the criminal history, needs, and risk scales.

The Composite Norm Group has a more serious criminal history profile in comparison to the typical probation population. Thus, we expect that the DCC criminal history and risk scales may be shifted lower in comparison with the distributions of these scales in the Composite Norm Group.

Note that the width of each panel is set at $\pm$ one standard deviation of the Composite Norm mean around the Composite Norm median (red dashed line). This puts each panel on approximately the same metric and makes differences between the study median and Composite Norm median comparable across scales (panels).

The plots serve two purposes: First, they allow us to examine trends in the median scale scores over time in the WIDOC Core-assessed population. Second, they permit comparisons of the median scores in the WIDOC study sample with the medians in the Core Composite Norm Group and the Core Probation Norm Group. The plots are also used to reveal trends that may point to changes in assessment protocols or changes in the composition of the population being assessed.

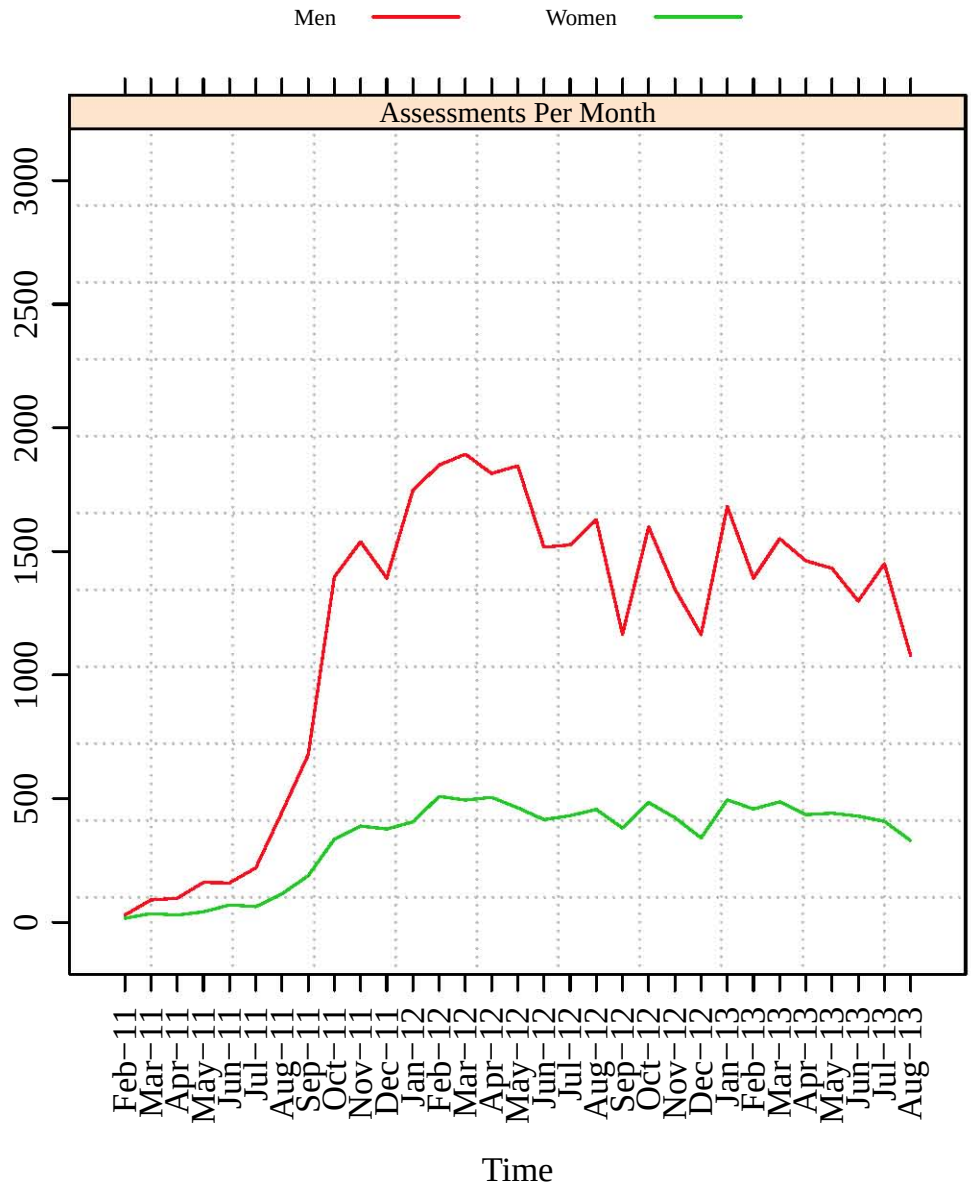

Figure 3.1: Number of Assessments Conducted with Men and Women in the WIDOC DCC Over the Study Period.

The time series plots indicate fairly stable trends in the rolling median scale scores for most of the scales over the study period from July 2012 through August 2013. Higher rolling median scores are evident prior to July 2012 for the *Violent Recidivism Risk*, *History of Violence*, *Current Violence*, *History of Noncompliance*, and *Criminal Involvement* scales. The trends gradually drop and appear to level off around July 2012. The downward trends are slightly more pronounced in the male sample. The trends for these scales coincide somewhat with the bump in the number of assessments conducted per month shown in Figure 3.1. The observed trends reflect the uneven pattern of use across the DCC regions and units during the early stages of COMPAS implementation. Some regions started conducting assessments sooner and

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at a faster pace than other regions. As each region went live, assessments were conducted in the standing population. Thus the early assessment data may not be representative of all regions.

Figure 3.2 shows the rolling median scores on the *Criminal Personality*, *Criminal Associates*, *Criminal Thinking Self-Report*, *Substance Abuse*, and *Vocation Education* scales for men. The rolling median scores of most scales in Figure 3.2 run near the median in the Core Composite norm (red dashed line). However, the rolling median score of men on the *Criminal Thinking Self-Report* scale runs slightly below the Core Composite norm (red dashed line). The relatively lower rolling median scores on the *Criminal Thinking Self-Report* scale in the WIDOC DCC sample are consistent with moderate downward shifts observed in the deciles tables, quantile-quantile plots, and norm table (observed proportions). The rolling median scores of men on the *Criminal Personality* and *Vocation Education* scales run slightly above the respective medians in the Core Composite norm. The relatively higher rolling median scores on the these scales correspond to small upward shifts observed with the other methods. Notice that the rolling median score of the *Criminal Thinking Self-Report Scale* follows the Probation Norm median and the rolling median score of the *Criminal Associates Scale* runs in-between the Composite Norm median and Probation Norm median.

Figure 3.3 shows the rolling median scores on the *Criminal Personality*, *Criminal Associates*, *Criminal Thinking Self-Report*, *Substance Abuse*, and *Vocation Education* scales for women. The rolling median scores of most scales in Figure 3.3 run close to the median in the Core Composite norm (red dashed line). The exceptions are the *Criminal Thinking Self-Report* and *Criminal Associates* scales, which run slightly below the Core Composite median.

The relatively lower median scores of women on the *Criminal Thinking Self-Report* and *Criminal Associates* scales in the WIDOC DCC sample correspond to moderate shifts observed in the deciles tables, quantile-quantile plots, and norm table (observed proportions).

Figure 3.4 shows the rolling median scores on the *General Recidivism Risk*, *Violent Recidivism Risk*, *History of Violence*, *Current Violence*, *History of Noncompliance*, and *Criminal Involvement* scales for men. The rolling median scores of men on the *General Recidivism Risk*, *Violent Recidivism Risk*, and *Criminal Involvement* scales run below the median in the Core Composite Norm group, for assessments conducted during the study period from July 2012 to August 2013. The relatively lower median scores on these scales correspond to moderate shifts observed in the deciles tables, quantile-quantile plots, and norm table (observed proportions).

The rolling median risk scale scores of women are shown in Figure 3.5. Similar to men, for assessments conducted during the study period from July 2012 to August 2013, the rolling median scores of women on the *General Recidivism Risk*, *Violent Recidivism Risk*, and *Criminal Involvement* scales run below the respective median scores in the Composite Norm group. The relatively lower rolling median scores on these scales correspond to moderate shifts observed with the other methods. The rolling median scores of women on the *Violent History* and *Current Violence* scales run above the median scores for these scales in the Composite Norm Group. However, the higher rolling median scores on these scales do not correspond to upward shifts in the proportions in each level of the respective scales. These scales have severe positive skew, which biases the rolling medians upward relative to the overall medians, which are zero in both the norm group and the WIDOC DCC sample.

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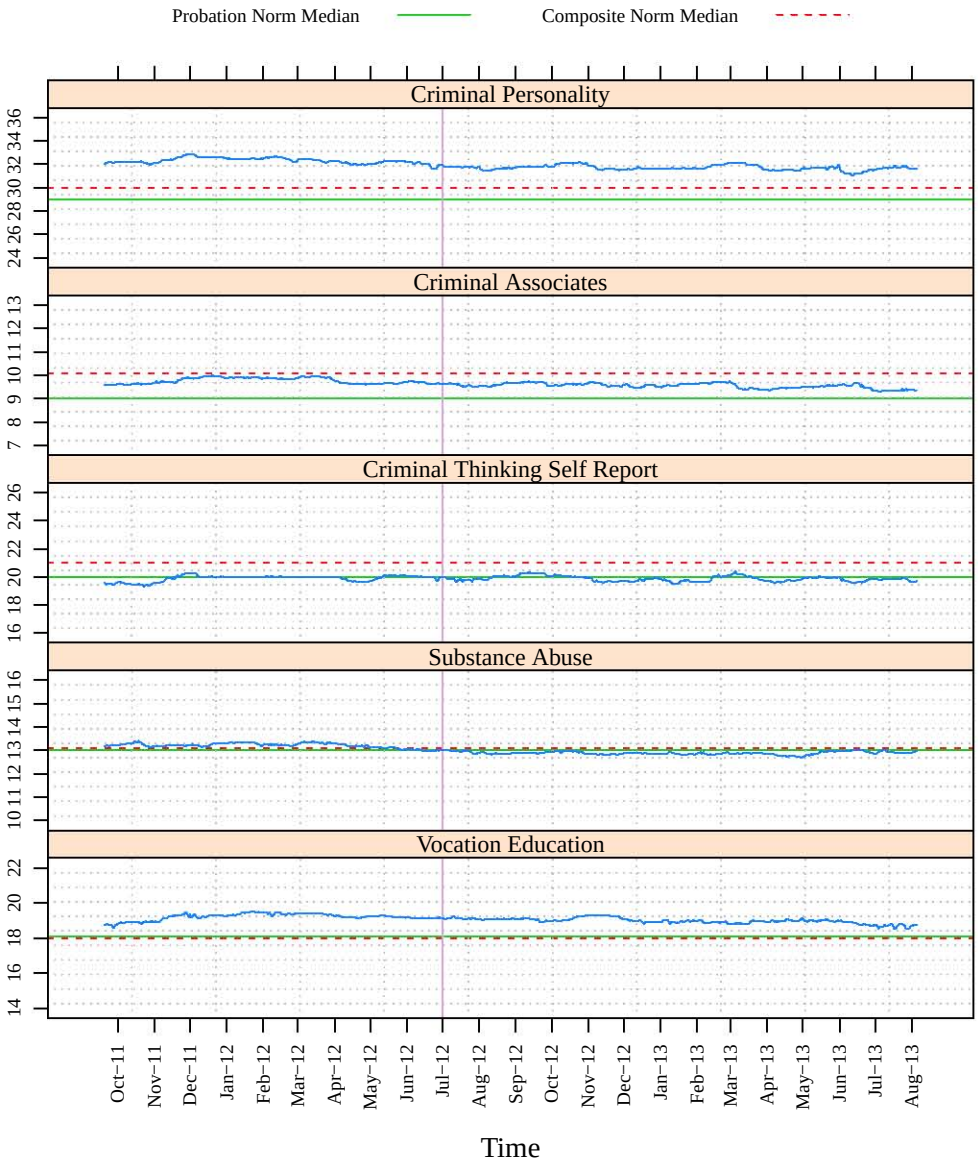

Figure 3.2: Rolling Median Scores in the WIDOC DCC Sample: Men Core Needs.

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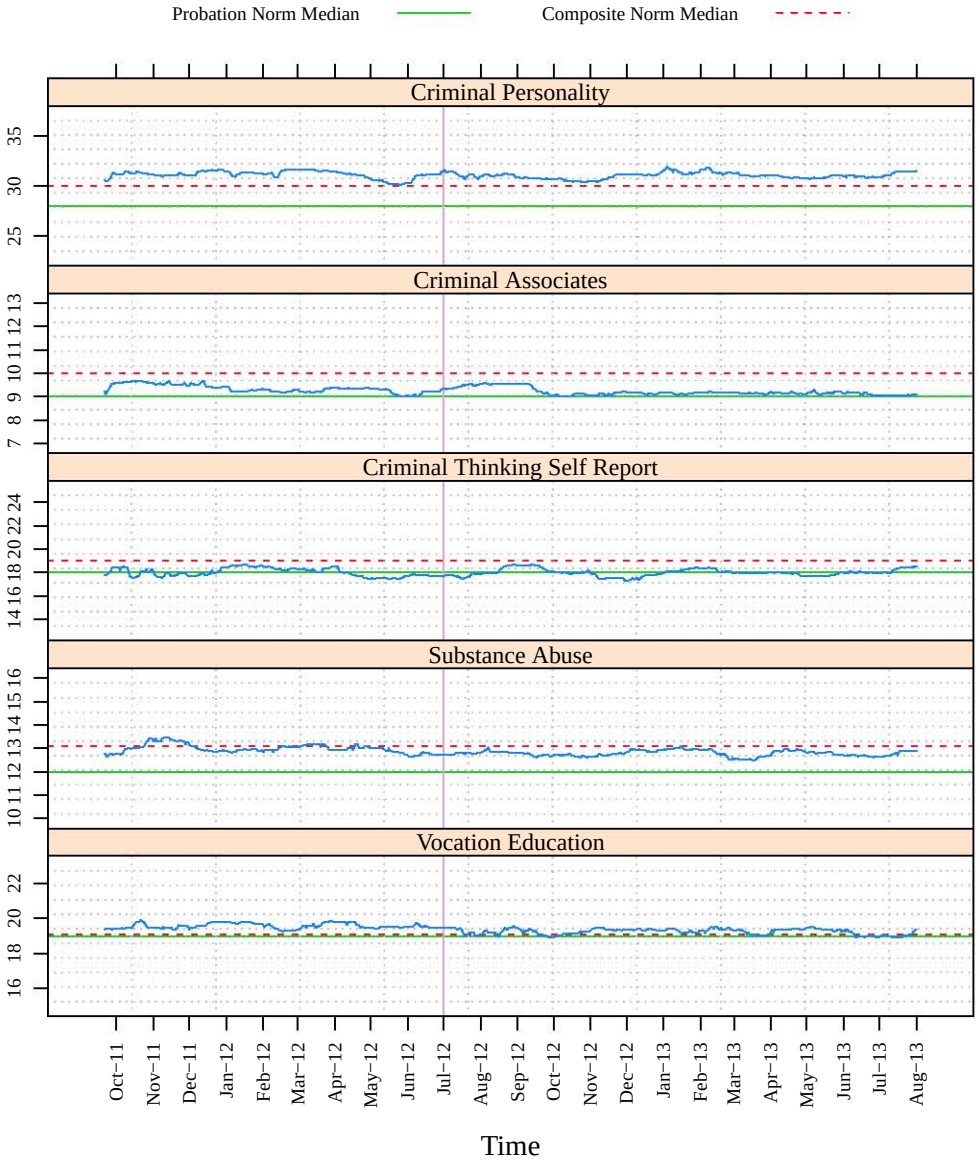

Figure 3.3: Rolling Median Scores in the WIDOC DCC Sample: Women Core Needs.

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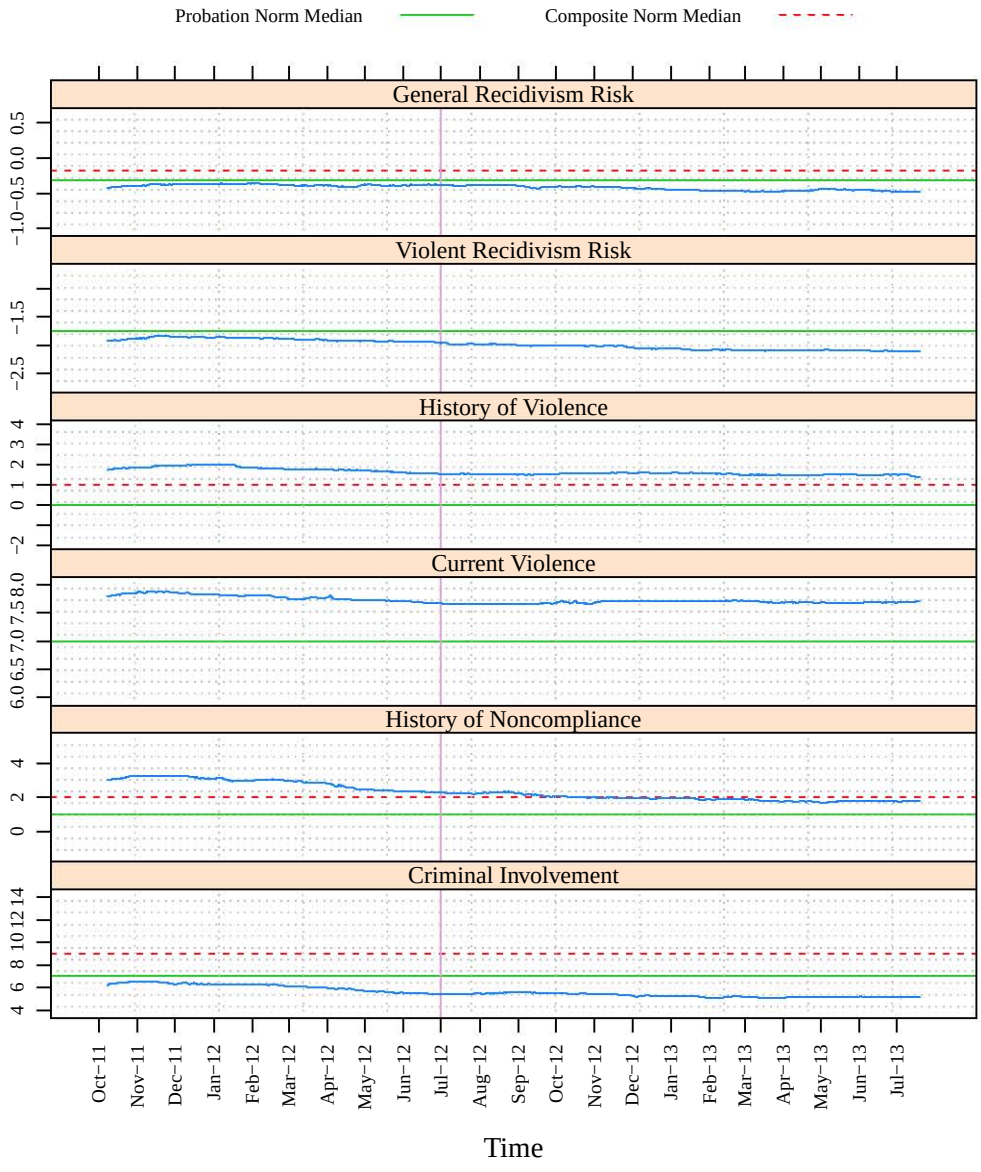

Figure 3.4: Rolling Median Scores in the WIDOC DCC Sample: Men Core Risks.

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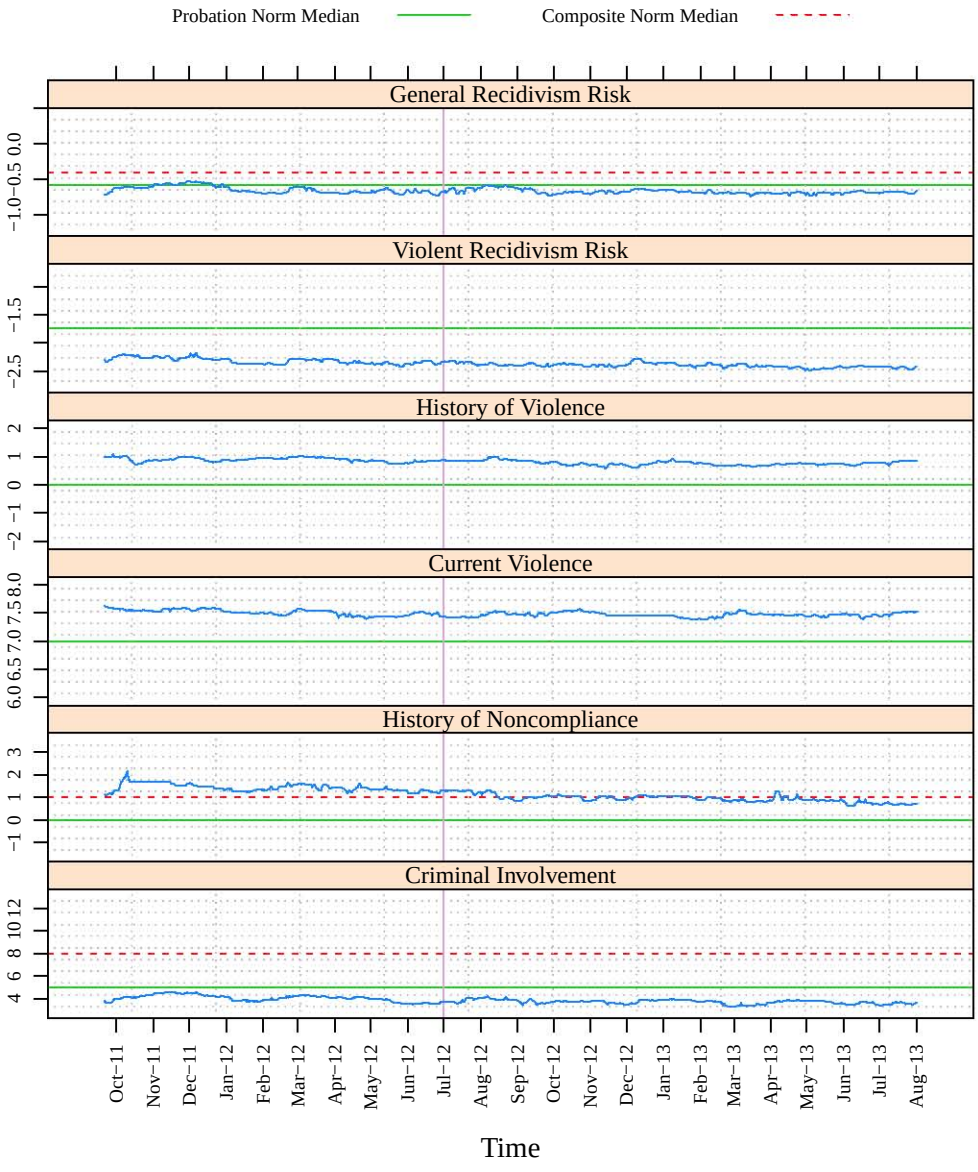

Figure 3.5: Rolling Median Scores in the WIDOC DCC Sample: Women Core Risks.

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3.2 Comparison of the Scale Distributions

Scoring and Interpreting Decile Scores

The following is a review of decile scores and their interpretation that will be helpful in understanding the results in the next section in which the distributions of the scale scores in the WIDOC study sample are compared with the distributions of the scale scores in the COMPAS Core Composite Norm data.

The COMPAS scale scores are transformed into deciles. Deciles are obtained by ranking the scale scores of a normative group in ascending order and then dividing these scores into ten equal sized groups. Deciles range from 1 (lowest) to 10 (highest). These scores thus proceed in roughly 10% steps from lowest to highest (1 through 10). A decile rank of 1 indicates that the scale score is in the lowest 10% of all scores in the normative group. A decile rank of 2 places the scale score above 10% and below 20% of the scores, and so on, up to a decile of 10, which places the scale score in the top 10% of all scores in the normative group.

The decile rank is used to locate a particular offender's scale score in relation to the scale scores of offenders in the normative group. In the current version of COMPAS, scale scores can be referenced to the scale distributions of eight normative groups: (1) male prison/parole, (2) male jail, (3) male probation, (4) male composite, (5) female prison/parole, (6) female jail, (7) female probation and (8) female composite.

In general the decile rank has the following interpretation:

- 1 – 4: scale score is low relative to other offenders in norm group.
- 5 – 7: scale score is medium relative to other offenders in norm group.
- 8 – 10: scale score is high relative to other offenders in norm group.

Note however that the location of the decile cut-points vary depending on the type of COMPAS scale. Table 3.1 shows the cutting points for each type of COMPAS scale. Table 3.2 lists each COMPAS scale and its type.

Table 3.1: Cutting Points for COMPAS Scale Types.

Type 1	Low (1-4)	Medium (5-7)	High (8-10)
Type 2	Unlikely (1-2)	Probable (3-4)	Highly Probable (5-10)
Type 3	Unlikely (1-5)	Probable (6-7)	Highly Probable (8-10)
Type 4	Unlikely (1-4)	Probable (5-7)	Highly Probable (8-10)

It is important to note that decile scores can only be interpreted in a relative sense, and are always linked to the norm group. If, for example, the norm group that is referenced for decile scoring of the Violent Recidivism Risk Scale happens to consist of offenders at high risk of violent recidivism, then low decile scores would not necessarily indicate low risk of violent recidivism. Similarly, if the norm group happens to consist mainly of offenders with low risk of violent

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Table 3.2: COMPAS Scales and Types.

Scale	Scale Type
Violent Recidivism Risk	1
General Recidivism Risk	1
Pretrial Release Risk	1
Criminal Involvement	1
History of Non Compliance	1
History of Violence	1
Current Violence	1
Criminal Associates/Peers	4
Substance Abuse	2
Financial Problems/Poverty	3
Vocational/Education Problems	3
Criminal Thinking	3
Family Criminality	3
Social Environment Problems	3
Leisure and Recreation	3
Residential Instability	3
Social Adjustment Problems	3
Socialization Failure	3
Criminal Opportunity	3
Criminal Personality	3
Social Isolation	3

recidivism, the decile scores for Violent Recidivism Risk would be biased in the other direction – high scores could be associated with individuals who are actually not high risk for violent recidivism.

It is also important to note that for some scales, it is not always possible to break the sample into ten groups of exactly equal size. Hence, for some scales it was necessary to skip over some decile scores.

When it was not possible to divide the sample into ten groups, an algorithm was used to identify cutting points that divided the offenders into as many roughly equal-sized groups as possible and that used the full range of decile values (i.e., 1-10).

The issue of clumping affects a limited number of scales. In addition to the Violence History, other COMPAS scales that exhibit clumping of decile ranks include Current Violence, Family Crime, and Social Environment. Overall, the use of decile ranks has clear advantages over the use of raw scale scores in terms of interpretability. Low scores (e.g., 1 thru 4) directly reflect the lowest ends of the distribution, and high scores (e.g., 8 thru 10) reflect the highest ends of the distribution.

In the following section we compare the distributions of the scales in the Core COMPAS Core Composite Norm data with the scale distributions in the WIDOC study sample (n=25,773). For each scale, we compare the distributions in the WIDOC study sample and the current default COMPAS Core Composite Norm. For the comparisons with the norm groups we examine

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quantile-quantile plots, density plots, box plots, and deciles tables.

Explanation of Distribution Plots

In the following sections we use different plots to examine the scale distributions in the norm group and study sample. Here we provide brief definitions of the distribution plots to help the reader interpret the results that we present in the next sections.

A **quantile-quantile plot** is a method used to compare scale distributions from different samples. The distributions are compared by plotting the quantiles of one distribution against the corresponding quantiles of the other distribution. Quantiles are cuts made at regular intervals on a scale distribution to obtain equal-sized subsets of the data. For example if the data are sorted and cut into 10 equal-sized subsets, the quantiles (cutpoints) are called deciles. The quantile-quantile plot is useful for the norm study work because the COMPAS system relies on decile scores. If the distributions in the samples being compared are similar, their plotting points will fall along the 45 degree reference line. A line that is parallel to the diagonal line and above it indicates the distribution plotted on the vertical axis is shifted upward and has a higher mean but similar skew and dispersion in comparison to the distribution plotted on the horizontal axis. If the trend of the plot is flatter than the 45 degree reference line, this indicates the the distribution plotted on the horizontal axis is more dispersed. Conversely, if the trend of the plot is steeper than the 45 degree reference line, this indicates the the distribution plotted on the vertical axis is more dispersed. If the line is curved above the 45 degree reference line, this indicates that the distribution plotted on the horizontal axis is more skewed to the right (long tail of lower scores to the right of the distribution).

A **density plot** is a smoothed version of the histogram. The area under the density curve is equal to 1.0. The area under the density curve between any two scale values (a <= X <= b) gives the proportion of scale scores in this range. The overlaid curves compare the shape of the two distributions. Peaks in the curve indicate a high frequency (density) of scores of similar value.

A **box plot** is another method of examining a scale distribution. The horizontal line inside the box is the median. The upper and lower ends of the box describe the interquartile range of the scale (from the 25th percentile to the 75th percentile). Thus 50% of the scale scores fall in this range. The length of the box represents the spread of the scale scores. A box that is squat indicates the midrange scores are concentrated around the median. If the distance from the median to the upper quartile is different than the distance from the median to the lower quartile, then this indicates the distribution is skewed. The vertical lines extending from the top and bottom of the box indicate the distance to adjacent scores (within 1.5 times the interquartile range plus the upper or lower quartile range). Extreme values outside the adjacent range (outside values), if they exist, are represented by a dot at the end of the vertical line.

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3.2.1 Criminal Involvement Scale

Table 3.3: Criminal Involvement

Item	Information
n_jail	How many times has this person been sentenced to jail for 30 days or more? [**Answers:** 0=0; 1=1; 2=2; 3=3; 4=4; 5+=5]
n_prison	How many times has this person been sentenced (new commitment) to state or federal prison (include current)? [**Answers:** 0=0; 1=1; 2=2; 3=3; 4=4; 5+=5]
n_probations	How many times has this person been sentenced to probation as an adult? [**Answers:** 0=0; 1=1; 2=2; 3=3; 4=4; 5+=5]
t_prev_arrests	How many times has this person been arrested before as an adult or juvenile (criminal arrests only)? [TextBox])

Criminal Involvement Distribution Plots

Figure 3.6 shows a set of distribution plots of the Criminal Involvement Scale. The plots compare the Criminal Involvement Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie below the diagonal reference line, indicating the Criminal Involvement Scale distributions in the WIDOC DCC Sample are shifted lower relative to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.6 indicate that the Criminal Involvement Scale distributions in the WIDOC DCC Sample and Core Composite Norm Group have dissimilar shapes. The distributions of both men and women in the WIDOC sample have peaks (higher density) of low scores. The box plots (c) in Figure 3.6 indicate a higher median and more spread in the Criminal Involvement Scale distributions for men and women in the Composite Norm Group. The men's distribution in the WIDOC sample has more right skew.

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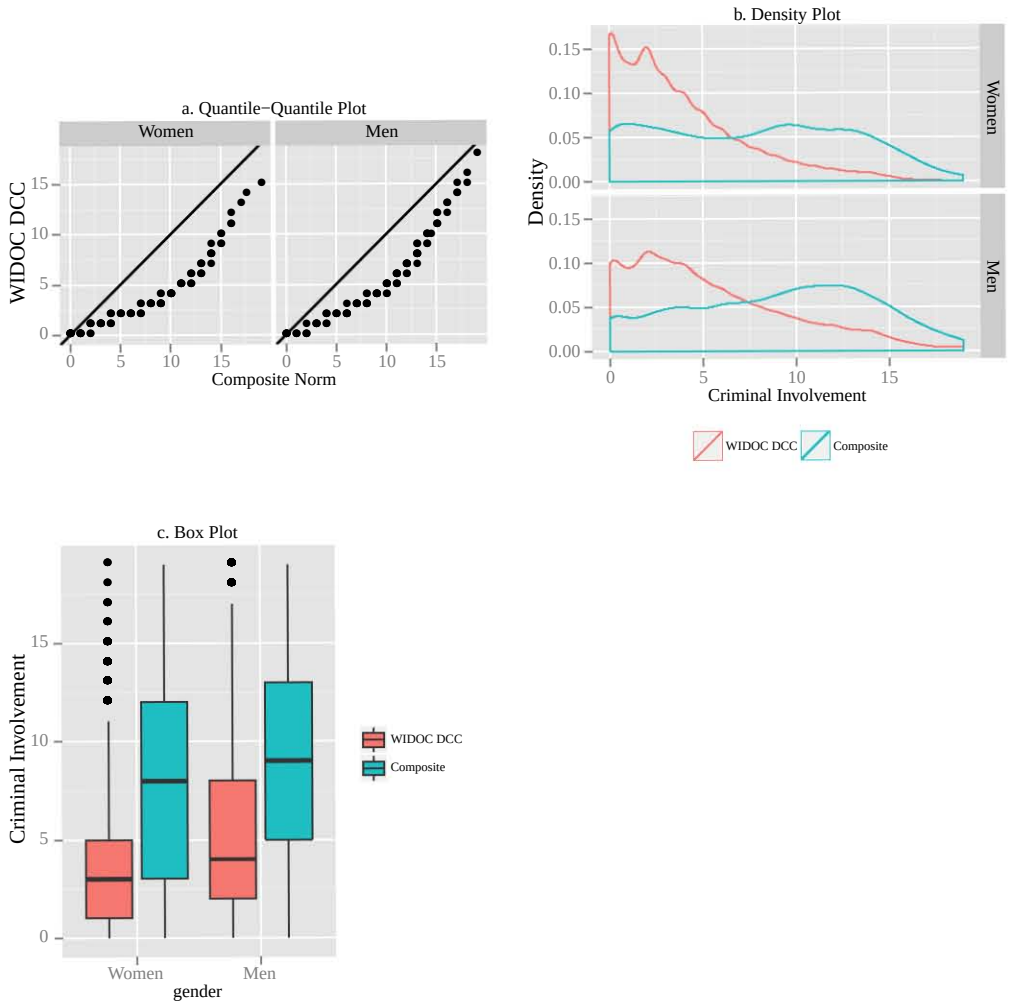

Figure 3.6: Distribution Plots of the Criminal Involvement Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Criminal Involvement Scale Deciles Comparison

Table 3.4 compares the Criminal Involvement Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Criminal Involvement Scale, the decile cutting points for determining low, medium, and high scores are located at the 5th decile (50th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Criminal Involvement Scale score of 14 would be located at D8 and scored High. A scale score of 14 is located at D10 for men in the WIDOC DCC sample and would be scored High if the agency data were used as the reference for making the cuts.

Table 3.4: Criminal Involvement Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	0	2	4	6	8	10	11	13	15	19
Women DCC	0	1	1	2	3	4	5	6	9	19
Men Composite	2	4	6	8	9	11	12	14	15	19
Men DCC	0	1	2	3	4	5	7	9	12	19

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3.2.2 Noncompliance History Scale

Table 3.5: Non-Compliance History

Item	Information
n_parole_return	How many times has this person been returned to prison while on parole? [**Answers:** 0=0; 1=1; 2=2; 3=3; 4=4; 5+=5]
n_parole_revo	How many times has this person violated his or her parole? [**Answers:** 0=0; 1=1; 2=2; 3=3; 4=4; 5+=5]
n_prob_arrest	How many times has this person had a new charge/arrest while on probation? [**Answers:** 0=0; 1=1; 2=2; 3=3; 4=4; 5+=5]
n_prob_revo	How many times has this person's probation been violated or revoked? [**Answers:** 0=0; 1=1; 2=2; 3=3; 4=4; 5+=5]
probpar	Was this person on probation or parole at the time of the current offense? [**Answers:** Probation=1; Parole=1; Both=1; Neither=0]

Noncompliance History Distribution Plots

Figure 3.7 shows a set of distribution plots of the Noncompliance History Scale. The plots compare the Noncompliance History Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie below the diagonal reference line, indicating the Noncompliance History Scale distributions in the WIDOC DCC sample are shifted lower relative to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.7 indicate that the Noncompliance History Scale distributions in the WIDOC DCC Sample and Core Composite Norm Group have similar shapes, but the coarseness of the data make the density plots difficult to interpret. The distributions of both men and women in the WIDOC study sample have distinct peaks (higher density) at values near zero. The box plots (c) in Figure 3.7 indicate that men and women in the norm group have higher medians than men and women in the WIDOC study sample. The distributions in the norm group have more spread and less skew in comparison to the distributions in the WIDOC sample.

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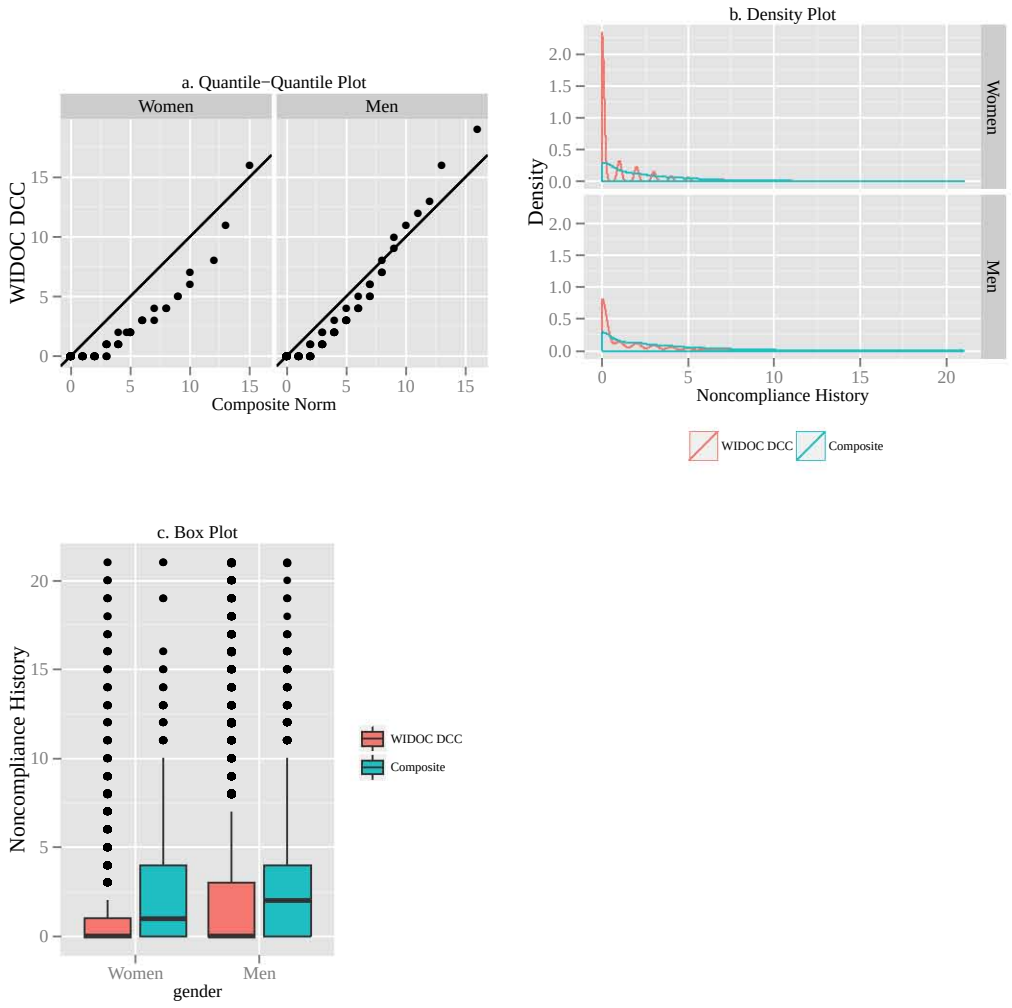

Figure 3.7: Distribution Plots of the Noncompliance History Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Noncompliance History Scale Deciles Comparison

Table 3.6 compares the Noncompliance History Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Noncompliance History Scale, the decile cutting points for determining low, medium, and high scores are located at the 5th decile (50th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Noncompliance History Scale score of 5 would be located at D8 and scored High. A scale score of 5 is located at D9 for men in the WIDOC DCC sample and would be scored High if the agency data were used as the reference for making the cuts.

Table 3.6: Noncompliance History Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	0	0	0	1	1	2	3	4	7	21
Women DCC	0	0	0	0	0	0	1	2	3	21
Men Composite	0	0	0	1	2	3	4	5	8	21
Men DCC	0	0	0	0	0	1	2	3	7	21

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3.2.3 Violence History Scale

Table 3.7: Violence History

Item	Information
domviol	How many prior family violence offense arrests as an adult? [**Answers:** 0=0; 1=1; 2=2; 3+=3]
fights_inmate	Has this person, while incarcerated in jail or prison, ever received serious or administrative disciplinary infractions for fighting/threatening other inmates or staff? [**Answers:** No=0; Yes=1]
homicide	How many prior murder/voluntary manslaughter offense arrests as an adult? [**Answers:** 0=0; 1=1; 2=2; 3+=3]
juv_vfelony	How many prior juvenile violent felony offense arrests? [**Answers:** 0=0; 1=1; 2+=2]
n_fel_assault	How many prior felony assault offense arrests (not murder, sex, or domestic violence) as an adult? [**Answers:** 0=0; 1=1; 2=2; 3+=3]
n_misd_assault	How many prior misdemeanor assault offense arrests (not sex or domestic violence) as an adult? [**Answers:** 0=0; 1=1; 2=2; 3+=3]
n_violent_property	How many times has this person been arrested for a felony property offense that included an element of violence? [**Answers:** 0=0; 1=1; 2=2; 3=3; 4=3; 5+=3]
sex_force	How many prior sex offense arrests (with force) as an adult? [**Answers:** 0=0; 1=1; 2=2; 3+=3]
weapons_offense	How many prior weapons offense arrests as an adult? [**Answers:** 0=0; 1=1; 2=2; 3+=3]

Violence History Distribution Plots

Figure 3.8 shows a set of distribution plots of the Violence History Scale. The plots compare the Violence History Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie a little below the diagonal reference line, indicating the Violence History Scale distributions in the WIDOC DCC sample are shifted lower relative to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.8 indicate that the Violence History Scale distributions in the WIDOC DCC Sample and Core Composite Norm Group have similar shapes, but the coarseness of the data make the density plots difficult to interpret. The distributions of both men and women in the WIDOC study sample have somewhat higher peaks (higher density) at values near zero. The box plots (c) in Figure 3.8 indicate that the median scores of men and women in the WIDOC

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sample are the same as their counterparts in the norm group. The distributions of men have more spread and less skew in comparison to the distributions women.

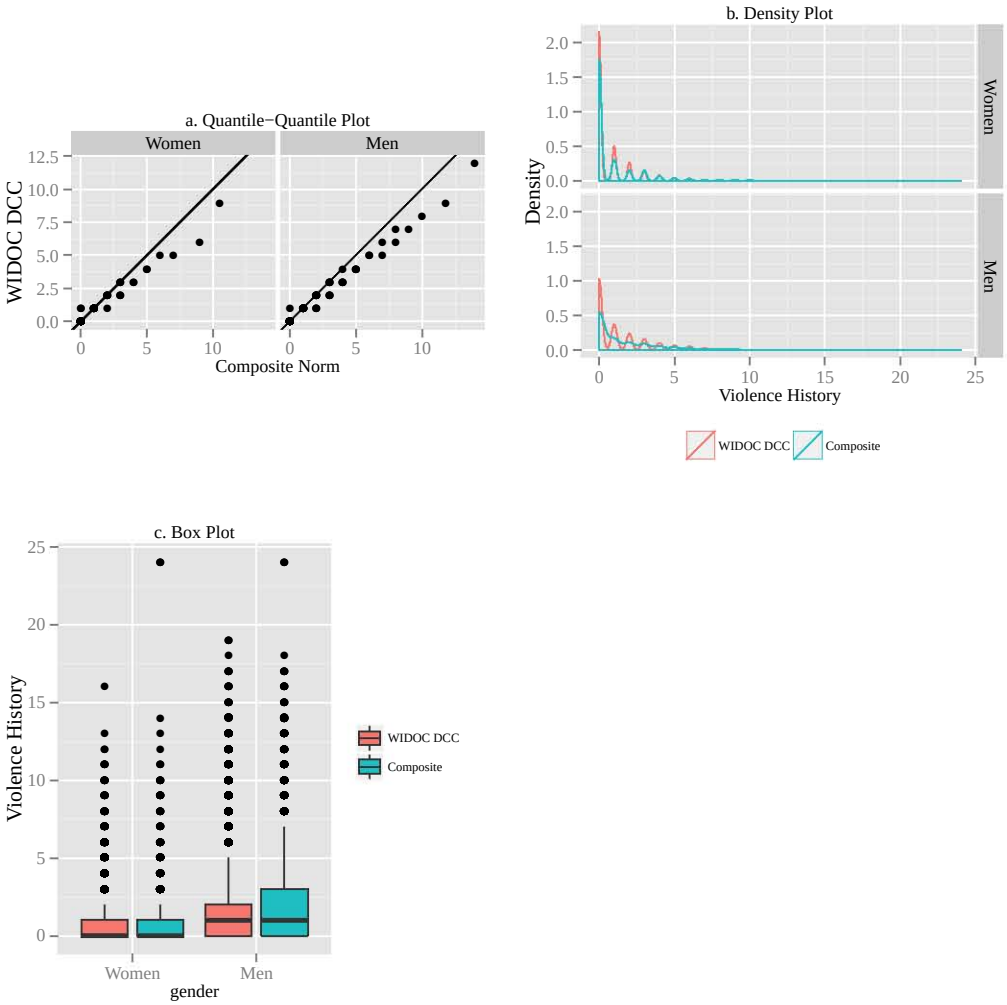

Figure 3.8: Distribution Plots of the Violence History Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Violence History Scale Deciles Comparison

Table 3.8 compares the Violence History Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Violence History Scale, the decile cutting points for determining low, medium, and high scores are located at the 5th decile (50th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Violence History Scale score of 3 would be located at D8 and scored High. A scale score of 3 is located at D8 for men in the WIDOC DCC sample and would be scored High if the agency data were used as the reference for making the cuts.

Table 3.8: Violence History Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	0	0	0	0	0	0	1	1	3	24
Women DCC	0	0	0	0	0	0	1	1	3	16
Men Composite	0	0	0	0	1	1	2	3	5	24
Men DCC	0	0	0	0	1	1	2	3	5	19

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3.2.4 Current Violence Scale

Table 3.9: Current Violence

Item	Information
crime_cat	Which offense category represents the most serious current offense? [**Answers:** Misdemeanor=1; Non-violent Felony=1; Violent Felony=2]
curr_assault	Assault [CheckBox])
curr_domviol	Do any current offenses involve family violence? [**Answers:** No=1; Yes=2]
curr_homicide	Homicide [CheckBox])
curr_robbery	Robbery [CheckBox])
curr_sex	Sex Offense with Force [CheckBox])
curr_weapons	Weapons [CheckBox])

Current Violence Distribution Plots

Figure 3.9 shows a set of distribution plots of the Current Violence Scale. The plots compare the Current Violence Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie near the diagonal reference line, indicating the distributions in the WIDOC sample are similar to the distributions in the Composite Norm group. The alignment of the quantiles in the plot is difficult to discern because the Current Violence Scale distribution has positive skew (high frequency of low scores with a long tail of higher scores our to the right). The plotting points are sparse at the upper end of the scale. The alignment of the two distributions is easier to see in the deciles table (see Table 3.10). The density plots (b) in Figure 3.9 indicate that the Current Violence Scale distributions in the WIDOC Sample and Composite Norm Group have similar shapes. There are peaks (higher density) at values near 0, 8, 9 and 10. The box plots (c) in Figure 3.9 indicate that the median scores of women and men in the WIDOC sample are the same as the respective medians of women and men in the norm group.

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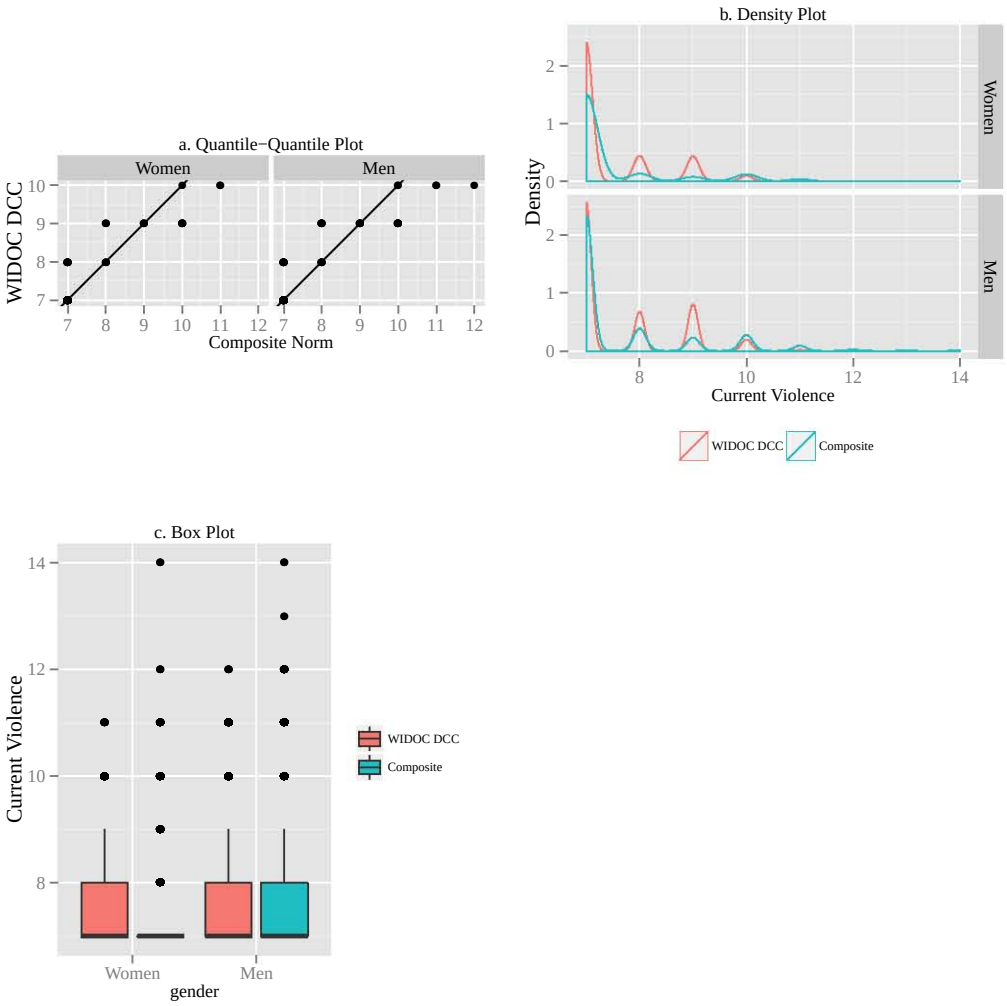

Figure 3.9: Distribution Plots of the Current Violence Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Current Violence Scale Deciles Comparison

Table 3.10 compares the Current Violence Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Current Violence Scale, the decile cutting points for determining low, medium, and high scores are located at the 5th decile (50th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Current Violence Scale score of 8 would be located at D8 and scored High. A scale score of 8 is located at D7 for men in the WIDOC DCC sample and would be scored Medium if the agency data were used as the reference for making the cuts.

Table 3.10: Current Violence Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	7	7	7	7	7	7	7	8	9	14
Women DCC	7	7	7	7	7	7	7	8	9	11
Men Composite	7	7	7	7	7	7	7	8	10	14
Men DCC	7	7	7	7	7	7	8	9	9	12

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3.2.5 Criminal Associates Scale

Table 3.11: Criminal Associates/Peers

Item	Information
friends_arrest	How many of your friends/acquaintances have ever been arrested? [**Answers:** None=1; Few=2; Half=3; Most=4]
friends_drugs	How many of your friends/acquaintances are taking illegal drugs regularly (more than a couple times a month)? [**Answers:** None=1; Few=2; Half=3; Most=4]
friends_gang	How many of your friends/acquaintances are gang members? [**Answers:** None=1; Few=2; Half=3; Most=4]
friends_jail	How many of your friends/acquaintances served time in jail or prison? [**Answers:** None=1; Few=2; Half=3; Most=4]
gang_member	Are you now a gang member? [**Answers:** No=1; Yes=2]
gang_obs	Based on the screener's observations, is this person a suspected or admitted gang member? [**Answers:** No=1; Yes=2]
prev_gang_mem	Have you ever been a gang member? [**Answers:** No=1; Yes=2]

Criminal Associates Distribution Plots

Figure 3.10 shows a set of distribution plots of the Criminal Associates Scale. The plots compare the Criminal Associates Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie below the diagonal reference line, indicating the Criminal Associates Scale distributions in the WIDOC DCC Sample are shifted lower relative to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.10 indicate that the Criminal Associates Scale distributions in the WIDOC DCC Sample and Core Composite Norm Group have similar shapes. The distributions in the WIDOC sample have higher peaks (higher density) near lower scale values. The box plots (c) in Figure 3.10 indicate that women and men in the norm group have higher median scores compared to women and men in the WIDOC sample. The distributions have similar spread and skew, except that the distribution of women in the norm group has less skew.

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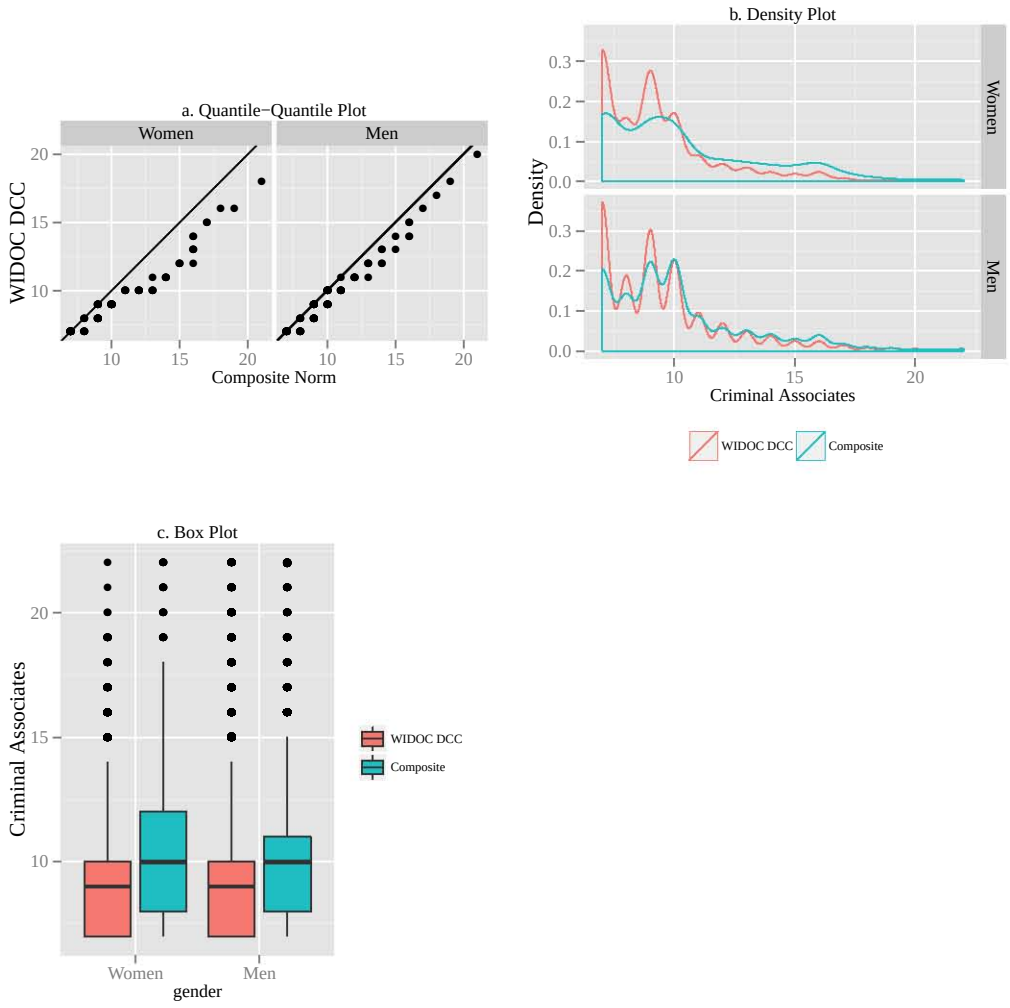

Figure 3.10: Distribution Plots of the Criminal Associates Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Criminal Associates Scale Deciles Comparison

Table 3.12 compares the Criminal Associates Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Criminal Associates Scale, the decile cutting points for determining low, medium, and high scores are located at the 5th decile (50th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Criminal Associates Scale score of 12 would be located at D8 and scored Highly Probable. A scale score of 12 is located at D9 for men in the WIDOC DCC sample and would be scored Highly Probable if the agency data were used as the reference for making the cuts.

Table 3.12: Criminal Associates Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	7	7	8	9	10	10	11	13	16	22
Women DCC	7	7	8	8	9	9	10	10	12	22
Men Composite	7	8	8	9	10	10	11	12	15	22
Men DCC	7	7	8	9	9	9	10	11	13	22

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3.2.6 Substance Abuse Scale

Table 3.13: Substance Abuse

Item	Information
a_current	Were you using alcohol or under the influence when arrested for your current offense? [**Answers:** No=1; Yes=2]
blame_drugs	Do you think your current/past legal problems are partly because of alcohol or drugs? [**Answers:** No=1; Yes=2]
curr_dui	DUI/OUIL [CheckBox])
current_treatment	Are you currently in formal treatment for alcohol or drugs such as counseling, outpatient, inpatient, residential? [**Answers:** No=1; Yes=2]
d_current	Were you using drugs or under the influence when arrested for your current offense? [**Answers:** No=1; Yes=2]
ever_rx_a	Have you ever been in formal treatment for alcohol such as counseling, outpatient, inpatient, residential? [**Answers:** No=1; Yes=2]
ever_rx_d	Have you ever been in formal treatment for drugs such as counseling, outpatient, inpatient, residential? [**Answers:** No=1; Yes=2]
juv_drugs	Did you use heroin, cocaine, crack or methamphetamines as a juvenile? [**Answers:** No=1; Yes=2]
want_rx_a	Do you think you would benefit from getting treatment for alcohol? [**Answers:** No=1; Yes=2]
want_rx_d	Do you think you would benefit from getting treatment for drugs? [**Answers:** No=1; Yes=2]

Substance Abuse Distribution Plots

Figure 3.11 shows a set of distribution plots of the Substance Abuse Scale. The plots compare the Substance Abuse Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie near the diagonal reference line, indicating the Substance Abuse Scale distributions in the WIDOC DCC Sample are similar to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.11 indicate that the Substance Abuse Scale distributions in the WIDOC DCC Sample

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and Core Composite Norm Group have similar shapes. The box plots (c) in Figure 3.11 indicate that women and men in the WIDOC sample have the same median scores as their counterparts in the norm group. The distributions in the WIDOC sample are similar to the distributions in the norm group in terms of spread and skew.

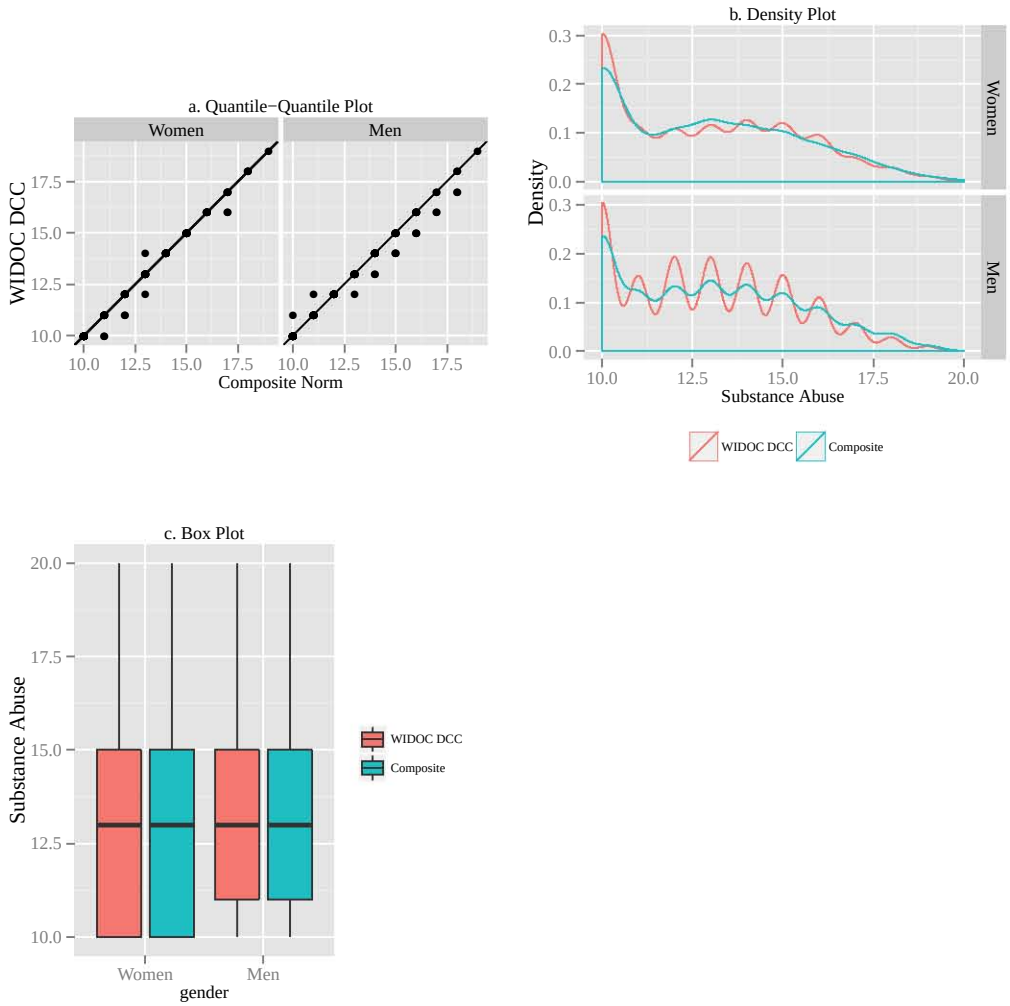

Figure 3.11: Distribution Plots of the Substance Abuse Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Substance Abuse Scale Deciles Comparison

Table 3.14 compares the Substance Abuse Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Substance Abuse Scale, the decile cutting points for determining low, medium, and high scores are located at the 3rd decile (30th percentile) and 5th decile (50th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Substance Abuse Scale score of 15 would be located at D8 and scored Highly Probable. A scale score of 15 is located at D8 for men in the WIDOC DCC sample and would be scored Highly Probable if the agency data were used as the reference for making the cuts.

Table 3.14: Substance Abuse Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	10	10	11	12	13	13	14	15	16	20
Women DCC	10	10	11	12	13	13	14	15	16	20
Men Composite	10	10	11	12	13	14	14	15	16	20
Men DCC	10	10	11	12	13	13	14	15	16	20

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3.2.7 Financial Problems Scale

Table 3.15: Financial

Item	Information
fam_conflicts	How often do you have conflicts with friends/family over money? [**Answers:** Often=3; Sometimes=2; Never=1]
get_by	How often do you have barely enough money to get by? [**Answers:** Often=3; Sometimes=2; Never=1]
pay_bills	How often do you have trouble paying bills? [**Answers:** Often=3; Sometimes=2; Never=1]
welfare	Do you frequently get jobs that donâĂŹt pay more than minimum wage? [**Answers:** Often=3; Sometimes=2; Never=1]
worry_survive	How often do you worry about financial survival? [**Answers:** Often=3; Sometimes=2; Never=1]

Financial Problems Distribution Plots

Figure 3.12 shows a set of distribution plots of the Financial Problems Scale. The plots compare the Financial Problems Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie slightly above the diagonal reference line, indicating the Financial Problems Scale distributions in the WIDOC sample are similar to the distributions in the Core Composite Norm Group. The density plots (b) in Figure **??** indicate that the Financial Problems Scale distributions in the WIDOC Sample and Core Composite Norm Group have similar shapes. The box plots (c) in Figure **??** indicate a higher median for men and women in the WIDOC study sample. The men's distribution in the WIDOC study sample has more spread than the men's distribution in the norm group and less skew in comparison with the other distributions.

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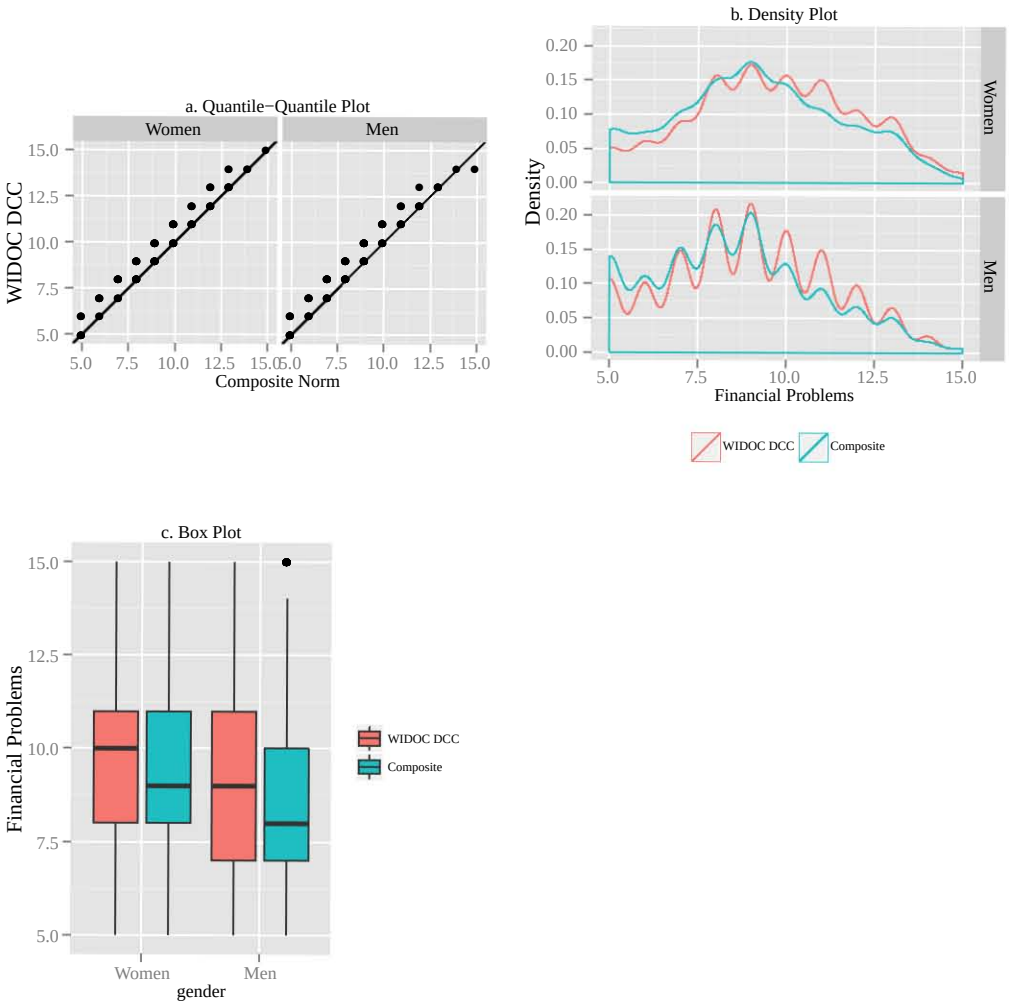

Figure 3.12: Distribution Plots of the Financial Problems Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Financial Problems Scale Deciles Comparison

Table 3.16 compares the Financial Problems Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Financial Problems Scale, the decile cutting points for determining low, medium, and high scores are located at the 6th decile (60th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Financial Problems Scale score of 11 would be located at D8 and scored Highly Probable. A scale score of 11 is located at D8 for men in the WIDOC DCC sample and would be scored Highly Probable if the agency data were used as the reference for making the cuts.

Table 3.16: Financial Problems Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	6	7	8	9	9	10	10	11	13	15
Women DCC	6	8	8	9	10	10	11	12	13	15
Men Composite	5	6	7	8	8	9	10	11	12	15
Men DCC	6	7	8	8	9	9	10	11	12	15

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3.2.8 Voced Problems Scale

Table 3.17: Vocational/Education

Item	Information
chance_success_work	Right now, if you were to get (or have) a good job how would you rate your chance of being successful? [**Answers:** Good=1; Fair=2; Poor=3]
expelled	Were you ever suspended or expelled from school? [**Answers:** No=1; Yes=2]
fail_or_repeat_grd	Did you fail or repeat a grade level? [**Answers:** No=1; Yes=2]
ged	Did you receive a GED? [**Answers:** No=0; Yes=1]
grades_hs	What were your usual grades in high school? [**Answers:** A=1; B=2; C=3; D=4; E/F=5; Did Not Attend=5]
haveempschool	Can you verify your employer or school (if attending)? [**Answers:** No=2; Yes=1]
high_school	Did you complete your high school diploma or GED? [**Answers:** No=2; Yes=1]
highgrade	What was your final grade completed in school? [TextBox])
job	Do you have a job? [**Answers:** No=2; Yes=1]
job_last_year	How much have you worked or been enrolled in school in the last 12 months? [**Answers:** 12 Months Full-time=1; 12 Months Part-time=2; 6+ Months Full-time=3; 0 to 6 Months PT/FT=4]
need_training	Right now, do you feel you need more training in a new job or career skill? [**Answers:** No=1; Yes=2]
skill	Do you currently have a skill, trade or profession at which you usually find work? [**Answers:** No=2; Yes=1]
wages_above_min	How hard is it for you to find a job ABOVE minimum wage compared to others? [**Answers:** Easier=1; Same=2; Harder=3; Much Harder=4]

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Voced Problems Distribution Plots

Figure 3.13 shows a set of distribution plots of the Voced Problems Scale. The plots compare the Voced Problems Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie along the diagonal reference line, indicating the Voced Problems Scale distributions in the WIDOC sample are similar to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.13 indicate that the Voced Problems Scale distributions in the WIDOC Sample and Core Composite Norm Group have similar shapes. The box plots (c) in Figure 3.13 indicate that men in the WIDOC sample have slightly higher median scores and more spread and less skew in their scale score distribution in comparison with men in the norm group. The Core Composite Norm Group distributions are somewhat more skewed compared with the WIDOC distributions.

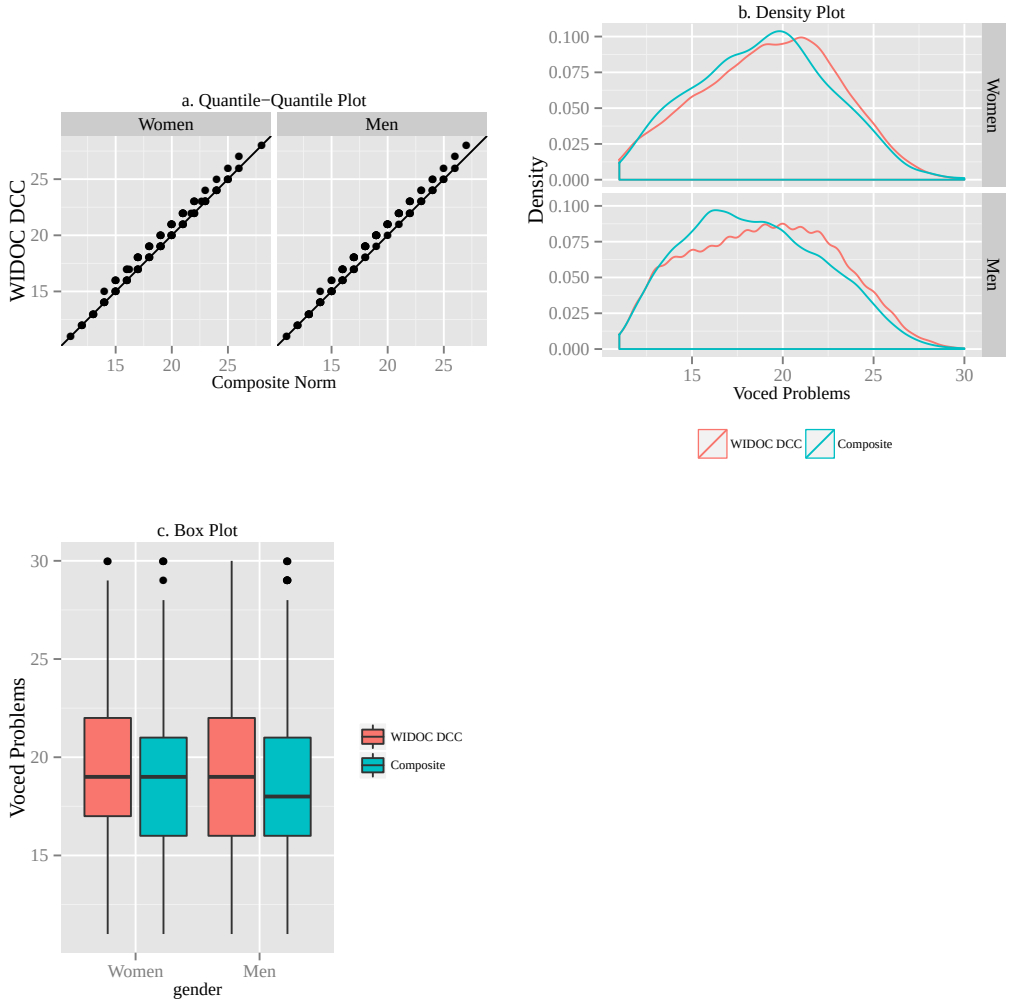

Figure 3.13: Distribution Plots of the Voced Problems Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Voced Problems Scale Deciles Comparison

Table 3.18 compares the Voced Problems Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Voced Problems Scale, the decile cutting points for determining low, medium, and high scores are located at the 6th decile (60th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Voced Problems Scale score of 22 would be located at D8 and scored Highly Probable. A scale score of 22 is located at D8 for men in the WIDOC DCC sample and would be scored Highly Probable if the agency data were used as the reference for making the cuts.

Table 3.18: Voced Problems Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	14	15	17	18	19	20	21	22	24	30
Women DCC	14	16	17	18	19	21	21	23	24	30
Men Composite	14	15	16	17	18	19	20	22	24	30
Men DCC	14	15	17	18	19	20	21	23	24	30

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3.2.9 Family Crime Scale

Table 3.19: Family Criminality

Item	Information
conv_father	Was your father (or father figure who principally raised you) ever arrested, that you know of? [**Answers:** No=1; Yes=2]
conv_mother	Was your mother (or mother figure who principally raised you) ever arrested, that you know of? [**Answers:** No=1; Yes=2]
conv_partner	Was your wife/husband/partner ever arrested, that you know of? [**Answers:** No=1; Yes=2]
conv_siblings	Were your brothers or sisters ever arrested, that you know of? [**Answers:** No=1; Yes=2]
parent_drug_problem	Did a parent or parent figure who raised you ever have a drug or alcohol problem? [**Answers:** No=1; Yes=2]
parent_jailed	Was one of your parents (or parent figure who raised you) ever sent to jail or prison? [**Answers:** No=1; Yes=2]

Family Crime Distribution Plots

Figure 3.14 shows a set of distribution plots of the Family Crime Scale. The plots compare the Family Crime Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie slightly above the diagonal reference line, indicating the Family Crime Scale distributions in the WIDOC sample are similar to the distributions in the Core Composite Norm Group. The density plots (b) in Figure 3.14 indicate that the Family Crime Scale distributions in the WIDOC Sample and Core Composite Norm Group have similar shapes. The box plots (c) in Figure 3.14 indicate the median score of women in the WIDOC sample is higher than the median score of women in the norm group. The median scores of men are the same in the WIDOC sample and norm group. The distributions of women and men in the WIDOC sample have more spread and more skew in comparison to their counterparts in the norm group. The distributions of women and men in the WIDOC sample are skewed in opposite directions.

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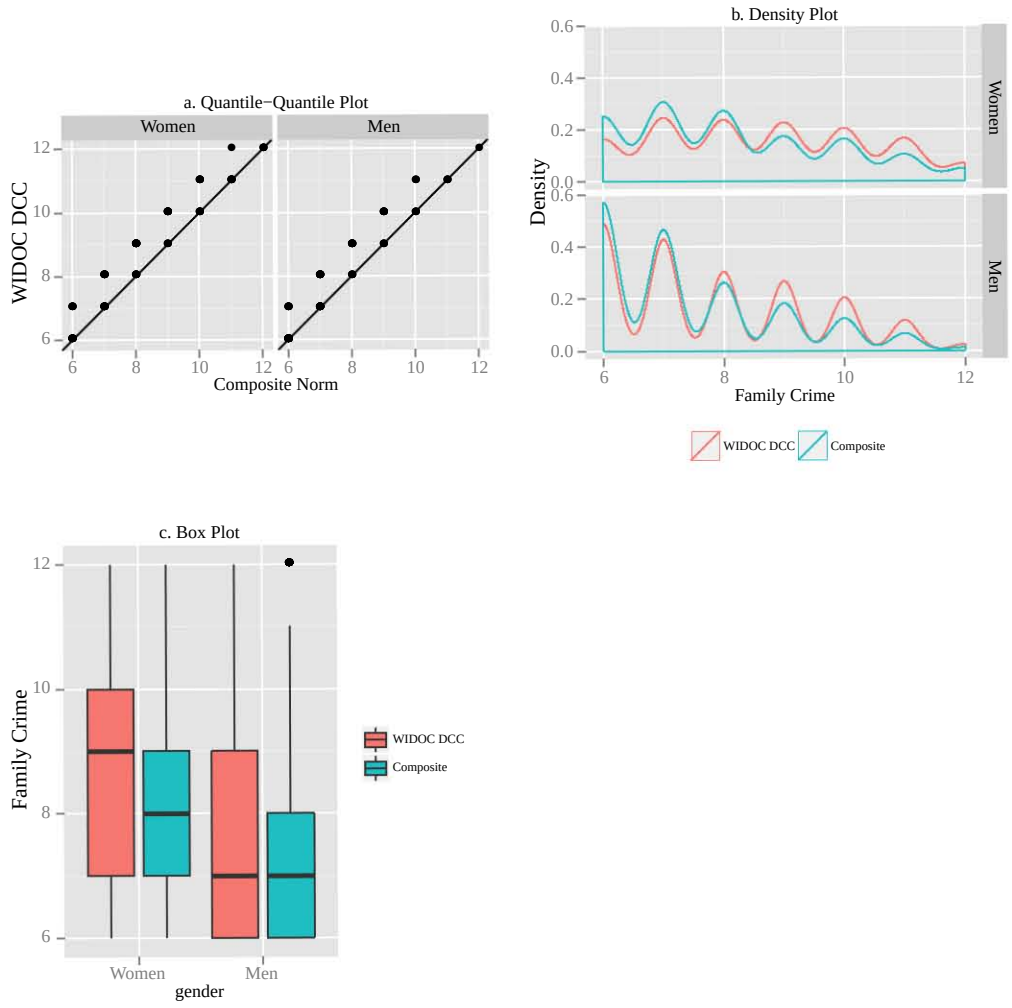

Figure 3.14: Distribution Plots of the Family Crime Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Family Crime Scale Deciles Comparison

Table 3.20 compares the Family Crime Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Family Crime Scale, the decile cutting points for determining low, medium, and high scores are located at the 6th decile (60th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Family Crime Scale score of 9 would be located at D8 and scored Highly Probable. A scale score of 9 is located at D7 for men in the WIDOC DCC sample and would be scored Probable if the agency data were used as the reference for making the cuts.

Table 3.20: Family Crime Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	6	7	7	7	8	8	9	10	11	12
Women DCC	6	7	7	8	9	9	10	10	11	12
Men Composite	6	6	6	7	7	7	8	9	10	12
Men DCC	6	6	7	7	7	8	9	9	10	12

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3.2.10 Social Environment Scale

Table 3.21: Social Environment

Item	Information
citizens_weapons	Do some of the people in your neighborhood feel they need to carry a weapon for protection? [**Answers:** No=1; Yes=2]
fam_victims	In your neighborhood, have some of your friends or family been crime victims? [**Answers:** No=1; Yes=2]
friends_weapons	Do some of your friends or family feel they must carry a weapon to protect themselves in your neighborhood? [**Answers:** No=1; Yes=2]
local_crime	Is there much crime in your neighborhood? [**Answers:** No=1; Yes=2]
local_drugs	Is it easy to get drugs in your neighborhood? [**Answers:** No=1; Yes=2]
local_gangs	Are there gangs in your neighborhood? [**Answers:** No=1; Yes=2]

Social Environment Distribution Plots

Figure 3.15 shows a set of distribution plots of the Social Environment Scale. The plots compare the Social Environment Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie slightly below the diagonal reference line, indicating the Social Environment Scale distributions in the WIDOC sample are similar to the distributions in the default Core Composite Norm Group. The scale scores are coarse and very skewed, making it difficult to interpret the quantile-quantile plot. The alignment of the distributions is easier to see in the deciles table (see Table 3.22). The density plots (b) in Figure 3.15 indicate that the Social Environment Scale distributions in the WIDOC Sample and Core Composite Norm Group have similar shapes. The distributions in the WIDOC sample have higher concentrations of scale scores near zero. The box plots (c) in Figure 3.15 indicate similar median scores for men and women in the WIDOC sample and Core Composite Norm Group. The distributions in the two groups are skewed to the right.

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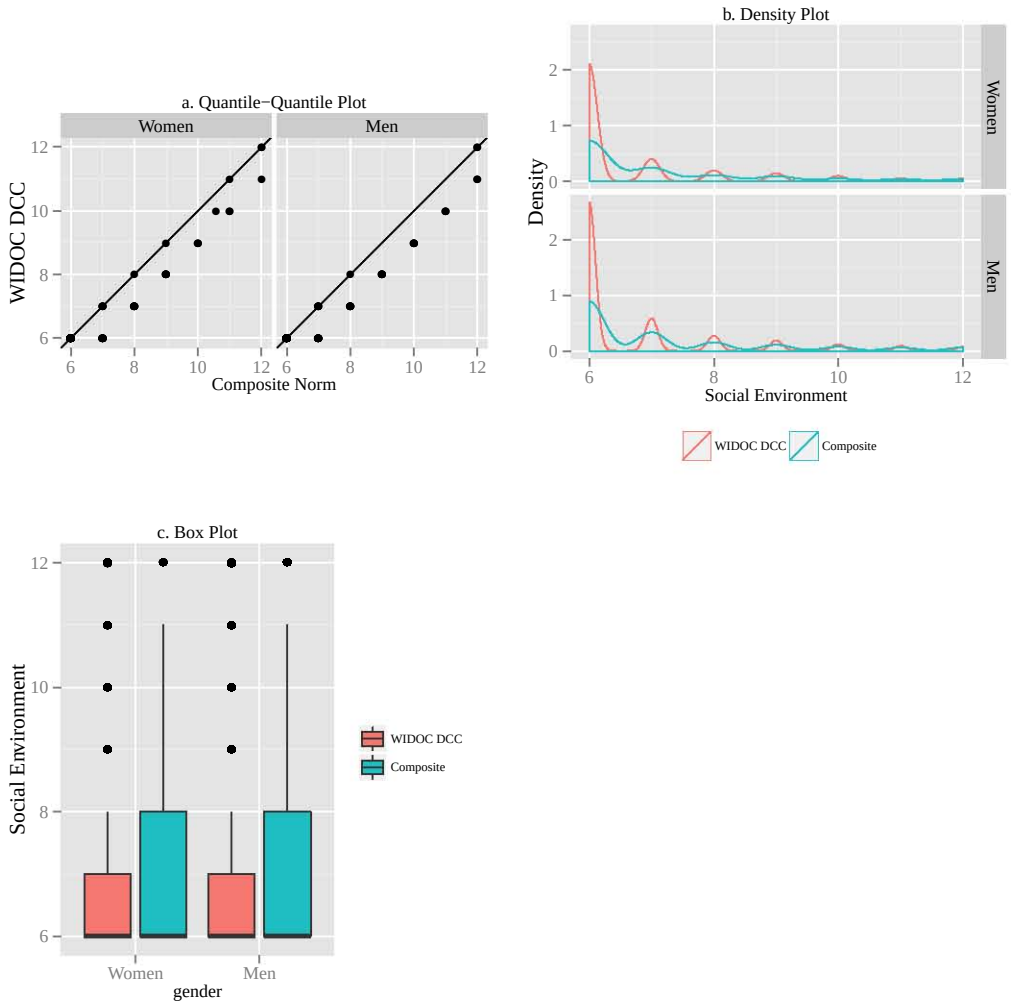

Figure 3.15: Distribution Plots of the Social Environment Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Social Environment Scale Deciles Comparison

Table 3.22 compares the Social Environment Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Social Environment Scale, the decile cutting points for determining low, medium, and high scores are located at the 6th decile (60th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Social Environment Scale score of 8 would be located at D8 and scored Highly Probable. A scale score of 8 is located at D9 for men in the WIDOC DCC sample and would be scored Highly Probable if the agency data were used as the reference for making the cuts.

Table 3.22: Social Environment Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	6	6	6	6	6	7	7	8	10	12
Women DCC	6	6	6	6	6	6	7	7	9	12
Men Composite	6	6	6	6	6	7	7	8	10	12
Men DCC	6	6	6	6	6	6	7	7	9	12

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3.2.11 Leisure Scale

Table 3.23: Leisure and Recreation

Item	Information
bored	How often did you feel bored? [**Answers:** Never=1; Several times/mo=2; Several times/wk=3; Daily=4]
do_boring_or_dull	Do you feel that the things you do are boring or dull? [**Answers:** No=1; Yes=3; Unsure=2]
nothing	How often did you feel you have nothing to do in your spare time? [**Answers:** Never=1; Several times/mo=2; Several times/wk=3; Daily=4]
restless	Do you often become bored with your usual activities? [**Answers:** No=1; Yes=3; Unsure=2]
scattered	Is it difficult for you to keep your mind on one thing for a long time? [**Answers:** No=1; Yes=3; Unsure=2]

Leisure Distribution Plots

Figure 3.16 shows a set of distribution plots of the Leisure Scale. The plots compare the Leisure Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie along the diagonal reference line, indicating the Leisure Scale distributions in the WIDOC DCC Sample are similar to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.16 indicate that the Leisure Scale distributions in the WIDOC DCC Sample and Core Composite Norm Group have similar shapes. The box plots (c) in Figure 3.16 indicate a higher median and less spread but similar skew in the distribution of the Leisure Scale for women in the WIDOC sample in comparison to women in the Core Composite Norm Group. The median is the same for men in the WIDOC sample and the norm group. The men's distributions have similar spread and skew.

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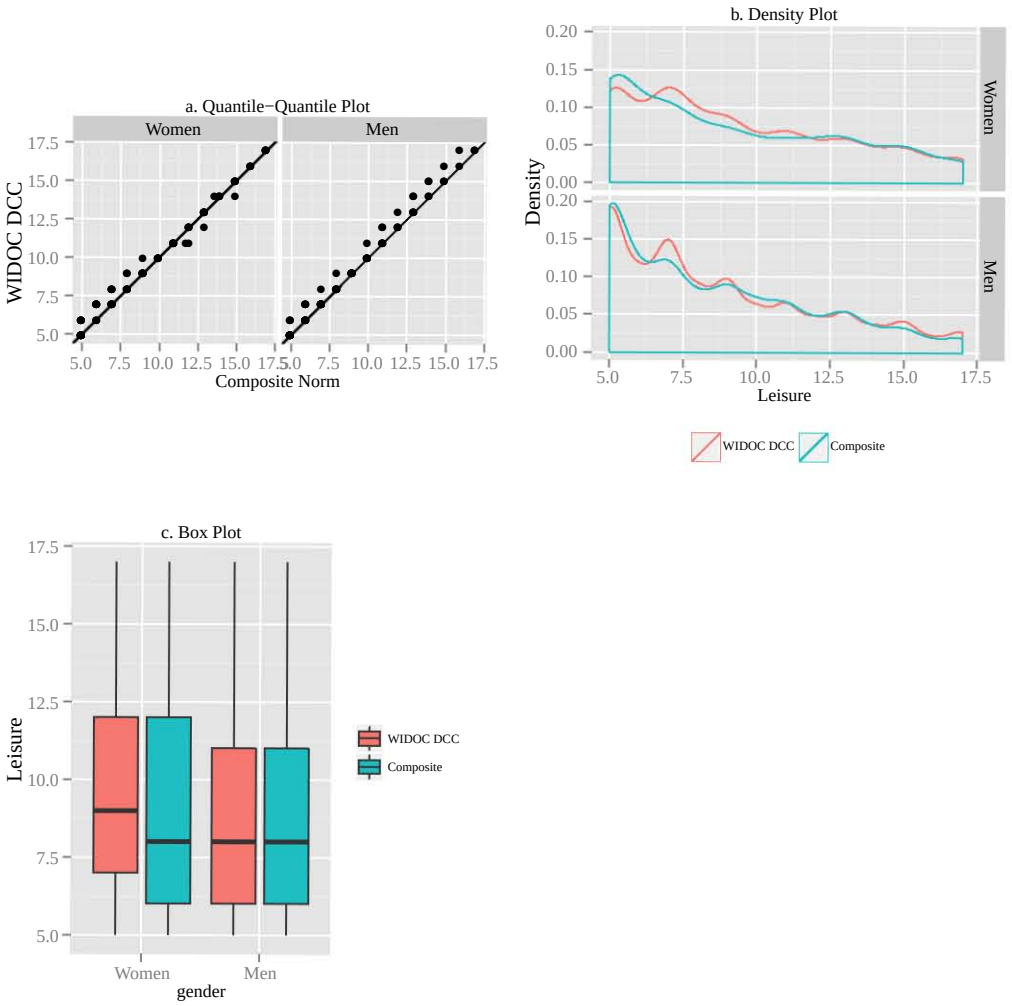

Figure 3.16: Distribution Plots of the Leisure Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Leisure Scale Deciles Comparison

Table 3.24 compares the Leisure Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Leisure Scale, the decile cutting points for determining low, medium, and high scores are located at the 6th decile (60th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Leisure Scale score of 12 would be located at D8 and scored Highly Probable. A scale score of 12 is located at D8 for men in the WIDOC DCC sample and would be scored Highly Probable if the agency data were used as the reference for making the cuts.

Table 3.24: Leisure Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	5	5	6	7	8	10	11	13	15	17
Women DCC	5	6	7	8	9	10	11	13	15	17
Men Composite	5	5	6	7	8	9	10	12	14	17
Men DCC	5	5	6	7	8	9	10	12	14	17

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3.2.12 Residential Instability Scale

Table 3.25: Residential Instability

Item	Information
fam_freq	How often do you have contact with your family (may be in person, phone, mail)? [**Answers:** No family=5; Never=4; Less than once/month=3; Once per week=2; Daily=1]
has_address	Can you provide a verifiable residential address? [**Answers:** No=2; Yes=1]
l_alone	Do you live alone? [**Answers:** No=1; Yes=2]
l_drift	Do you have a regular living situation (an address where you usually stay and can be reached)? [**Answers:** No=2; Yes=1]
l_fam	Do you live with familyâĂŤnatural parents, primary person who raised you, blood relative, spouse, children, or boy/girl friend if living together for more than 1 year? [**Answers:** No=2; Yes=1]
l_friends	Do you live with friends? [**Answers:** No=1; Yes=2]
mnth_local	How long have you been living in that community or neighborhood? [**Answers:** 0-2 mo.=4; 3-5 mo.=3; 6-11 mo.=2; 1+ yrs.=1]
res_moves	How often have you moved in the last twelve months? [**Answers:** Never=0; 1=1; 2=2; 3=3; 4=4; 5+=5]
res_phone	Is there a telephone at this residence (a cell phone is an appropriate alternative)? [**Answers:** No=2; Yes=1]
yrs_address	How long have you been living at your current address? [**Answers:** 0-5 mo.=5; 6-11 mo.=4; 1-3 yrs.=3; 4-5 yrs.=2; 6+ yrs.=1]

Residential Instability Distribution Plots

Figure 3.17 shows a set of distribution plots of the Residential Instability Scale. The plots compare the Residential Instability Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie slightly above the diagonal reference line, indicating the Residential Instability Scale distributions in the WIDOC DCC Sample are similar to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.17 indicate that the Residential Instability Scale distributions in

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the WIDOC DCC Sample and Core Composite Norm Group have similar shapes. The box plots (c) in Figure 3.17 indicate that men and women in the WIDOC sample have slightly higher median scores in comparison to men and women in the norm group. The distributions of women and men in the WIDOC sample have similar skew and spread as the distributions of women and men in the norm group.

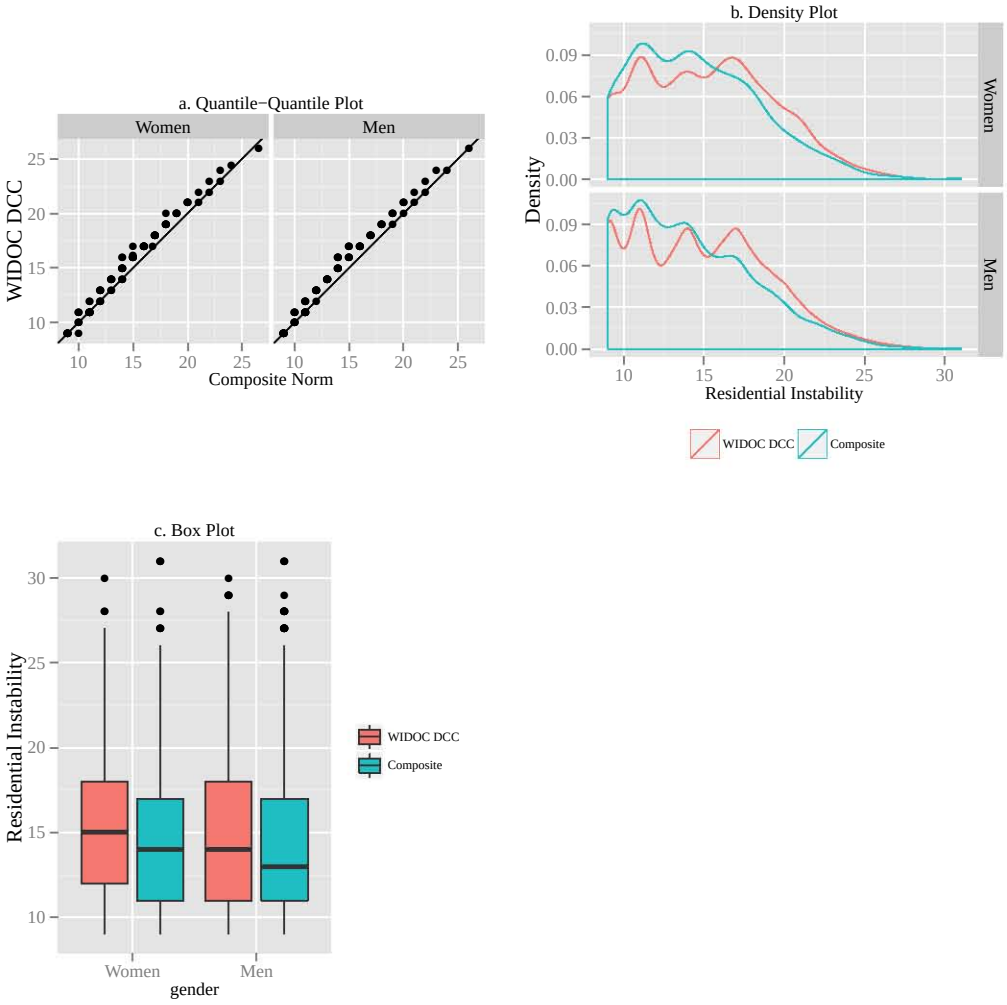

Figure 3.17: Distribution Plots of the Residential Instability Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Residential Instability Scale Deciles Comparison

Table 3.26 compares the Residential Instability Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Residential Instability Scale, the decile cutting points for determining low, medium, and high scores are located at the 6th decile (60th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Residential Instability Scale score of 17 would be located at D8 and scored Highly Probable. A scale score of 17 is located at D7 for men in the WIDOC DCC sample and would be scored Probable if the agency data were used as the reference for making the cuts.

Table 3.26: Residential Instability Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	10	11	12	13	14	15	17	18	20	31
Women DCC	10	11	13	14	15	16	17	19	21	30
Men Composite	9	10	11	12	13	15	16	17	20	31
Men DCC	9	11	12	13	14	16	17	19	20	30

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3.2.13 Social Adjustment Scale

Table 3.27: Social Adjustment Problems

Item	Information
conflict_w_teacher	How often did you have conflicts with teachers at school? [**Answers:** Never=0; Sometimes=1; Often=3]
curr_domviol	Do any current offenses involve family violence? [**Answers:** No=1; Yes=2]
dead_beat	Has anyone accused you of not paying child support? [**Answers:** No=1; Yes=2]
domviol	How many prior family violence offense arrests as an adult? [**Answers:** 0=0; 1=1; 2=2; 3+=3]
expelled	Were you ever suspended or expelled from school? [**Answers:** No=1; Yes=2]
fail_or_repeat_grd	Did you fail or repeat a grade level? [**Answers:** No=1; Yes=2]
fam_conflicts	How often do you have conflicts with friends/family over money? [**Answers:** Often=3; Sometimes=2; Never=1]
fired	Have you ever been fired from a job? [**Answers:** No=1; Yes=2]
firedtimes	About how many times have you been fired from a job? [TextBox])
get_by	How often do you have barely enough money to get by? [**Answers:** Often=3; Sometimes=2; Never=1]
grades_hs	What were your usual grades in high school? [**Answers:** A=1; B=2; C=3; D=4; E/F=5; Did Not Attend=5]
high_school	Did you complete your high school diploma or GED? [**Answers:** No=2; Yes=1]
job	Do you have a job? [**Answers:** No=2; Yes=1]
need_training	Right now, do you feel you need more training in a new job or career skill? [**Answers:** No=1; Yes=2]
pay_bills	How often do you have trouble paying bills? [**Answers:** Often=3; Sometimes=2; Never=1]
res_moves	How often have you moved in the last twelve months? [**Answers:** Never=0; 1=1; 2=2; 3=3; 4=4; 5+=5]

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Social Adjustment Distribution Plots

Figure 3.18 shows a set of distribution plots of the Social Adjustment Scale. The plots compare the Social Adjustment Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie slightly above the diagonal reference line, indicating the Social Adjustment Scale distributions in the WIDOC DCC Sample are similar to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.18 indicate that the Social Adjustment Scale distributions in the WIDOC DCC Sample and Core Composite Norm Group have similar shapes. The box plots (c) in Figure 3.18 indicate that men and women in the WIDOC sample have slightly higher median scores in comparison to men and women in the norm group. The distributions of women and men in the WIDOC sample have similar skew and spread as the distributions of women and men in the norm group.

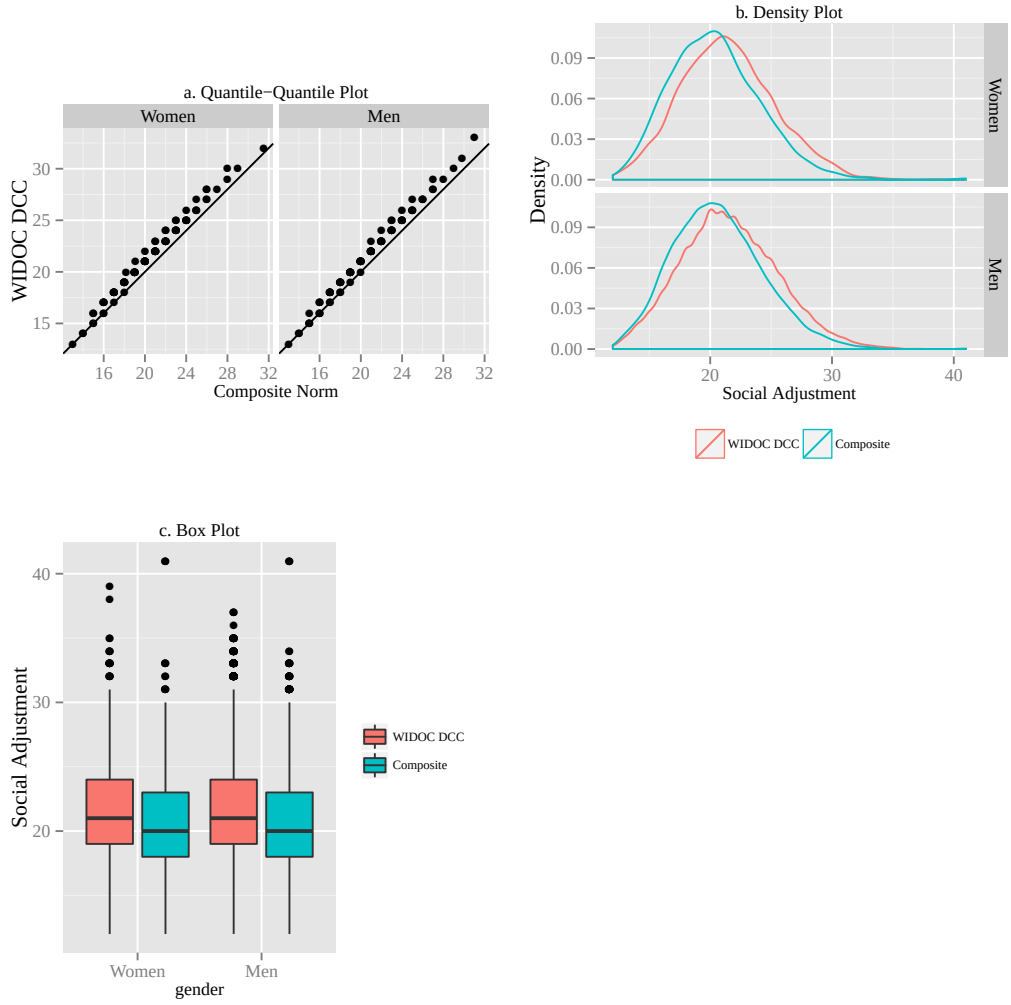

Figure 3.18: Distribution Plots of the Social Adjustment Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Social Adjustment Scale Deciles Comparison

Table 3.28 compares the Social Adjustment Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Social Adjustment Scale, the decile cutting points for determining low, medium, and high scores are located at the 6th decile (60th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Social Adjustment Scale score of 24 would be located at D8 and scored Highly Probable. A scale score of 24 is located at D7 for men in the WIDOC DCC sample and would be scored Probable if the agency data were used as the reference for making the cuts.

Table 3.28: Social Adjustment Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	16	17	18	19	20	21	22	23	25	41
Women DCC	17	18	19	20	21	22	23	25	27	39
Men Composite	16	17	19	19	20	21	22	24	26	41
Men DCC	17	18	19	20	21	22	24	25	27	37

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3.2.14 Socialization Failure Scale

Table 3.29: Socialization Failure

Item	Information
conflict_w_teacher	How often did you have conflicts with teachers at school? [**Answers:** Never=0; Sometimes=1; Often=3]
conv_father	Was your father (or father figure who principally raised you) ever arrested, that you know of? [**Answers:** No=1; Yes=2]
conv_mother	Was your mother (or mother figure who principally raised you) ever arrested, that you know of? [**Answers:** No=1; Yes=2]
expelled	Were you ever suspended or expelled from school? [**Answers:** No=1; Yes=2]
fail_or_repeat_grd	Did you fail or repeat a grade level? [**Answers:** No=1; Yes=2]
fights_at_school	How often did you get in fights while at school? [**Answers:** Never=0; Sometimes=1; Often=3]
high_school	Did you complete your high school diploma or GED? [**Answers:** No=2; Yes=1]
juv_placement	How many prior commitments to a juvenile institution? [**Answers:** 0=0; 1=1; 2+=2]
juv_vfelony	How many prior juvenile violent felony offense arrests? [**Answers:** 0=0; 1=1; 2+=2]
n_juv_felony	How many prior juvenile felony offense arrests? [**Answers:** 0=0; 1=1; 2=2; 3=3; 4=4; 5+=5]
parent_drug_problem	Did a parent or parent figure who raised you ever have a drug or alcohol problem? [**Answers:** No=1; Yes=2]
parent_jailed	Was one of your parents (or parent figure who raised you) ever sent to jail or prison? [**Answers:** No=1; Yes=2]
skipped_classes	How many times did you skip classes while in school? [**Answers:** Never=0; Sometimes=1; Often=3]

Socialization Failure Distribution Plots

Figure 3.19 shows a set of distribution plots of the Socialization Failure Scale. The plots compare the Socialization Failure Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie slightly below the diagonal reference line, indicating the Socialization Failure Scale distributions in the WIDOC

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DCC Sample are similar to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.19 indicate that the Socialization Failure Scale distributions in the WIDOC DCC Sample and Core Composite Norm Group have similar shapes. The mass of the WIDOC distributions is shifted somewhat more to the left in comparison to the norm group distributions. The box plots (c) in Figure 3.19 indicate that men and women in the WIDOC sample have slightly lower median scores in comparison to men and women in the norm group. The distributions of women and men in the WIDOC sample have similar skew and spread as the distributions of women and men in the norm group.

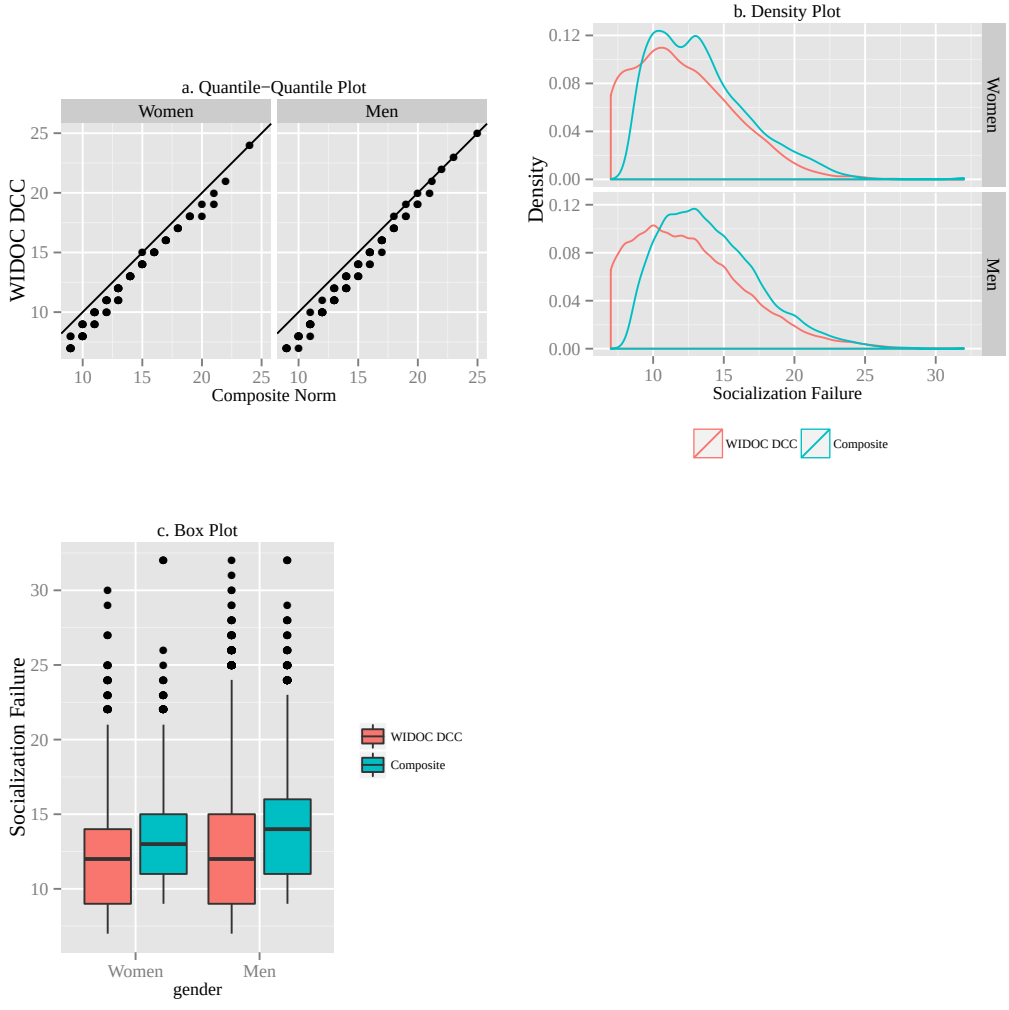

Figure 3.19: Distribution Plots of the Socialization Failure Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Socialization Failure Scale Deciles Comparison

Table 3.30 compares the Socialization Failure Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Socialization Failure Scale, the decile cutting points for determining low, medium, and high scores are located at the 6th decile (60th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Socialization Failure Scale score of 17 would be located at D8 and scored Highly Probable. A scale score of 17 is located at D9 for men in the WIDOC DCC sample and would be scored Highly Probable if the agency data were used as the reference for making the cuts.

Table 3.30: Socialization Failure Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	10	10	11	12	13	14	15	16	18	32
Women DCC	8	9	10	11	12	13	14	15	17	30
Men Composite	10	11	12	13	14	15	16	17	19	32
Men DCC	8	9	10	11	12	13	14	16	18	32

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3.2.15 Criminal Opportunity Scale

Table 3.31: Criminal Opportunity

Item	Information
agegroup	Which age group does the person fall into? [**Answers:** 16-21=0; 22-30=1; 31-40=2; 41+=3]
citizens_weapons	Do some of the people in your neighborhood feel they need to carry a weapon for protection? [**Answers:** No=1; Yes=2]
friends_drugs	How many of your friends/acquaintances are taking illegal drugs regularly (more than a couple times a month)? [**Answers:** None=1; Few=2; Half=3; Most=4]
haveempschool	Can you verify your employer or school (if attending)? [**Answers:** No=2; Yes=1]
job	Do you have a job? [**Answers:** No=2; Yes=1]
job_last_year	How much have you worked or been enrolled in school in the last 12 months? [**Answers:** 12 Months Full-time=1; 12 Months Part-time=2; 6+ Months Full-time=3; 0 to 6 Months PT/FT=4]
l_drift	Do you have a regular living situation (an address where you usually stay and can be reached)? [**Answers:** No=2; Yes=1]
local_crime	Is there much crime in your neighborhood? [**Answers:** No=1; Yes=2]
local_gangs	Are there gangs in your neighborhood? [**Answers:** No=1; Yes=2]
need_training	Right now, do you feel you need more training in a new job or career skill? [**Answers:** No=1; Yes=2]
nothing	How often did you feel you have nothing to do in your spare time? [**Answers:** Never=1; Several times/mo=2; Several times/wk=3; Daily=4]
res_moves	How often have you moved in the last twelve months? [**Answers:** Never=0; 1=1; 2=2; 3=3; 4=4; 5+=5]
res_phone	Is there a telephone at this residence (a cell phone is an appropriate alternative)? [**Answers:** No=2; Yes=1]
restless	Do you often become bored with your usual activities? [**Answers:** No=1; Yes=3; Unsure=2]

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Criminal Opportunity Distribution Plots

Figure 3.20 shows a set of distribution plots of the Criminal Opportunity Scale. The plots compare the Criminal Opportunity Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie along the diagonal reference line, indicating the Criminal Opportunity Scale distributions in the WIDOC DCC Sample are similar to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.20 indicate that the Criminal Opportunity Scale distributions in the WIDOC DCC Sample and Core Composite Norm Group have similar shapes. The box plots (c) in Figure 3.20 indicate that men and women in the WIDOC sample have slightly higher median scores in comparison with men and women in the norm group. The distributions of women and men in the WIDOC sample exhibit similar skew and spread as the distributions of women and men in the norm group.

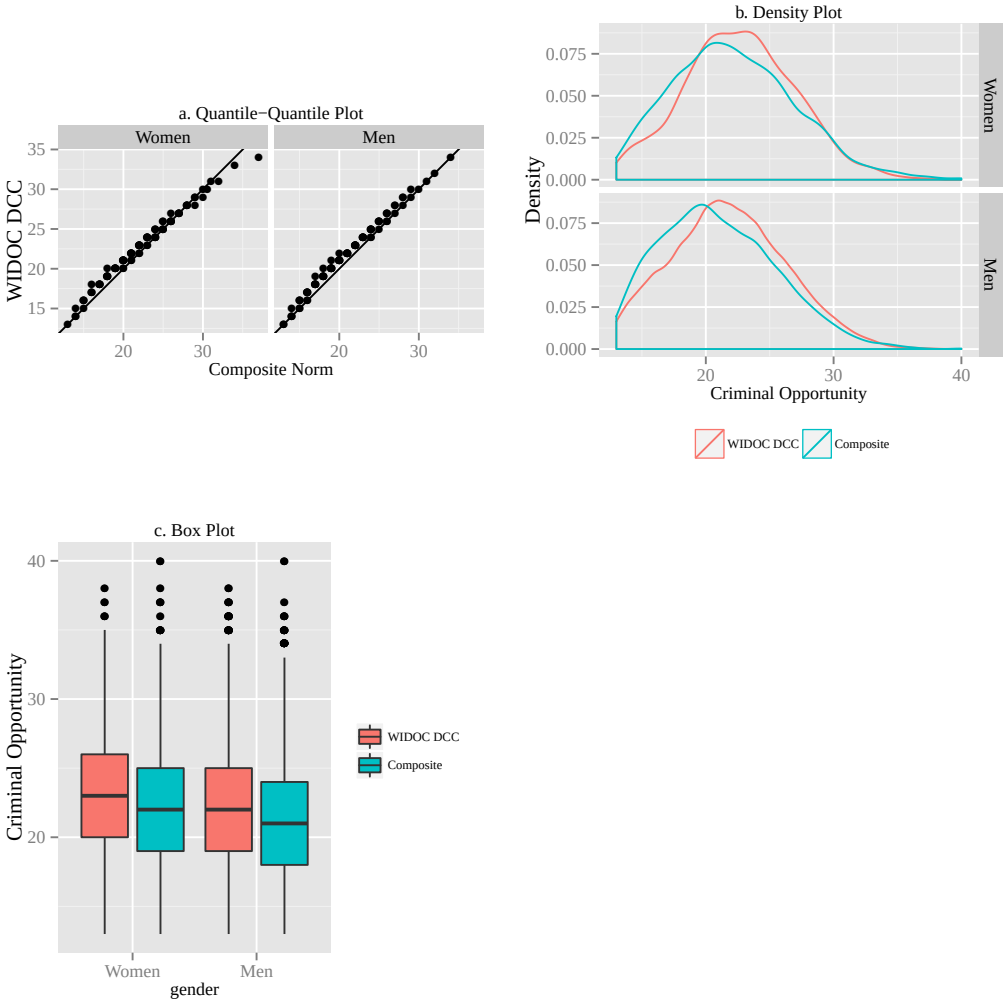

Figure 3.20: Distribution Plots of the Criminal Opportunity Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Criminal Opportunity Scale Deciles Comparison

Table 3.32 compares the Criminal Opportunity Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Criminal Opportunity Scale, the decile cutting points for determining low, medium, and high scores are located at the 6th decile (60th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Criminal Opportunity Scale score of 25 would be located at D8 and scored Highly Probable. A scale score of 25 is located at D8 for men in the WIDOC DCC sample and would be scored Highly Probable if the agency data were used as the reference for making the cuts.

Table 3.32: Criminal Opportunity Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	16	18	19	21	22	23	25	26	29	40
Women DCC	17	19	20	21	23	24	25	26	28	38
Men Composite	15	17	18	19	21	22	23	25	27	40
Men DCC	16	18	19	21	22	23	24	26	28	38

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3.2.16 Social Isolation Scale

Table 3.33: Social Isolation

Item	Information
best_friend	"I have a best friend I can talk with about everything." [**Answers:** Strongly Disagree=5; Disagree=4; Not Sure=3; Agree=2; Strongly Agree=1]
close_friends	"I feel very close to some of my friends." [**Answers:** Strongly Disagree=5; Disagree=4; Not Sure=3; Agree=2; Strongly Agree=1]
companion	"I can find companionship when I want." [**Answers:** Strongly Disagree=5; Disagree=4; Not Sure=3; Agree=2; Strongly Agree=1]
friends_enjoy	"I have friends who enjoy doing things with me." [**Answers:** Strongly Disagree=5; Disagree=4; Not Sure=3; Agree=2; Strongly Agree=1]
friends_help	"I have friends who help me when I have troubles." [**Answers:** Strongly Disagree=5; Disagree=4; Not Sure=3; Agree=2; Strongly Agree=1]
left_out	"I often feel left out of things." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
lonely	"I feel lonely." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
noone_knows	"No one really knows me very well." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]

Social Isolation Distribution Plots

Figure 3.21 shows a set of distribution plots of the Social Isolation Scale. The plots compare the Social Isolation Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie along the diagonal reference line, indicating the Social Isolation Scale distributions in the WIDOC DCC Sample are similar to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.21 indicate that the Social Isolation Scale distributions in the WIDOC DCC Sample and Core Composite Norm Group have similar shapes. The distributions in the WIDOC sample have somewhat higher concentrations of scores at the scale midpoint in comparison to the distributions in the norm group. The box plots (c) in Figure 3.21 indicate that men and women in the WIDOC sample have the same median scores and similar spread and skew in their distributions as men and women in the norm group.

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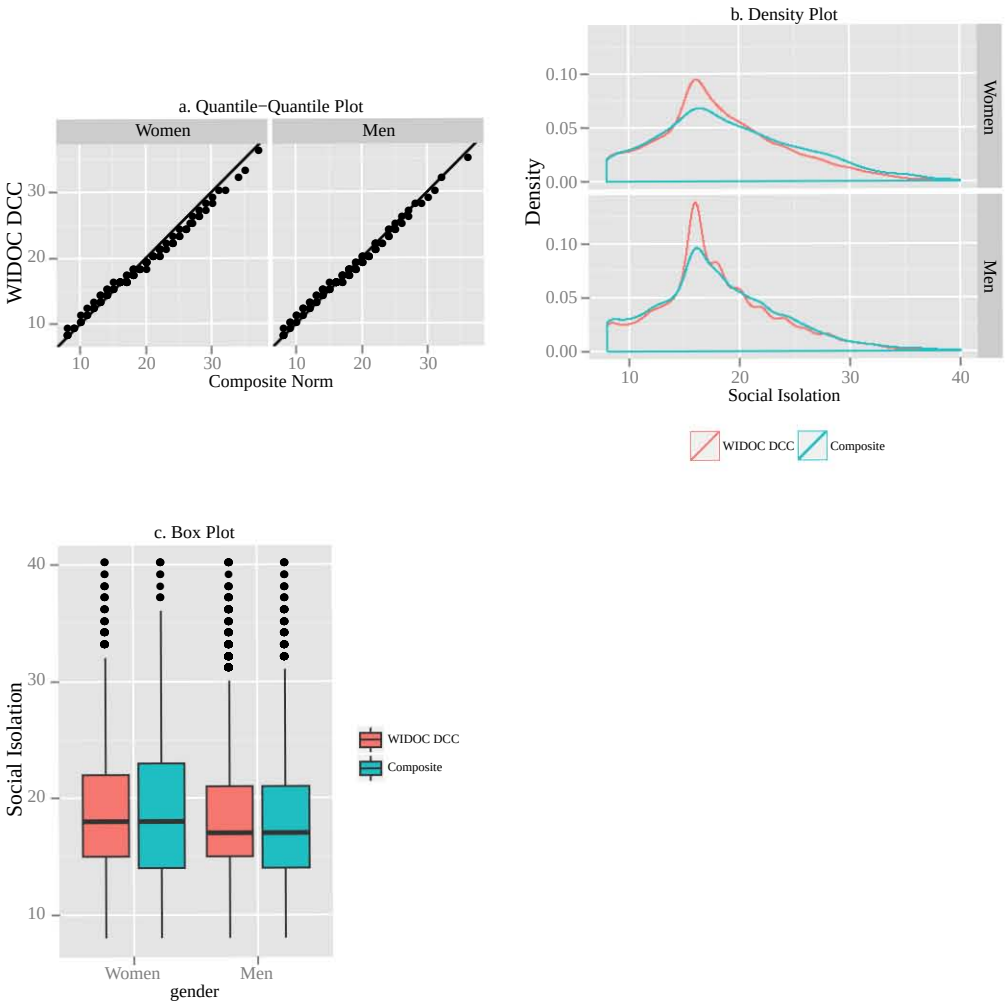

Figure 3.21: Distribution Plots of the Social Isolation Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Social Isolation Scale Deciles Comparison

Table 3.34 compares the Social Isolation Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Social Isolation Scale, the decile cutting points for determining low, medium, and high scores are located at the 6th decile (60th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Social Isolation Scale score of 22 would be located at D8 and scored Highly Probable. A scale score of 22 is located at D8 for men in the WIDOC DCC sample and would be scored Highly Probable if the agency data were used as the reference for making the cuts.

Table 3.34: Social Isolation Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	11	13	16	16	18	20	22	25	28	40
Women DCC	11	14	16	16	18	19	21	23	27	40
Men Composite	11	13	15	16	17	18	20	22	26	40
Men DCC	11	14	16	16	17	18	20	22	25	40

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3.2.17 Criminal Thinking Scale

Table 3.35: Criminal Thinking Self Report

Item	Information
animals	"Some people just don't deserve any respect and should be treated like animals." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
hungry_steal	"A hungry person has a right to steal." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
insults	"If someone insults my friends, family or group they are asking for trouble." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
law_doesnt	"The law doesn't help average people." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
law_nochance	"When people get into trouble with the law it's because they have no chance to get a decent job." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
minor_dont	"When people do minor offenses or use drugs they don't hurt anyone except themselves." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
roughly	"Some people must be treated roughly or beaten up just to send them a clear message." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
stolen_rich	"When things are stolen from rich people they won't miss the stuff because insurance will cover the loss." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
threaten	"I won't hesitate to hit or threaten people if they have done something to hurt my friends or family" [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
trouble_no	"Many people get into trouble or use drugs because society has given them no education, jobs or future." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]

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Criminal Thinking Distribution Plots

Figure 3.22 shows a set of distribution plots of the Criminal Thinking Scale. The plots compare the Criminal Thinking Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie slightly below the diagonal reference line, indicating the Criminal Thinking Scale distributions in the WIDOC DCC Sample are similar to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.22 indicate that the Criminal Thinking Scale distributions in the WIDOC DCC Sample and Core Composite Norm Group have similar shapes. The distributions in the WIDOC sample have somewhat higher concentrations of scores at the scale midpoint in comparison to the distributions in the norm group. The box plots (c) in Figure 3.22 indicate that men and women in the WIDOC sample have slightly lower median scores and similar spread and skew in their distributions as men and women in the norm group.

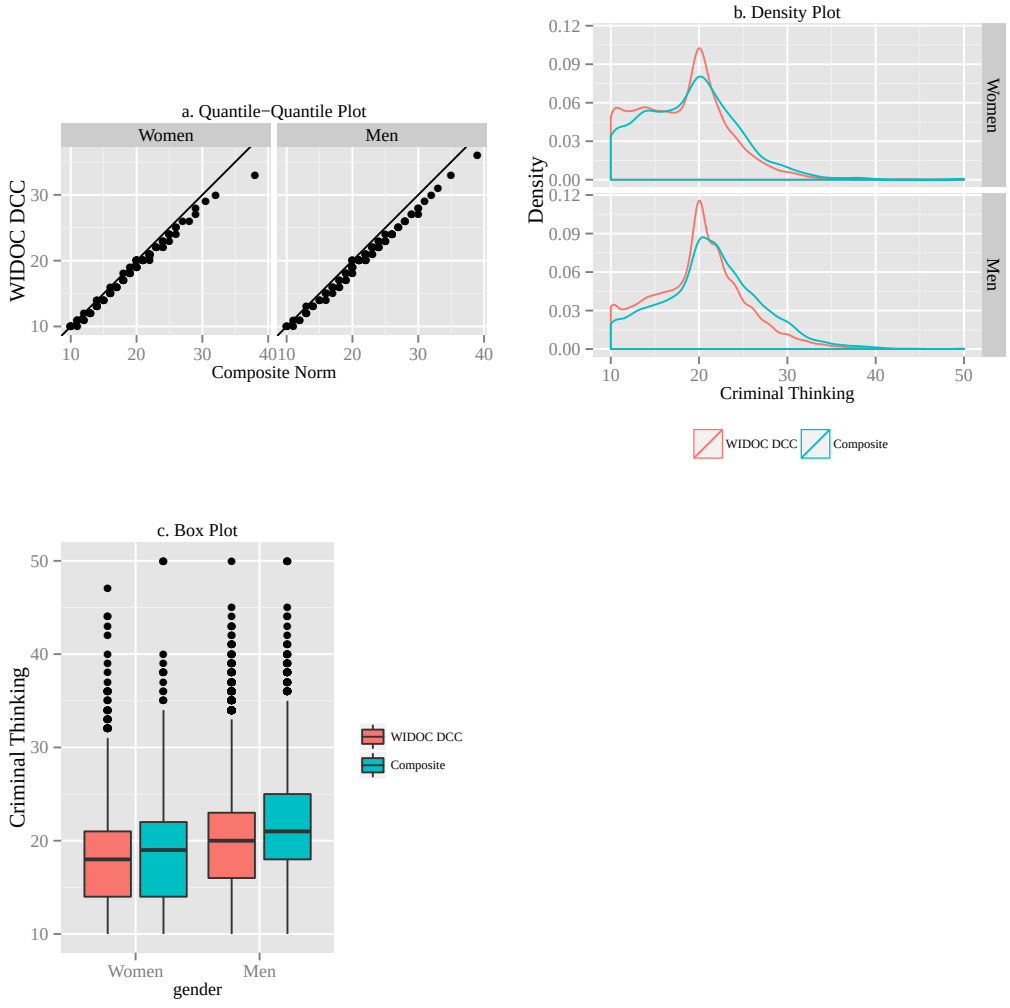

Figure 3.22: Distribution Plots of the Criminal Thinking Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Criminal Thinking Scale Deciles Comparison

Table 3.36 compares the Criminal Thinking Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Criminal Thinking Scale, the decile cutting points for determining low, medium, and high scores are located at the 6th decile (60th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Criminal Thinking Scale score of 26 would be located at D8 and scored Highly Probable. A scale score of 26 is located at D9 for men in the WIDOC DCC sample and would be scored Highly Probable if the agency data were used as the reference for making the cuts.

Table 3.36: Criminal Thinking Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	12	14	16	17	19	20	22	23	26	50
Women DCC	11	13	15	17	18	20	20	22	24	47
Men Composite	13	16	19	20	21	22	24	26	28	50
Men DCC	12	15	17	19	20	21	22	24	26	50

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3.2.18 Criminal Personality Scale

Table 3.37: Criminal Personality

Item	Information
angry_dangerous	"If people make me angry or lose my temper, I can be dangerous." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
break_promise	"I feel bad if I break a promise I have made to someone." [**Answers:** Strongly Disagree=5; Disagree=4; Not Sure=3; Agree=2; Strongly Agree=1]
cold	"I am seen by others as cold and unfeeling." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
getting_close	"The trouble with getting close to people is that they start making demands on you." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
involved_out	"I have gotten involved in things I later wished I could have gotten out of." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
never_temper	"I almost never lose my temper." [**Answers:** Strongly Disagree=5; Disagree=4; Not Sure=3; Agree=2; Strongly Agree=1]
often_bored	How much do you agree or disagree with the following -You are often restless and bored? [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
short_temper	"I have a short temper and can get angry quickly." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
sweet_talk	"I have the ability to "sweet talk" people to get what I want." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
talking_problems	"I'm really good at talking my way out of problems." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
violent_person	"Some people see me as a violent person." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]
without_thinking	"I get into trouble because I do things without thinking." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]

Continued on next page

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Table 3.37 – continued from the previous page

Item	Information
yourself_first	"To get ahead in life you must always put yourself first." [**Answers:** Strongly Disagree=1; Disagree=2; Not Sure=3; Agree=4; Strongly Agree=5]

Criminal Personality Distribution Plots

Figure 3.23 shows a set of distribution plots of the Criminal Personality Scale. The plots compare the Criminal Personality Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie along the diagonal reference line, indicating the Criminal Personality Scale distributions in the WIDOC DCC Sample are similar to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.23 indicate that the Criminal Personality Scale distributions in the WIDOC DCC Sample and Core Composite Norm Group have similar shapes. The box plots (c) in Figure 3.23 indicate that men and women in the WIDOC sample have slightly higher median scores in comparison to men and women in the norm group. The distributions of women and men in the WIDOC sample have similar skew and spread as the distributions of women and men in the norm group.

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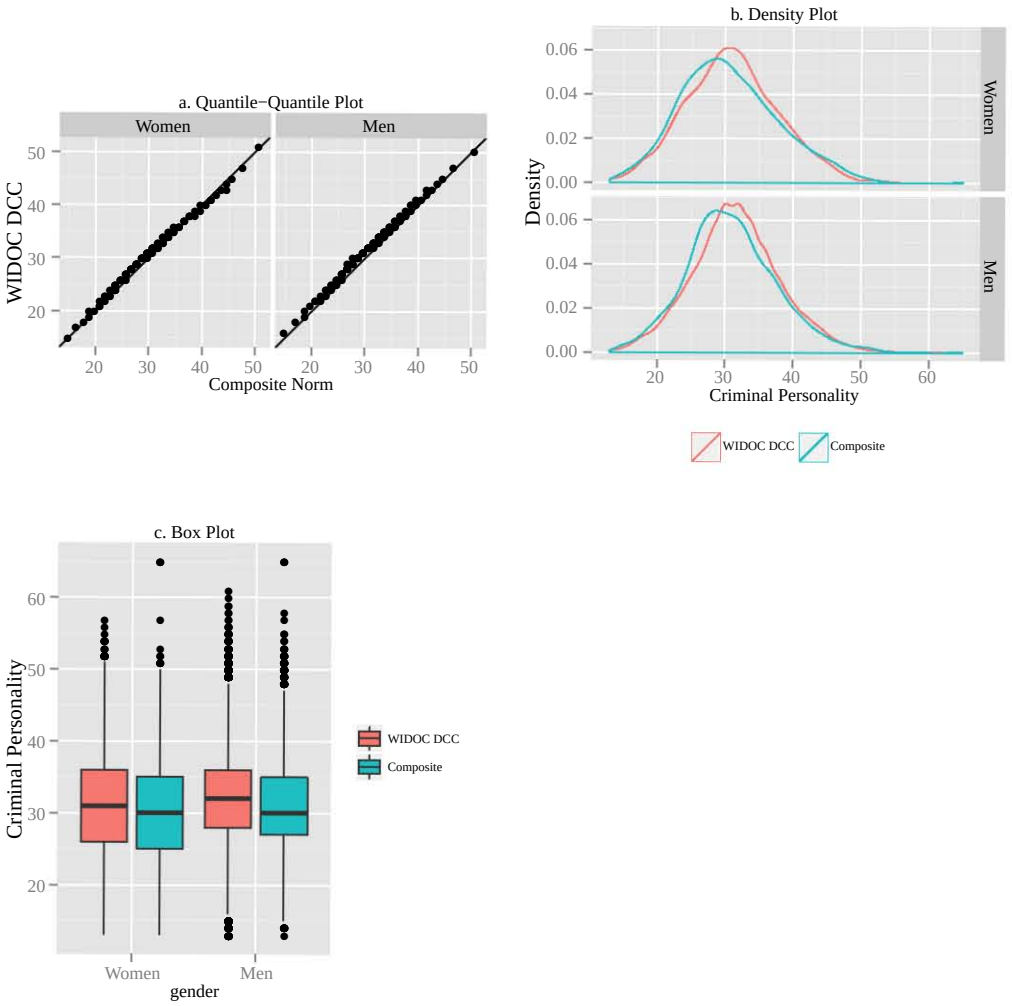

Figure 3.23: Distribution Plots of the Criminal Personality Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Criminal Personality Scale Deciles Comparison

Table 3.38 compares the Criminal Personality Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Criminal Personality Scale, the decile cutting points for determining low, medium, and high scores are located at the 6th decile (60th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Criminal Personality Scale score of 36 would be located at D8 and scored Highly Probable. A scale score of 36 is located at D8 for men in the WIDOC DCC sample and would be scored Highly Probable if the agency data were used as the reference for making the cuts.

Table 3.38: Criminal Personality Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	22	24	26	28	30	32	34	37	41	65
Women DCC	22	25	27	29	31	32	34	37	40	57
Men Composite	23	26	27	29	30	32	34	36	40	65
Men DCC	24	26	28	30	32	33	35	37	40	61

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3.2.19 Violent Recidivism Risk Scale

Table 3.39: Violent Recidivism Risk Scale Items.

Items	Description of Violence-R Risk Scale Inputs
log.hxviol	History of Violence - transformed: ln(hxviol + 1)
hxnonc3	History of Non-Compliance scale - transformed: (hxnonc)/3
voced6	Vocational Educational Problems scale - transformed: (voced)/6
age.l	Person's age at intake - transformed value: ln(age - 14)
logage.1	Person's age at first arrest - transformed value: ln(age.first)

Note. voced6 refers to a transform of the Adult COMPAS version of the Vocational/Educational Problems scale.

The following equation is used to score the Violent Recidivism Risk Scale:

Violent Recidivism Risk Score $= (age.1 * -w) + (logage1s * -w) + (loghxviol * w) + (voced6 * w) + (hxnonc3 * w)$,

where w is a regression weight.

Violent Recidivism Risk Distribution Plots

Figure 3.24 shows a set of distribution plots of the Violent Recidivism Risk Scale. The plots compare the Violent Recidivism Risk Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie slightly below the diagonal reference line, indicating the Violent Recidivism Risk Scale distributions in the WIDOC DCC Sample are shifted lower in comparison to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.24 indicate that the Violent Recidivism Risk Scale distributions in the WIDOC DCC Sample and Core Composite Norm Group have similar shapes. The mass of the WIDOC distributions is shifted somewhat more to the left in comparison to the norm group distributions. The box plots (c) in Figure 3.24 indicate that men and women in the WIDOC sample have lower median scores in comparison to men and women in the norm group. The distributions of women and men in the WIDOC sample have similar skew and spread as the distributions of women and men in the norm group.

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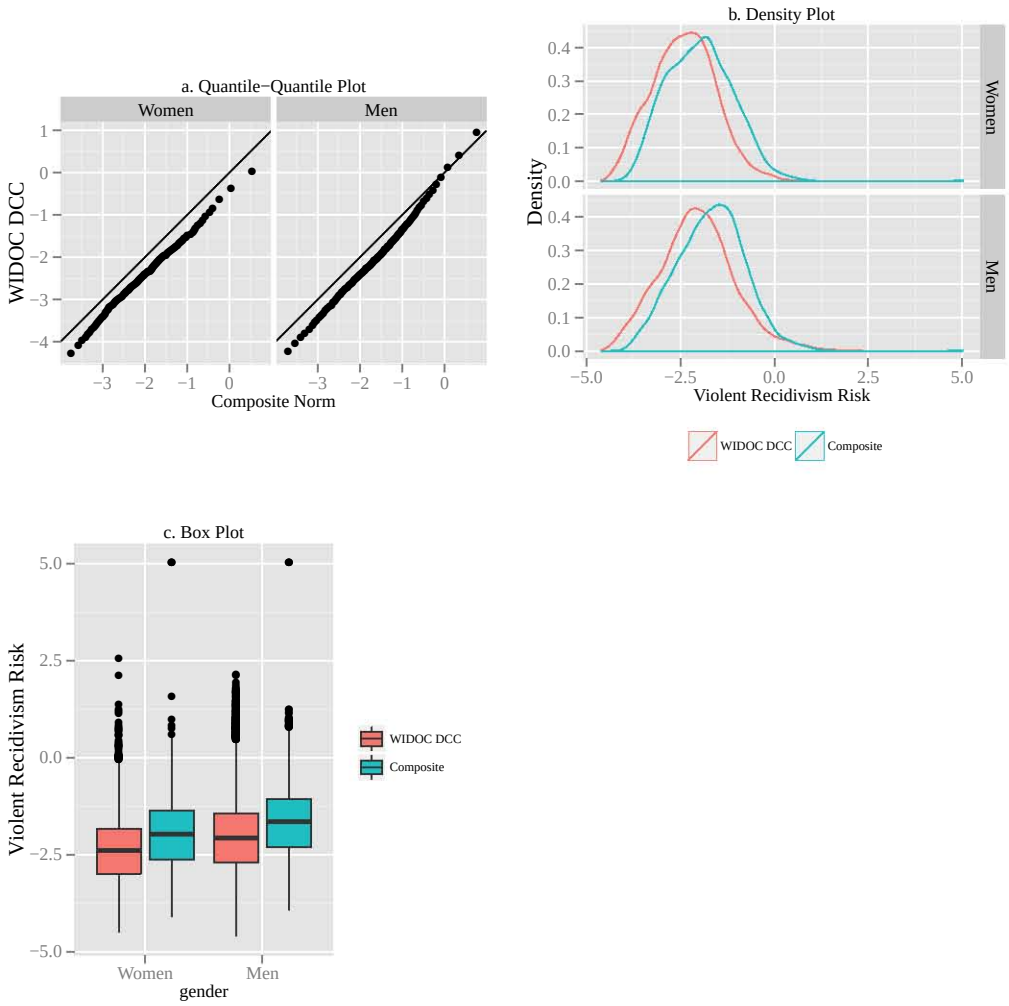

Figure 3.24: Distribution Plots of the Violent Recidivism Risk Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Violent Recidivism Risk Scale Deciles Comparison

Table 3.40 compares the Violent Recidivism Risk Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Violent Recidivism Risk Scale, the decile cutting points for determining low, medium, and high scores are located at the 5th decile (50th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Violent Recidivism Risk Scale score of -0.95 would be located at D8 and scored High. A scale score of -0.95 is located at D9 for men in the WIDOC DCC sample and would be scored High if the agency data were used as the reference for making the cuts.

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Table 3.40: Violent Recidivism Risk Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	−3.11	−2.78	−2.49	−2.22	−1.99	−1.76	−1.52	−1.21	−0.81	5.01
Women DCC	−3.54	−3.14	−2.87	−2.63	−2.40	−2.17	−1.95	−1.70	−1.33	2.54
Men Composite	−2.89	−2.48	−2.15	−1.89	−1.66	−1.43	−1.20	−0.95	−0.58	5.01
Men DCC	−3.34	−2.88	−2.57	−2.31	−2.07	−1.84	−1.59	−1.29	−0.79	2.13

Table 3.41: General Recidivism Risk Scale Items.

Items	Short Description (Response Categories)
logcrimv	Criminal Involvement scale transform: ln(criminv + 1)
voced6	Vocational Educational Problems scale transform: voced/6
drgprob5	Drug problem component transform: drugprob/5
age.l	Offender's age at intake transform: ln(age - 14)
logage.1	Offender's age at first arrest transform: ln(age.first)
logarate	Offender's arrest rate transform: ln(100*arrest.r)

Note. Refer to scale sections for descriptions of response categories.

3.2.20 General Recidivism Risk Scale

The following equation is used to score the Recidivism Risk scale:

General Recidivism Risk $= -K + (w * logcrimv) + (w * voced6) - (w * age.1) - (w * logage1s) + (w * logarate) + (w * drugprob5)$,

where K is the intercept and w is a regression weight.

General Recidivism Risk Distribution Plots

Figure 3.25 shows a set of distribution plots of the General Recidivism Risk Scale. The plots compare the General Recidivism Risk Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie somewhat below the diagonal reference line, indicating the General Recidivism Risk Scale distributions in the WIDOC DCC Sample are shifted lower in comparison to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.25 indicate that the General Recidivism Risk Scale distributions in the WIDOC DCC Sample and Core Composite Norm Group have similar shapes. The mass of the WIDOC distributions is shifted somewhat more to the left in comparison to the norm group distributions. The box plots (c) in Figure 3.25 indicate that men and women in the WIDOC sample have lower median scores in comparison to men and women in the norm group. The distributions of women and men in the WIDOC sample have similar skew and spread as the distributions of women and men in the norm group.

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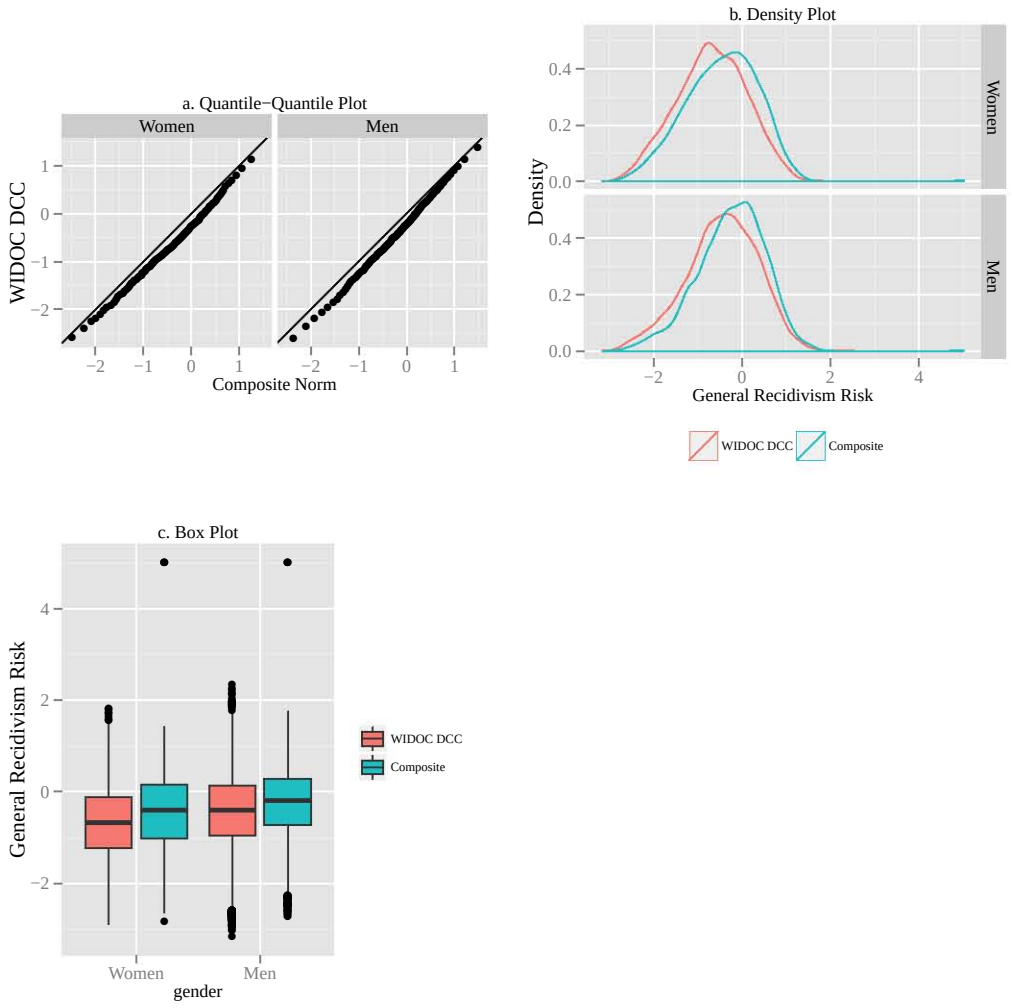

Figure 3.25: Distribution Plots of the General Recidivism Risk Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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General Recidivism Risk Scale Deciles Comparison

Table 3.42 compares the General Recidivism Risk Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the General Recidivism Risk Scale, the decile cutting points for determining low, medium, and high scores are located at the 5th decile (50th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw General Recidivism Risk Scale score of 0.41 would be located at D8 and scored High. A scale score of 0.41 is located at D9 for men in the WIDOC DCC sample and would be scored High if the agency data were used as the reference for making the cuts.

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Table 3.42: General Recidivism Risk Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	−1.55	−1.17	−0.88	−0.62	−0.41	−0.18	0.03	0.26	0.55	5.01
Women DCC	−1.77	−1.38	−1.10	−0.87	−0.68	−0.46	−0.23	0.01	0.34	1.82
Men Composite	−1.25	−0.86	−0.60	−0.38	−0.18	0.01	0.19	0.41	0.68	5.01
Men DCC	−1.54	−1.12	−0.84	−0.62	−0.41	−0.21	0.01	0.26	0.56	2.36

3.2.21 Pretrial Release Risk Scale

Table 3.43: Pretrial Release Risk

Item	Information
n.arrest.on.bail	How many times has this person been arrested/charged with a new crime while on pretrial release (includes current)? [**Answers:** 0=1, 1=2, 2=2, 3+=2]
n.fta	How many times has this person failed to appear for a scheduled criminal court hearing? [**Answers:** 0=0, 1=1, 2=2, 3=3, 4=4, 5+=5]
n.jails	How many times has this person been sentenced to jail for 30 days or more? [**Answers:** 0=0, 1=1, 2=2, 3=3, 4=4, 5+=5]
skill	Do you currently have a skill, trade or profession at which you usually find work? [**Answers:** No=2, Yes=1]
haveemps	Can you verify your employer or school (if attending)? [**Answers:** No=2, Yes=1]
l.drift	Do you have a regular living situation (an address where you usually stay and can be reached)? [**Answers:** No=2, Yes=1]
mnth.local	How long have you been living in this area? [**Answers:** 0-2 mos.=2, 3-5 mos.=2, 6-11 mos.=2, 1+yrs=1]
res.moves	How often have you moved in the last twelve months? [**Answers:** 0=0, 1=1, 2=2, 3=3, 4=4, 5+=5]
d.current	Were you using drugs or under the influence of drugs when arrested for current offense? [**Answers:** No=1, Yes=2]
ever.rx.a	Have you ever been in formal treatment for alcohol such as counseling, outpatient, inpatient? [**Answers:** No=1, Yes=2]
age.a.assessment	Age at assessment [**Answers:** integer value]
larceny	Is the current top charge a felony property or fraud offense? [**Answers:** No=1, Yes=2]
n.pending	What is the number of other pending warrants, holds or charges? [**Answers:** 0=0, 1=1, 2=2, 3=3, 4+=4]
fam.freq	How often do you have contact with your family? [**Answers:** No Family=2, Never=2, Less Than 1x/mo.=2, 1x/wk=1, Daily=1]

The following transformation is applied before calculating the regression equation:

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- agetrncten = Age-at-COMPAS-Assessment transform: $(age/10)^{-2}$)

Age-at-COMPAS-Assessment: (screening date - birth date)/ 365.25. Use screening date as opposed to date created.

Before being transformed to agetrncten, Age is rounded to one decimal place. Note that for rounding off a 5, rounding is to the nearest value (NEAREST-AWAY-FROM-ZERO). Therefore round(32.44) is 32.4 and round(32.45) is 32.5. Note that intermediate rounding is prohibited.

After transforming and recoding the inputs, the following equation is used to score the Pretrial Release Risk Scale:

Pretrial Release Risk Scale = $(agetrncten * 1.978) + (larceny * 0.578) + (n_pending * 0.203) + (anyarrest_onbail * 0.157) + (n_fta * 0.068) + (n_jails * 0.095) + (famcontact * 0.641) + (l_drift * 0.158) + (notlocalyr * 0.379) + (res_moves * 0.054) + (d_current * 0.193) + (ever_rx_a * 0.113) + (skill * 0.064) + (havemp_r * 0.144)$

NOTE: THE PRETRIAL RELEASE RISK SCALE IS ROUNDED TO TWO DECIMAL PLACES.

Pretrial Release Risk Distribution Plots

Figure 3.26 shows a set of distribution plots of the Pretrial Release Risk Scale. The plots compare the Pretrial Release Risk Scale distributions of Men and Women in the WIDOC DCC sample with the distributions in the Composite Norm group. The quantile-quantile plots (a) for both women (left panel) and men (right panel) show that the plotting points lie slightly below the diagonal reference line, indicating the Pretrial Release Risk Scale distributions in the WIDOC DCC Sample are similar to the distributions in the default Core Composite Norm Group. The density plots (b) in Figure 3.26 indicate that the Pretrial Release Risk Scale distributions in the WIDOC DCC Sample and Core Composite Norm Group have similar shapes. The mass of the WIDOC distributions is shifted somewhat more to the left in comparison to the norm group distributions. The box plots (c) in Figure 3.26 indicate that men and women in the WIDOC sample have lower median scores in comparison to men and women in the norm group. The distributions of women and men in the WIDOC sample have similar skew and spread as the distributions of women and men in the norm group.

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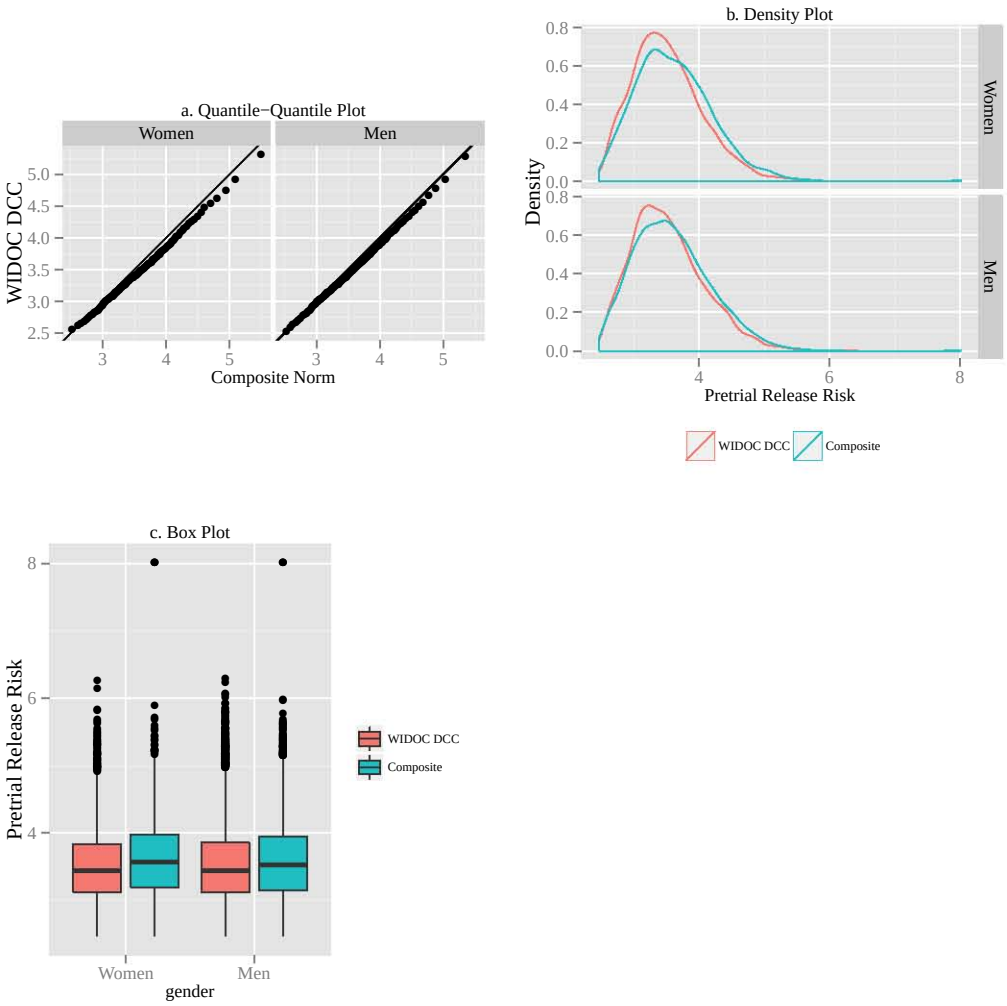

Figure 3.26: Distribution Plots of the Pretrial Release Risk Scale in the WIDOC DCC Sample and COMPAS Composite Norm Data.

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Pretrial Release Risk Scale Deciles Comparison

Table 3.44 compares the Pretrial Release Risk Scale decile cutting points in the Core Composite norm groups with the decile cutting points in the WIDOC DCC samples. For the Pretrial Release Risk Scale, the decile cutting points for determining low, medium, and high scores are located at the 5th decile (50th percentile) and 8th decile (80th percentile). When the men's default Core Composite Norm is used as the reference group, then a raw Pretrial Release Risk Scale score of 4.07 would be located at D8 and scored High. A scale score of 4.07 is located at D9 for men in the WIDOC DCC sample and would be scored High if the agency data were used as the reference for making the cuts.

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Table 3.44: Pretrial Release Risk Scale Deciles in the WIDOC DCC Sample and Core Composite Norm Group

Sample	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Women Composite	2.92	3.11	3.27	3.40	3.57	3.72	3.89	4.08	4.38	8.01
Women DCC	2.86	3.06	3.20	3.32	3.45	3.59	3.75	3.94	4.24	6.26
Men Composite	2.89	3.07	3.23	3.38	3.53	3.68	3.85	4.07	4.39	8.01
Men DCC	2.86	3.05	3.19	3.32	3.45	3.60	3.76	3.97	4.29	6.30

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3.2.22 Supervision Matrix

Description of Supervision Matrix

A two-dimensional supervision matrix based on the General Recidivism Risk and Violent Recidivism Risk scales was developed for use in prison and community corrections settings. The first dimension is defined by the Violent Recidivism Risk decile score and the second dimension by the General Recidivism Risk decile score. The four levels of the Supervision Matrix and their definitions are shown in Table 3.45.

Table 3.45: Definition of Supervision Matrix Levels.

Level	Definition
Low	<= 50th pctl. on both General & Violent Recidivism Risk
Medium	>= 60th & <= 70th pctl. on either General or Violent Recidivism Risk
Medium High	>= 80th pctl. on either General or Violent Recidivism Risk
High	>= 80th pctl. on both General & Violent Recidivism Risk

Supervision Matrix Cell Distributions: Comparison of WIDOC DCC Sample and Theoretial Splits

Figure 3.27 compares the proportion of men and women classified into each level of the Supervision Matrix in the WIDOC DCC study sample with expected splits. The expected splits are what would be obtained if both risk scales in the WIDOC DCC sample are cut to obtain theoretical splits into Low, Medium, and High (40-30-30), and the Spearman rank order correlation between the risk scales is close to what is typically observed in our probation study samples for both men and women ($\rho \approx .65$). The expected split for the Supervision Matrix is 44-22-19-15 for women and 38-21-19-22 for men. Note that for the Violent Recidivism Risk Scale we applied *gender-neutral* cuts to obtain a 40-30-30 split in the full sample, and for the General Recidivism Risk Scale we used *gender-specific* cuts to obtain 40-30-30 splits in the women's and men's samples separately.

In the WIDOC DCC study sample the split is 59-20-14-7 for women and 53-19-15-14 for men. Thus, there is a downward shift in the distribution for women relative to the expected splits. There is also a downward shift for men. Overall the recommended supervision level splits in the WIDOC DCC study sample are shifted substantially lower than the expected splits.

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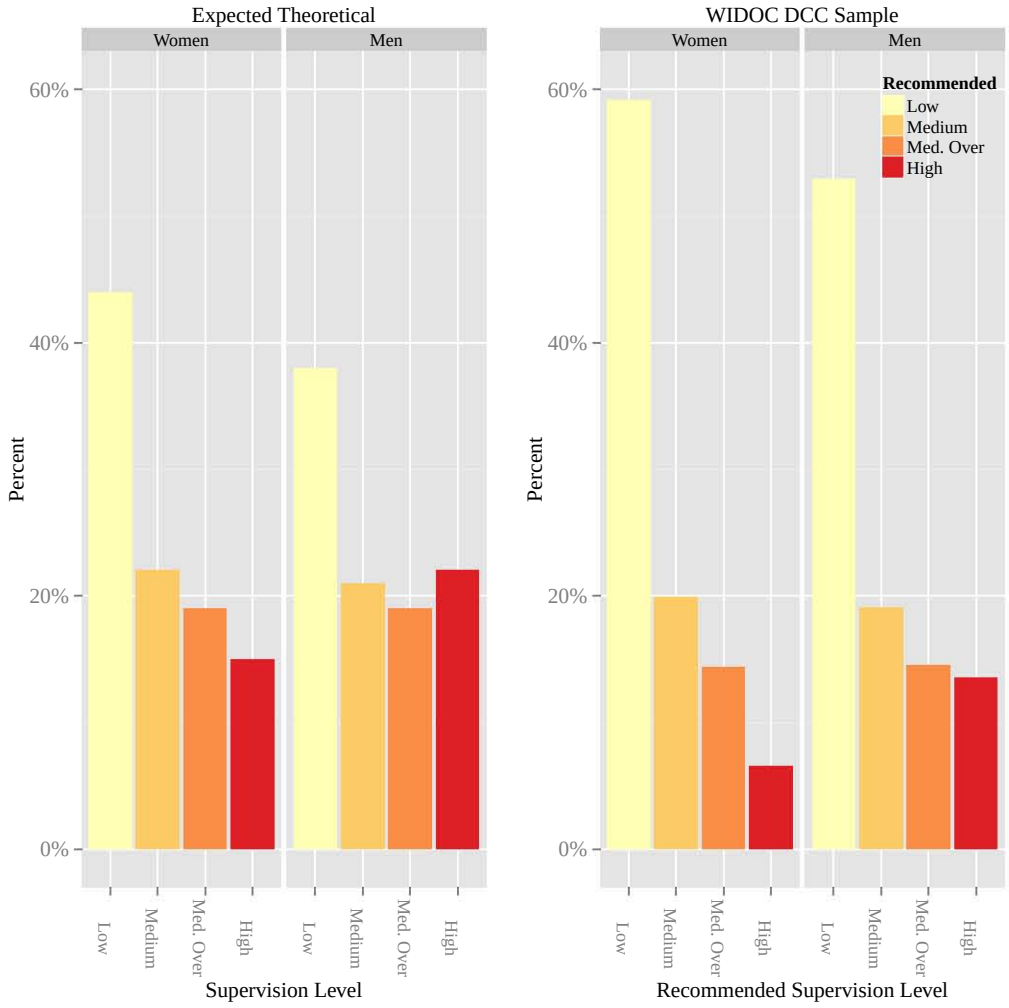

Figure 3.27: Comparison of proportions of offenders within the levels of the Recommended Supervision Matrix in the WIDOC DCC study sample with expected proportions, by gender.

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Figure 3.28 shows a bar chart of the percentage of women and men in the *actual supervision levels*. The bars are stacked with the *recommended supervision level* percentages. Refering back to Figure 3.27, approximately 15% of the men in the WIDOC DCC sample initially had a *recommended supervision level* of medium with override consideration. Figure 3.28 shows that 9% of the men in the sample moved from medium with override consideration to medium, 4% to high, and 1% to intensive.

For 34% of the men in the sample, the *actual supervision level* is medium. The recommended supervision level of 9% of the men in the sample changed from medium with override consideration to medium, and the recommended supervision level of 8% of the men changed from low to medium. The recommended supervision level of 16% of the men in the sample was medium and did not change.

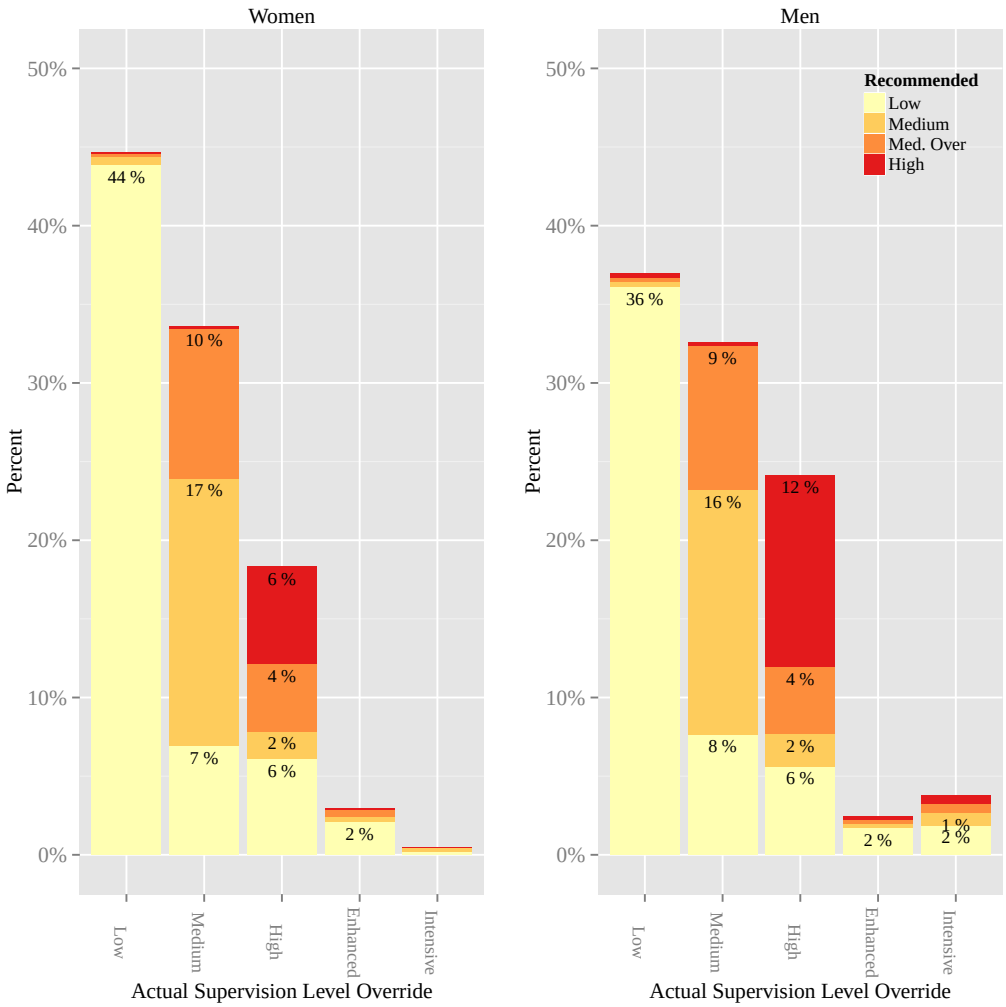

Figure 3.28: Percentage of Women and Men in the Actual Supervision Levels Stacked with the Recommended Supervision Level Percentages.

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3.3 Evaluating the Proportions of Cases in the Levels of the Core Scales

The COMPAS scales are normed with the goal of placing individuals from a given population into three levels with specific proportions. Three basic decile cutting point schemes are used in COMPAS: (1) Cuts located at Decile 5 and Decile 8 resulting in approximate proportions in the low, medium, and high levels of 40%, 30%, and 30%, respectively; (2) Cuts located at Decile 3 and Decile 5 resulting in approximate proportions in the unlikely, probable, and highly probable levels of 20%, 20%, and 60%, respectively; and (3) Cuts located at Decile 6 and Decile 8 resulting in approximate proportions in the unlikely, probable, and highly probable levels of 50%, 20%, and 30%, respectively. An explanation of scale types and deciles cutting point schemes is given on page 18.

We refer to these pre-specified proportions as *theoretical* proportions. Unfortunately, many of the COMPAS needs scales cannot be cut to meet the theoretical proportions because their scores are concentrated at particular discrete values. Figure 3.29 displays the distribution of scores for the Current Violence Scale and provides an example of this clumping of scores. Note that 60% of the scores are zeros, so that at least 60% of the sample must be placed in the Low level, which deviates considerably from the theoretical proportion of 0.40. When evaluating the proportions in the levels of a scale, the scale distribution should be taken into account, because it may determine how well or if the scale can be cut into proportions that match the *theoretical* proportions.

To help understand this problem, we have developed a special *norm table* for the COMPAS scales. Table 3.46 displays the norm table for men in the DCC study sample. The table is organized by scale type and decile cutting point scheme. The table displays for each scale, the *observed* proportions in each level, the *best* possible proportions in each level for the sample as identified with the R statistical package, and indices of dissimilarity between the observed proportions and the theoretical proportions (D_{obs}) and between the best proportions and the theoretical proportions (D_{best}). Note that the *observed* proportions are the result of using the default Composite Norm Group as a reference for scoring the deciles in the DCC study sample.

The index of dissimilarity (see, Simonoff, 2003, p. 78) is computed with the following simple formula:

$$D = \frac{1}{2}\sum_{i=1}^{k} |p_i - \hat{p}_i| \,, \tag{3.1}$$

where i varies over the levels 1to k, p_i is the proportion for level i, and $\hat{p}_i$ is a pre-specified proportion for level i. For our application, the pre-specified proportions ($\hat{p}_i$) are always the theoretical proportions and the p_i are either the observed proportions (D_{obs}) or the best proportions (D_{best}).

D has a useful heuristic interpretation. It gives the proportion of cases in the sample that needs to change levels to match the pre-specified proportions. If D_{obs}, for example, is 0, no cases need to change levels, and the observed and pre-specified proportions are identical. If D_{obs} is 0.10, 10% of the cases need to change levels to match the pre-specified proportions.

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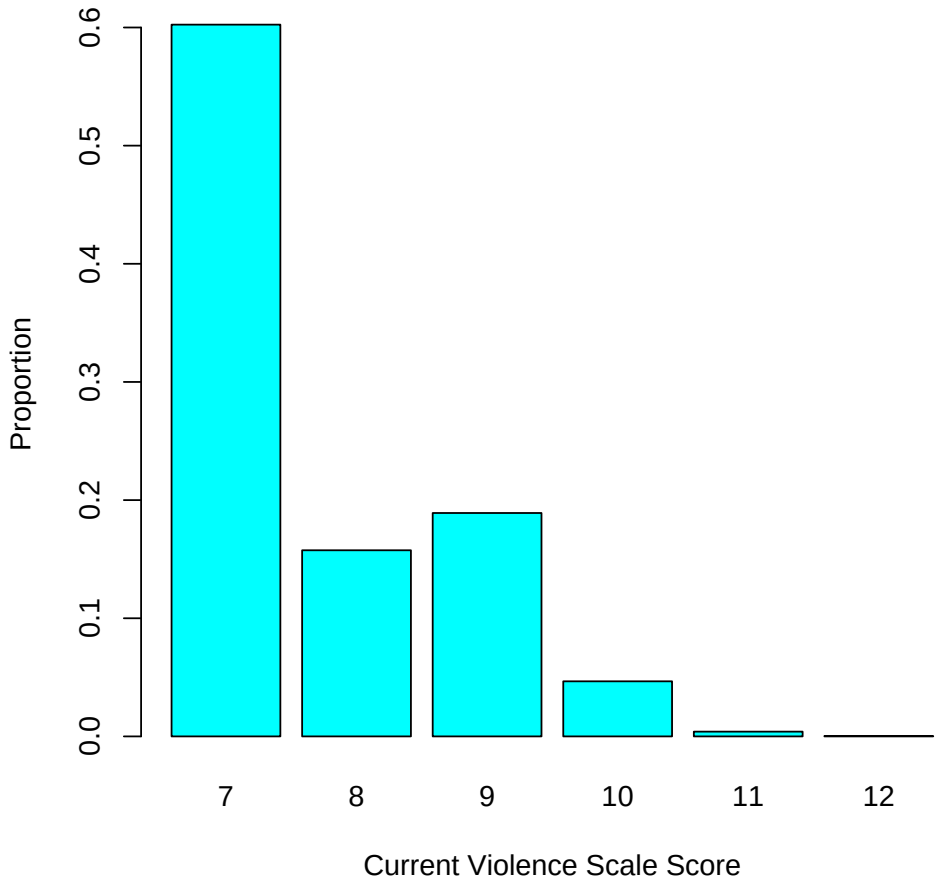

Figure 3.29: Distribution of scores for the Current Violence Scale for men. Most scores are concentrated at the minimum value of 7.

The index of dissimilarity does not take into account the ordering of the levels, which is a potential weakness of the measure. Other measures, however, that we have examined that *do* take into account the ordering of levels are less effective at identifying poor matches between the observed and theoretical proportions that would be identified by a person. The index of dissimilarity is especially good at identifying when the proportion of cases for at least one of the levels is far from what it should be.

The last column in the norm table presents the difference (Δ) between D_{obs} and D_{best}. This value gives a measure of how much the alignment of the observed proportions with the theoretical proportions could be improved. *It tells us how much better the proportions in the levels could match the theoretical proportions if we changed the cutting points in the most optimal way available to us.* As a rough guide, values of Δ less than 0.05 indicate that the observed proportions are aligned as well as possible and values greater than 0.20 indicate that the alignment could be significantly improved by changing the cut points.

Returning to the example of the Current Violence scale, we see from the norm table that both

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Table 3.46: The observed proportions in each level, the best empirical proportions for the DCC sample, and the indices of dissimilarity for men. See text for details.

		Observed			Best			Dissimilarity		
Scales	n	Low	Med.	High	Low	Med.	High	D_{obs}	D_{best}	Δ
40-30-30 Cuts										
Criminal Involvnt	19774	78	14	8	42	31	27	0.38	0.03	0.35
Noncompliance Hx	19774	67	18	15	57	18	25	0.27	0.17	0.10
Violence History	19774	48	29	23	48	29	23	0.08	0.08	0.00
Current Violence	19774	60	0	40	60	16	24	0.30	0.20	0.10
Criminal Associates	19774	60	23	17	39	21	40	0.20	0.10	0.11
Cognitive Behavioral	13952	43	30	27	40	27	33	0.03	0.03	0.00
Anger	13952	50	26	24	50	20	30	0.10	0.10	0.00
Pretrial Release Risk	13952	46	30	25	40	30	30	0.06	0.00	0.05
Violent Recidivism	19774	54	27	19	40	30	30	0.14	0.00	0.14
General Recidivism	19774	52	26	22	40	30	30	0.12	0.00	0.12
20-20-60 Cuts										
Substance Abuse	19774	22	25	53	22	25	53	0.07	0.07	0.00
50-20-30 Cuts										
Financial Problems	13952	43	30	26	43	17	40	0.10	0.10	0.00
Voced Problems	19774	46	17	37	54	17	29	0.07	0.04	0.02
Family Crime	13952	50	17	33	50	17	33	0.03	0.03	0.00
Social Environment	13952	67	15	19	67	15	19	0.17	0.17	0.00
Leisure	13952	55	16	29	47	18	35	0.05	0.05	0.00
Residential Inst.	13952	41	23	36	50	23	27	0.09	0.03	0.06
Social Adjustment	13952	41	20	39	51	26	23	0.09	0.07	0.02
Socialization Fail.	13952	71	12	16	55	17	29	0.21	0.05	0.17
Criminal Opp.	13952	49	17	35	49	17	35	0.05	0.05	0.00
Social Isolation	13952	54	21	25	47	21	32	0.05	0.03	0.02
Criminal Thinking	19774	64	20	16	57	16	27	0.14	0.07	0.07
Criminal Personality	19774	44	26	31	50	20	31	0.06	0.01	0.06

the observed and best proportions poorly match the theoretical proportions. The observed percentages in Low, Medium, High are 60, 0, and 40, respectively, whereas they should be 40, 30, and 30. The corresponding D_{obs} for this pattern of results is 0.30, which indicates that 30% of the cases would need to shift levels to meet the theoretical proportions. While this is clearly a poor match, note that the match of the best possible proportions to the theoretical proportions for the sample are also very poor. These percentages are 60, 16, and 24 , respectively, with a D_{best} value of 0.20. The difference between D_{obs} and D_{best} is 0.10, indicating that the alignment with the norm sample could be improved slightly.

Decisions about the quality of the norms should *not* be based solely on the D values. D and Δ do not take into account whether it is worse to have mismatching proportions in one level versus another. It may be desirable, given the sample, to put relatively fewer people into the higher level. The direction of the mismatches and the level in which they occur (e.g., High

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versus Medium) is important to the stakeholder. There are also issues concerning what norms are available to achieve improvements and what norm samples are most natural to compare with current sample. These and related issues are explored elsewhere in this report.

The results presented in Table 3.46 for the men indicate that many of the scales are aligned with the norm sample as well as possible. Twelve out of the 22 scales have Δ values less than or equal to 0.05. Several of the scales have relatively large Δ values. The Criminal Involvement, Violent Recidivism, and Socialization Failure scales have the largest Δ values and are given special attention in other parts of this report.

Table 3.47 displays a norm table for the women in the DCC sample. The best cuts for the Current Violence scale result in only two levels, so that scales cannot be analyzed with this approach. Many of the other scales are aligned as well as possible with the norm sample, with 12 of them having Δ values less than or equal to 0.05. The Criminal Involvement, Criminal Associates, Violent Recidivism, General Recidivism, Socialization Failure, and Criminal Thinking scales have the largest Δ values. Problems associated with the norming of these scales are discussed elsewhere in this report.

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Table 3.47: The observed proportions in each level, the best empirical proportions for the DCC sample, and the indices of dissimilarity for women. See text for details.

		Observed			**Best**			**Dissimilarity**		
Scales	n	Low	Med.	High	Low	Med.	High	D_{obs}	D_{best}	Δ
40-30-30 Cuts										
Criminal Involvnt	5999	81	15	4	46	29	25	0.41	0.06	0.35
Noncompliance Hx	5999	79	11	10	69	10	21	0.39	0.29	0.10
Violence History	5999	66	15	19	66	15	19	0.26	0.26	0.00
Current Violence	5999	71	0	29						
Criminal Associates	5999	66	20	14	42	39	19	0.26	0.11	0.15
Cognitive Behavioral	3641	42	31	27	38	32	30	0.03	0.02	0.01
Anger	3641	54	24	22	39	22	39	0.14	0.09	0.06
Pretrial Release Risk	3641	46	31	23	40	30	29	0.07	0.01	0.06
Violent Recidivism	5999	69	23	9	40	30	30	0.29	0.00	0.29
General Recidivism	5999	53	28	19	40	30	30	0.13	0.00	0.13
20-20-60 Cuts										
Substance Abuse	5999	30	20	51	30	20	51	0.10	0.10	0.00
50-20-30 Cuts										
Financial Problems	3641	49	14	37	49	14	37	0.07	0.07	0.00
Voced Problems	5999	51	19	30	51	19	30	0.01	0.01	0.00
Family Crime	3641	49	17	34	49	17	33	0.04	0.03	0.00
Social Environment	3641	69	13	18	69	13	18	0.19	0.19	0.00
Leisure	3641	49	23	28	49	23	28	0.03	0.03	0.00
Residential Inst.	3641	46	24	30	52	18	30	0.04	0.02	0.02
Social Adjustment	3641	42	21	37	53	19	28	0.08	0.03	0.05
Socialization Fail.	3641	68	14	18	49	19	32	0.18	0.02	0.15
Criminal Opp.	3641	49	25	26	49	18	33	0.05	0.03	0.02
Social Isolation	3641	58	20	22	50	20	31	0.08	0.01	0.08
Criminal Thinking	5999	56	28	17	50	20	30	0.13	0.00	0.13
Criminal Personality	5999	48	23	29	48	23	29	0.03	0.03	0.00

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