

## **Aggression Replacement Training in a Probation Setting: Technical Appendix**

Due to the amount of analyses performed in this study and the amount of detail necessary to understand the complexity of the analyses, we felt it important to create a separate document that can disseminate that information, but does not dilute the primary message for those only concerned with the basic metrics.

### **CJAA**

In 1997, the Washington State Legislature passed E2SHB 3900, part of which created the Community Juvenile Accountability Act, which dictated that only programs shown to reduce recidivism in a cost-effective manner will be funded under this act. This resulted in a review of research from across the country, which identified five programs for possible implementation. Of these five programs, the juvenile courts selected Aggression Replacement Training (WSART) and Functional Family Therapy (FFT).<sup>1</sup>

The second part of the process was for the Washington State Institute for Public Policy (WSIPP) to maintain a list of Evidence-Based, Research-Based, and Promising Practices. WSIPP has maintained these lists and publish periodic updates to the inventory<sup>2</sup>, which include the programs and their benefit-cost results.<sup>3</sup> As discussed in the WSART report, the WSIPP

---

<sup>1</sup> WSIPP. (January 1999). The Community Juvenile Accountability Act: Research-Proven Interventions for the Juvenile Courts.

<sup>2</sup> The benefit-cost result is calculated by the combining costs and benefits from the perspectives of participants, taxpayers, and others in society. A full accounting of their method can be found in the document in the next footnote. The meta-analyses are conducted by WSIPP and a list of the studies used for each program is maintained by WSIPP.

<sup>3</sup> Washington State Institute for Public Policy (June 2016). Benefit-cost technical documentation. Olympia, WA: Author.

Inventory repeatedly lists WSART (\$10.38:\$1)<sup>4</sup> as having the highest benefit-cost ratios for juvenile probationers in Washington State.

The third part of the process involves regular testing of program outcomes to ensure that programs are maintaining reductions in recidivism and positive cost-benefits for the community and state. This process began with Barnoski's 2004 study of WSART and FFT, but, until now, there has not been another assessment of these programs. Without regular testing of program outcomes, we rely on, potentially, outdated information that does not reflect current practices or populations.

## **Data and Methodology**

### *Therapist Adherence*

The complete therapist adherence scores have not yet been shared by those in charge of the WSART program, but their scale ranges from 1-4 with a score of one being not competent, two being considered borderline competent, a score of three being competent, and four being considered highly competent. The WSART program does not maintain quarterly scores nor were the scores from that period connected to individual therapist scores, so 2010-2012 therapist adherence scores exist only at the county-level and cover the entire calendar year.

### *Matching*

The effect of the matching is evident in the mean propensity scores before and after the matches. The difference between the mean propensity scores for the control and treatment groups went from .248 to less than .010<sup>5</sup>.

---

<sup>4</sup> WSIPP. (February 2015). What Works and What Does Not? Benefit-Cost Findings from WSIPP.

<sup>5</sup> For additional information on the study subjects' demographics before and after matching, see Appendix C.

## WSART Average Propensity Scores Before and After Matching

	Control Group	Treatment Group
ART – Before match	.373	.621
ART – After match	.496	.504

In addition to documenting the change in propensity scores as a measure of improved similarity between the two groups, we analyzed the standardized mean differences for each variable in the matching program. The standard mean differences were calculated both before and after the propensity score matching was conducted. While several variables showed wide discrepancies prior to being matched, all but one<sup>6</sup> fell within the preferred range of less than 0.1 after matching.<sup>7</sup> However, it is important to remember that while the whole treatment and control groups were matched, they were not matched within sub-groups. This could result in treatment and control groups that look very different from each other within a given demographic group.

---

<sup>6</sup> The standard mean difference for Dynamic Protective School increased from -0.01 to 0.10.

<sup>7</sup> Guo, S. and Fraser, M.W. (2010). Propensity Score Analysis. Thousand Oaks, CA: Sage Publications, Inc.

# WSART Standard Means and Deviations

Variable	Pre-Match SMD	Post-Match SMD
Male	-0.05	0.01
Female	0.05	-0.01
Age	0.48	0.00
Dynamic Risk Skill Factors	-1.05	-0.09
Dynamic Protective Skill Factors	1.05	0.07
Criminal History Factors	0.38	-0.01
Static Risk School Factors	-0.19	-0.02
Static Protective School Factors	0.06	0.01
Dynamic Risk School Factors	0.18	-0.01
Dynamic Protective School Factors	-0.18	0.01
Dynamic Risk School History Factors	-0.63	-0.09
Dynamic Protective School History Factors	0.01	0.10
Dynamic Risk Freetime Factors	0.03	0.00
Dynamic Protective Freetime Factors	-0.06	0.02

Variable	Pre-Match SMD	Post-Match SMD
Static Protective Freetime Factors	-0.05	0.03
Static Protective Employment Factors	0.24	0.03
Dynamic Protective Employment Factors	0.40	0.00
Static Risk Social History Factors	0.09	-0.02
Static Protective Social History Factors	0.03	0.05
Dynamic Risk Relationship Factors	-0.14	-0.04
Dynamic Protective Relationship Factors	0.30	0.02
Static Risk Family History Factors	0.00	-0.04
Static Protective Family History Factors	0.05	0.01
Dynamic Risk Family History Factors	0.06	-0.01
Dynamic Protective Family History Factors	-0.06	0.01
Dynamic Risk Current Family Factors	-0.38	-0.03
Dynamic Protective Current Family Factors	0.13	0.05

Variable	Pre-Match SMD	Post-Match SMD
Static Risk Alcohol and Drug Factors	0.83	-0.02
Static Protective Drug and Alcohol Factors	-0.08	0.03
Dynamic Risk Current Drug and Alcohol Factors	0.05	0.01
Dynamic Protective Current Drug and Alcohol Factors	-0.09	-0.02
Dynamic Risk Past Drug and Alcohol Factors	0.42	0.00
Dynamic Protective Past Drug and Alcohol Factors	0.10	0.01
Static Risk Mental Health Factors	-0.11	0.01
Static Protective Mental Health Factors	0.09	0.00
Dynamic Risk Current Mental Health Factors	-0.04	-0.01
Dynamic Protective Current Mental Health Factors	0.12	0.04
Dynamic Risk Past Mental Health Factors	-0.02	-0.02
Dynamic Protective Past Mental Health Factors	-0.16	0.00
Dynamic Risk Attitude Factors	-0.54	-0.06
Dynamic Protective Attitude Factors	0.58	0.05
Dynamic Risk Aggression Factors	-0.75	-0.02
Dynamic Protective Aggression Factors	0.55	0.01

### *Gender*

Beyond the overall felony recidivism and felony recidivism by therapist adherence category analyses, we examined outcomes for several demographic variables to try and provide more insight into the overall results. One variable of particular interest to stakeholders is gender. The large majority of participants in WSART are male, consistent with participation in the criminal justice system. There was a 5.5% increase in felony recidivism outcomes among males, representing a 25.3% increase in felony recidivism. For females, the difference between the treatment and control groups was 0.2%, representing a 1.9% increase in felony recidivism. The increase in felony recidivism among males in the treatment group was statistically significant.

## WSART Felony Recidivism by Gender

	Group	Number of Subjects	Felony Recidivism Percentages (%)
Males	Control Group	718	21.7
	Treatment Group	714	27.2
Females	Control Group	233	10.3
	Treatment Group	237	10.5

### *Race/Ethnicity*

Like gender, additional analysis was done among racial and ethnic groups within the study. The racial/ethnic classification was based upon self-identification and only the largest three groups (White, Black, and Hispanic) were included in the below table. Other racial groups were included in the study (American Indian/Native Alaskan, Asian, Native Hawaiian/Pacific Islander, and Other race); however, their numbers were too small to draw reasonable conclusions and, while they were included in the larger study, they were not included in the table.

Whites saw a 5.0% rise in felony recidivism from control to treatment group, which represents a 31.1% increase. Blacks had a 2.5% increase in felony recidivism rates among those that participated in WSART, which is equivalent to a 9.2% rise in felony recidivism. Hispanics in WSART showed a 0.8% increase in felony recidivism rates, representing a 3.7% rise in felony recidivism.

## WSART Felony Recidivism by Race

	Group	Number of Subjects	Felony Recidivism Percentages (%)
White	Control Group	540	16.1
	Treatment Group	540	21.1
Black	Control Group	128	27.3
	Treatment Group	151	29.8
Hispanic	Control Group	190	21.6
	Treatment Group	183	22.4

### Age

It is important to note that although we analyzed each age from 10 to 18, the groups at each end of that range were small and were combined with the neighboring groups until we believed they were large enough to be analyzed on their own. Also, we believe it is important to note the trend in felony recidivism across age categories. The largest felony recidivism rates and greatest increases in felony recidivism from control group to treatment group happened before age 16. The lowest recidivism rates and greatest reductions in felony recidivism from control group to treatment group began at age 16. These rates drop consistently after age 15 so that the 17 and 18 year old category has the lowest felony recidivism rates of any group. This finding is consistent with criminological literature and the age-crime curve<sup>8</sup>.

The highest felony recidivism rates among WSART participants are those in the 15 age group. They have a 31.4% felony recidivism rate among the treatment groups, but the largest

<sup>8</sup> Farrington, D. (1986). Age and Crime. *Crime and Justice*. Vol. (7). P. 189.

increase in felony recidivism between the control and treatment groups happens among 15 year olds, with a 10.2% increase in felony recidivism. These numbers decrease slightly at the 16 age group and then again with the 17 to 18 age group, where the treatment has a 12.0% felony recidivism rate, a decrease of 3.4% from the control group. The increase in felony recidivism between the treatment and control group for subjects age 15 and under was statistically significant.

WSART Felony Recidivism by Age			
	Group	Number of Subjects	Felony Recidivism Percentages (%)
11-13 years	Control Group	75	25.3
	Treatment Group	67	31.3
14 years	Control Group	122	22.1
	Treatment Group	117	29.9
15 years	Control Group	217	21.2
	Treatment Group	207	31.4
16 years	Control Group	226	17.7
	Treatment Group	286	22.7
17-18 years	Control Group	311	15.4
	Treatment Group	274	12.0

*Risk*

The risk categories are important to this discussion as they capture a number of factors not included in the other demographic categories. However, they are also complicated for this same reason. Risk categories are not a single variable, but rather a composite variable consisting of risk and protective scores based upon the individual’s criminal history, school, family, aggression, employment, and other factors, such that two individuals with the exact same scores may be very different based on the individual components of the risk assessment instrument.



Despite the potential differences, the results show consistency. The high-risk control and treatment groups recidivated at a higher rate than their moderate-risk counterparts and the lowest felony recidivism score in the high-risk group was still greater than the highest felony recidivism rate in the moderate-risk group. The moderate risk treatment group had a 17.5% felony recidivism rate which was 2.5% higher than the felony recidivism rate for the control group. The high risk treatment group recidivated 27.6% of the time, which is a 5.4% increase over the control group. The increase in felony recidivism from the high risk control group to treatment group was statistically significant.

WSART Felony Recidivism by Risk Level			
	Group	Number of Subjects	Felony Recidivism Percentages (%)
Moderate Risk	Control Group	433	15.0
	Treatment Group	429	17.5
High Risk	Control Group	518	22.2
	Treatment Group	522	27.6

*Jurisdiction*

There were 23 jurisdictions that, after matching, had at least one participant in WSART during the timeframe and were able to verify their records against our database. The size of their combined treatment and control groups ranged from 2 to 237 subjects.

Results show that there was a large discrepancy in felony recidivism from one county to another. One can see these variances in the comparison of Cowlitz County to Snohomish County, for example. As discussed above, much of this has to do with the size of the groups, but there are likely differences related to the particular therapists for that jurisdiction, the treatments available to the control group, the jurisdiction’s particular demographics, and possibly the county’s practices related to EBP assignment.

WSART Felony Recidivism by Jurisdiction			
Jurisdiction	Group	Number of subjects	Felony Recidivism (%)
King County	Control Group	116	33.6
	Treatment Group	121	28.9
Benton/Franklin Counties	Control Group	104	15.4
	Treatment Group	111	27.0
Pierce County	Control Group	96	29.2
	Treatment Group	108	24.1
Clark County	Control Group	90	11.1
	Treatment Group	89	24.7
Snohomish County	Control Group	78	25.6
	Treatment Group	71	15.5
Thurston County	Control Group	75	12.0
	Treatment Group	67	19.4
Kitsap County	Control Group	59	8.5
	Treatment Group	55	16.4

Jurisdiction	Group	Number of subjects	Felony Recidivism (%)
Cowlitz County	Control Group	48	4.2
	Treatment Group	62	25.8
Spokane County	Control Group	51	7.8
	Treatment Group	48	14.6
Whatcom County	Control Group	50	10.0
	Treatment Group	43	23.3
Okanogan County	Control Group	39	25.6
	Treatment Group	34	14.7
Walla Walla/Columbia Counties	Control Group	38	13.2
	Treatment Group	35	17.1
Grant County	Control Group	34	32.4
	Treatment Group	34	23.5
Lewis County	Control Group	24	20.8
	Treatment Group	27	33.3
Douglas County	Control Group	13	15.4
	Treatment Group	13	30.8

Jurisdiction	Group	Number of subjects	Felony Recidivism (%)
Kittitas County	Control Group	13	15.4
	Treatment Group	10	30.0
Adams County	Control Group	11	27.3
	Treatment Group	8	25.0
Island County	Control Group	5	40.0
	Treatment Group	4	25.0
Clallam County	Control Group	2	0.0
	Treatment Group	4	0.0
Whitman County	Control Group	2	100.0
	Treatment Group	3	66.7
Jefferson County	Control Group	1	0.0
	Treatment Group	2	0.0
Klickitat County	Control Group	1	0.0
	Treatment Group	1	0.0
Lincoln County	Control Group	1	0.0
	Treatment Group	1	0.0

### *Starters v. Completers*

One area that is not a demographic, but does merit discussion is the felony recidivism rate among those who completed their program, compared to those we know started their program, but did not, or were not able to, complete their program. Drawing conclusions from these data is complicated by the notion that those who completed the program demonstrate abilities that likely also contribute to them not recidivating. Before discussing the felony recidivism numbers, it is important to note the majority of subjects who started WSART also completed the program (68.8%). It is also important to note this number does not reflect the matched sample, as it is not necessary to compare the treatment group to the control group in this case. We do, however, include an analysis of the matched group in order to examine the difference between the matched subjects who completed the program to the matched control group.

In the unmatched sample, the felony recidivism rate of those who completed the program was 18.3% as opposed to 32.7% for those who started, but did not finish the program. The analysis showed a statistically significant reduction in felony recidivism among those who completed WSART, as opposed to those who started, but did not complete the therapy.

## Unmatched WSART Recidivism Starters v. Completers

Type of Recidivism	Started, did not complete (N=498)	Completed (N=1,101)
	Recidivism Percentages (%)	Recidivism Percentages (%)
Misdemeanors Only	27.5	29.2
Felonies	32.7	18.3
Violent Felonies	13.7	6.7

As discussed in the report, because of the statistically significant decrease in recidivism from those who started but did not finish WSART compared to those who completed the program, we included matched comparison of the felony recidivism rates based on a per protocol research approach. For this method, we followed the same procedures for creating the control group, except instead of matching them to all WSART participants from the study period, we matched them to those who began WSART during the study period and were coded as having completed the program. The completers had an 18.6% felony recidivism rate and the control group had a 17.4% felony recidivism rate. The 1.2% increase in felony recidivism from the control group to those who completed WSART was not statistically significant.

## Per Protocol Matched WSART Recidivism Findings

	Number of Subjects	Misdemeanor Recidivism Percentages (%)	Felony Recidivism Percentages (%)	Violent Felony Recidivism Percentages (%)
Control Group	732	28.4	17.4	6.3
Treatment Group	732	30.6	18.6	5.9

## Appendix A: **Washington Evidence Based Program Eligibility**

### **WSART**

At least moderate risk level and one of the following:

Aggression problems as indicated by a static risk factor score of at least 1 for a weapon, violent misdemeanor, or felony (Domain 1; Items 4, 5, or 6)

Dynamic risk factor of at least 2 out of 13 (Domain 11; Items 2,3, & 4)

Attitude problems as indicated by a dynamic risk score of at least 5 (Domain 10; Items 6-10)

Skill problems as indicated by a dynamic risk score of at least 4 (Domain 12; all items except 2)

## **Appendix B: Description of Service Delivery for Each Evidence-Based Program<sup>9</sup>**

The following are brief descriptions of how each evidence-based program is delivered. These provide a basis for understanding direct service costs. The juvenile courts incur additional costs to assess, assign, and manage the youth provided these services.

**Aggression Replacement Training (WSART):** ART is a 10-week, 30-hour intervention administered to groups of ten moderate- to high-risk youth three times per week. There is an instructor and co-instructor for each ART group. The courts have found that paying a youth's transportation to ART or having ART groups meet in locations other than the juvenile court is needed to maintain ART class attendance.

Washington State has its own ART specialist who oversees training and quality assurance, and ART consultants who work with groups of ART instructors to maintain program fidelity. In addition, ART trainers teach new ART instructors. ART is provided by court probation staff or private contractors.

Courts often have their probation counselors attend ART training so they have a thorough understanding of the program.

---

<sup>9</sup> Barnoski, R. (2004). Outcome Evaluation of Washington State's Research-Based Programs for Juvenile Offenders. Washington State Institute for Public Policy. p. 2.



## Appendix C: Additional Pre- and Post-Matching Demographics

### WSART Control and Treatment Groups Demographic Comparison

	Pre-Matching WSART Control (N=1,624)	Pre-Matching WSART Treatment (N=1,600)	Matched WSART Control (N=951)	Matched WSART Treatment (N=951)
Male	74.5%	76.7%	75.5%	75.1%
Female	25.6%	23.3%	24.5%	24.9%
Average Age	15.9	15.3	15.7	15.6
<b>Average Risk Scores</b>				
Criminal History	8.1	7.4	7.7	7.8
Social History	8.4	8.7	8.6	8.7
Aggression	1.9	4.0	3.0	3.0
Drugs/Alcohol	13.4	10.1	12.3	12.4
Family	-0.9	0.3	-0.1	0.1
Prior Family	-0.5	-0.5	-0.5	-0.4
Mental Health	-5.7	-5.3	-5.7	-5.6
School	5.6	7.0	6.5	6.9

	Pre-Matching WSART Control Percentages (N=1,624)	Pre-Matching WSART Treatment Percentages (N=1,600)	Matched WSART Control Percentages (N=951)	Matched WSART Treatment Percentages (N=951)
Moderate Risk Level	45.6%	45.8%	45.5%	45.1%
High Risk Level	54.4%	54.3%	54.5%	54.9%
<b>Race</b>				
White	57.8%	50.5%	56.8%	56.8%
Black	12.7%	15.8%	13.5%	15.9%
Hispanic	20.4%	16.5%	20.0%	19.2%
<b>Age</b>				
11-13	4.7%	10.5%	7.9%	7.1%
14	9.7%	18.5%	12.8%	12.3%
15	18.9%	23.3%	22.8%	21.8%
16	24.2%	25.8%	23.8%	30.1%
17	31.8%	19.5%	25.9%	25.2%
18	9.7%	2.4%	6.8%	3.6%