

Who Benefits Most from Procedural Justice-Informed Alternatives to Contempt in the Child Support Program?

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Charles Michalopoulos



April 2024

Supplemental Materials

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This report was prepared as part of the Procedural Justice-Informed Alternatives to Contempt (PJAC) demonstration and evaluation, funded by the Office of Child Support Services (formerly the Office of Child Support Enforcement), Administration for Children and Families, U.S. Department of Health and Human Services. MDRC and its subcontractors—MEF Associates and the Center for Justice Innovation—are under contract with the Georgia Department of Human Services, Division of Child Support Services to evaluate the PJAC demonstration project.

Dissemination of MDRC publications is supported by the following organizations and individuals that help finance MDRC's public policy outreach and expanding efforts to communicate the results and implications of our work to policymakers, practitioners, and others: The Annie E. Casey Foundation, Arnold Ventures, Charles and Lynn Schusterman Family Foundation, The Edna McConnell Clark Foundation, Ford Foundation, The George Gund Foundation, Daniel and Corinne Goldman, The Harry and Jeanette Weinberg Foundation, Inc., The JPB Foundation, The Joyce Foundation, The Kresge Foundation, and Sandler Foundation.

In addition, earnings from the MDRC Endowment help sustain our dissemination efforts. Contributors to the MDRC Endowment include Alcoa Foundation, The Ambrose Monell Foundation, Anheuser-Busch Foundation, Bristol-Myers Squibb Foundation, Charles Stewart Mott Foundation, Ford Foundation, The George Gund Foundation, The Grable Foundation, The Lizabeth and Frank Newman Charitable Foundation, The New York Times Company Foundation, Jan Nicholson, Paul H. O'Neill Charitable Foundation, John S. Reed, Sandler Foundation, and The Stupski Family Fund, as well as other individual contributors.

The findings and conclusions in this report do not necessarily represent the official positions or policies of the funders.

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OVERVIEW

These materials supplement the report *Who Benefits Most from Procedural Justice-Informed Alternatives to Contempt in the Child Support Program?*, one in a series of publications evaluating the Procedural Justice-Informed Alternatives to Contempt (PJAC) demonstration. This document does not stand alone and should only be read in tandem with that report.

The document is divided into five appendixes. Appendix A includes baseline information on the noncustodial parents enrolled in the PJAC demonstration who were included in the analysis for this report. Appendix B is a technical appendix that describes the methodology used for the analysis. Appendix C presents regression results for the noninteracted models evaluated to answer research question 1. Appendix D presents the regression results for the research group–interacted models evaluated to answer research question 2. Appendix E presents predicted values for three parent profiles for the outcomes analyzed for research questions 1 and 2.

CONTENTS

and EXHIBITS

Overview		iii
Appendix A	Baseline Information on the Noncustodial Parents	1
Tables		
A.1	Baseline Characteristics of Noncustodial Parents in the PJAC Services and Business-as-Usual Groups: Study Enrollment Information	3
A.2	Baseline Characteristics of Noncustodial Parents in the PJAC Services and Business-as-Usual Groups: Parent Demographics	4
A.3	Baseline Characteristics of Noncustodial Parents in the PJAC Services and Business-as-Usual Groups: Recent Earnings and Payments	5
A.4	Baseline Characteristics of Noncustodial Parents in the PJAC Services and Business-as-Usual Groups: Case Complexity	7
A.5	Baseline Characteristics of Noncustodial Parents in the PJAC Demonstration, by Site: Study Enrollment Information	8
A.6	Baseline Characteristics of Noncustodial Parents in the PJAC Demonstration, by Site: Parent Demographics	9

A.7	Baseline Characteristics of Noncustodial Parents in the PJAC Demonstration, by Site: Recent Earnings and Payments	10
A.8	Baseline Characteristics of Noncustodial Parents in the PJAC Demonstration, by Site: Case Complexity	12
Appendix B	Technical Appendix	13
Table		
B.1	Predicted Value Profiles	29
Figure		
B.1	Lasso Model Iterations	28

Appendix C Regression Results for the Noninteracted Models Evaluated to Answer Research Question 1 31

Tables

C.1	Research Question 1 Results: Coefficients on Covariates Representing Parent Demographics	35
C.2	Research Question 1 Results: Coefficients on Covariates Representing Parents' Formal Earnings	36
C.3	Research Question 1 Results: Coefficients on Covariates Representing Study Enrollment Information	37
C.4	Research Question 1 Results: Coefficients on Covariates Representing Case Characteristics	38
C.5	Research Question 1 Results: Coefficients on Covariates Representing Contempt, Payments, and Debt	39
C.6	Research Question 1 Results: Coefficients on Covariates Representing Proportion Paid and Payment Frequency, Excluding California	40

Appendix D	Regression Results for the Research Group-Interacted Models Evaluated to Answer Research Question 2	41
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Tables

D.1a	Research Question 2 Results: Coefficients on Noninteracted Covariates Representing Parent Demographics	46
D.1b	Research Question 2 Results: Coefficients on Covariates Representing Parent Demographics Interacted with Research Group	47
D.2a	Research Question 2 Results: Coefficients on Noninteracted Covariates Representing Parents' Formal Earnings	48
D.2b	Research Question 2 Results: Coefficients on Covariates Representing Parents' Formal Earnings Interacted with Research Group	49
D.3a	Research Question 2 Results: Coefficients on Noninteracted Covariates Representing Study Enrollment Information	50
D.3b	Research Question 2 Results: Coefficients on Covariates Representing Study Enrollment Information Interacted with Research Group	52
D.4a	Research Question 2 Results: Coefficients on Noninteracted Covariates Representing Case Characteristics	54
D.4b	Research Question 2 Results: Coefficients on Covariates Representing Case Characteristics Interacted with Research Group	56

D.5a	Research Question 2 Results: Coefficients on Noninteracted Covariates Representing Contempt, Amount Paid, and Debt	58
D.5b	Research Question 2 Results: Coefficients on Covariates Representing Contempt, Amount Paid, and Debt Interacted with Research Group	60
D.6a	Research Question 2 Results: Coefficients on Noninteracted Covariates Representing Proportion Paid and Payment Frequency, Excluding California	62
D.6b	Research Question 2 Results: Coefficients on Covariates Representing Proportion Paid and Payment Frequency Interacted with Research Group, Excluding California	63
Appendix E	Predicted Values for Three Parent Profiles for the Outcomes Analyzed for Research Questions 1 and 2	65
Tables		
E.1	Predicted Research Question 1 Outcomes for Three Parent Profiles	67
E.2	Predicted Impacts for Research Question 2 Outcomes for Three Parent Profiles	68
References		71



APPENDIX A

Baseline Information on the Noncustodial Parents

APPENDIX TABLE A.1 Baseline Characteristics of Noncustodial Parents in the PJAC Services and Business-as-Usual Groups: Study Enrollment Information

Characteristic (%)	PJAC Services Group	Business-as-Usual Group	Full Sample
Random assignment quarter ^a			
2018 quarter 1 ^b	7.5	7.2	7.4
2018 quarter 2	16.2	15.8	16.1
2018 quarter 3	25.5	25.8	25.6
2018 quarter 4	22.7	22.4	22.6
2019 quarter 1	21.5	22.0	21.7
2019 quarter 2 ^c	6.6	6.8	6.7
Site			
Arizona	17.4	17.5	17.5
California	23.0	23.0	23.0
Michigan	15.2	15.3	15.3
Franklin County, Ohio	16.1	16.0	16.0
Stark County, Ohio	14.4	14.4	14.4
Virginia	13.9	13.7	13.8
Sample size	3,474	1,879	5,353

SOURCES: MDRC calculations based on child support administrative records and quarterly earnings data from the National Directory of New Hires.

NOTES: Sample sizes may vary because of missing values and gaps and delays in data. Statistical significance tests were conducted to assess differences in characteristics across research groups. Statistical significance levels are indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

Rounding may cause slight discrepancies in sums.

For detailed definitions of each covariate, please see Appendix B, Section II, "Covariates."

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, California = 1,231, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.

^aVirginia began enrollment in June (quarter 2) 2018.

^bOnly includes parents who enrolled in February and March 2018.

^cOnly includes parents who enrolled in April 2019.

APPENDIX TABLE A.2 Baseline Characteristics of Noncustodial Parents in the PJAC Services and Business-as-Usual Groups: Parent Demographics

Characteristic (%)	PJAC Services Group	Business-as-Usual Group	Full Sample
Female	9.2	9.7	9.4
Race/ethnicity			
Black, non-Hispanic	39.6	39.9	39.7
White, non-Hispanic	36.0	35.7	35.9
Hispanic	21.8	22.1	22.0
Other	2.5	2.3	2.5
Age			
18-29	19.4	20.1	19.7
30-39	42.5	39.9	41.6*
40-54	34.1	35.9	34.7
55 and older	4.1	4.0	4.1
Sample size	3,474	1,879	5,353

SOURCES: MDRC calculations based on child support administrative records and quarterly earnings data from the National Directory of New Hires.

NOTES: Sample sizes may vary because of missing values and gaps and delays in data. Statistical significance tests were conducted to assess differences in characteristics across research groups. Statistical significance levels are indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

Rounding may cause slight discrepancies in sums.

For detailed definitions of each covariate, please see Appendix B, Section II, "Covariates."

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, California = 1,231, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.



APPENDIX TABLE A.3 Baseline Characteristics of Noncustodial Parents in the PJAC Services and Business-as-Usual Groups: Recent Earnings and Payments

Characteristic (%)	PJAC Services Group	Business-as-Usual Group	Full Sample
Total formal earnings in the year before study enrollment			
\$0	50.7	51.2	50.8
\$0.01 - \$2,499	15.0	15.6	15.2
\$2,500 - \$9,999	18.4	17.8	18.2
\$10,000 - \$19,999	9.4	9.6	9.5
\$20,000 - \$29,999	3.7	3.8	3.7
\$30,000+	2.9	2.0	2.6*
Monthly amount due			
\$0 - \$249	33.7	33.8	33.7
\$250 - \$499	37.8	37.0	37.5
\$500 - \$749	16.0	16.6	16.2
\$750+	12.6	12.7	12.6
Total amount paid in the year before study enrollment			
\$0	44.2	45.2	44.6
\$0.01 - \$999	32.7	31.4	32.2
\$1,000 - \$2,999	15.8	16.1	15.9
\$3,000+	7.3	7.2	7.3
Proportion of child support obligation paid in the year before study enrollment ^a			
0%	40.7	40.3	40.6
1% - 9%	18.6	18.2	18.4
10% - 19%	11.4	11.1	11.3
20% - 29%	7.1	7.6	7.3
30% - 39%	5.2	5.0	5.2
40% - 49%	3.8	4.1	3.9
50% - 99%	8.6	9.2	8.8
100%	4.6	4.4	4.6

(continued)

APPENDIX TABLE A.3 (Continued)

Characteristic (%)	PJAC Services Group	Business-as-Usual Group	Full Sample
Proportion of months with any payment in the year before study enrollment ^a			
0%	41.6	41.3	41.5
1% - 25%	31.2	32.7	31.7
26% - 50%	17.6	16.1	17.1
51% - 75%	7.9	8.6	8.2
76% - 100%	1.7	1.2	1.6
Sample size	3,474	1,879	5,353

SOURCES: MDRC calculations based on child support administrative records and quarterly earnings data from the National Directory of New Hires.

NOTES: Sample sizes may vary because of missing values and gaps and delays in data. Statistical significance tests were conducted to assess differences in characteristics across research groups. Statistical significance levels are indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

Rounding may cause slight discrepancies in sums.

For detailed definitions of each covariate, please see Appendix B, Section II, "Covariates."

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, California = 1,231, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.

^aExcludes California.



APPENDIX TABLE A.4 Baseline Characteristics of Noncustodial Parents in the PJAC Services and Business-as-Usual Groups: Case Complexity

Characteristic (%)	PJAC Services Group	Business-as-Usual Group	Full Sample
More than one open case	41.6	39.8	41.0
Oldest case is five years old or newer	32.0	33.0	32.3
Custodial parent and child(ren) on the primary case receiving Temporary Assistance for Needy Families	11.1	11.2	11.1
Has a debt-only case	31.9	29.0	30.9*
Total child support debt owed			
\$0 - \$9,999	39.2	38.9	39.1
\$10,000 - \$29,999	33.2	33.3	33.2
\$30,000 - \$59,999	15.3	17.8	16.2**
\$60,000 - \$89,999	6.2	5.1	5.8*
\$90,000+	6.2	4.8	5.7**
Ever referred to contempt	32.9	34.6	33.5
Sample size	3,474	1,879	5,353

SOURCES: MDRC calculations based on child support administrative records and quarterly earnings data from the National Directory of New Hires.

NOTES: Sample sizes may vary because of missing values and gaps and delays in data. Statistical significance tests were conducted to assess differences in characteristics across research groups. Statistical significance levels are indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

Rounding may cause slight discrepancies in sums.

For detailed definitions of each covariate, please see Appendix B, Section II, "Covariates."

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, California = 1,231, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.



APPENDIX Table A.5 Baseline Characteristics of Noncustodial Parents in the PJAC Demonstration, by Site: Study Enrollment Information

Characteristic (%)	Arizona	California	Michigan	Franklin County, Ohio	Stark County, Ohio	Virginia	All PJAC Sites
Assigned to PJAC services	64.8	64.8	64.7	65.0	64.8	65.3	64.9
Random assignment quarter ^a							
2018 quarter 1 ^b	10.3	10.9	3.5	10.0	6.8	0.0	7.4
2018 quarter 2	15.2	23.5	14.3	20.3	17.5	0.4	16.1
2018 quarter 3	24.7	29.2	22.8	19.2	30.8	25.9	25.6
2018 quarter 4	21.8	16.7	25.3	19.8	22.6	33.3	22.6
2019 quarter 1	21.8	15.2	25.5	23.7	17.0	30.8	21.7
2019 quarter 2 ^c	6.2	4.5	8.6	7.0	5.3	9.6	6.7
Sample size	935	1,231	817	859	770	741	5,353

SOURCES: MDRC calculations based on child support administrative records and quarterly earnings data from the National Directory of New Hires.

NOTES: Sample sizes may vary because of missing values and gaps and delays in data.

Rounding may cause slight discrepancies in sums.

For detailed definitions of each covariate, please see Appendix B, Section II, "Covariates."

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available.

^aVirginia began enrollment in June (quarter 2) 2018.

^bOnly includes parents who enrolled in February and March 2018.

^cOnly includes parents who enrolled in April 2019.



APPENDIX TABLE A.6 Baseline Characteristics of Noncustodial Parents in the PJAC Demonstration, by Site: Parent Demographics

Characteristic (%)	Arizona	California	Michigan	Franklin County, Ohio	Stark County, Ohio	Virginia	All PJAC Sites
Female	7.0	7.4	10.2	7.2	12.6	14.0	9.4
Race/ethnicity							
Black, non-Hispanic	16.8	17.0	44.6	58.9	34.8	83.9	39.7
White, non-Hispanic	34.8	20.7	50.2	38.4	63.9	14.6	35.9
Hispanic	44.1	58.2	1.8	1.6	0.9	1.3	22.0
Other	4.4	4.1	3.4	1.0	0.4	0.1	2.5
Age							
18-29	15.4	21.5	24.0	20.3	18.3	17.8	19.7
30-39	38.2	43.7	44.8	45.5	38.3	37.7	41.6
40-54	41.2	31.0	28.3	31.5	40.1	37.8	34.7
55 and older	5.2	3.7	2.9	2.7	3.2	6.7	4.1
Sample size	935	1,231	817	859	770	741	5,353

SOURCES: MDRC calculations based on child support administrative records and quarterly earnings data from the National Directory of New Hires.

NOTES: Sample sizes may vary because of missing values and gaps and delays in data.

Rounding may cause slight discrepancies in sums.

For detailed definitions of each covariate, please see Appendix B, Section II, "Covariates."

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available.

APPENDIX TABLE A.7 Baseline Characteristics of Noncustodial Parents in the PJAC Demonstration, by Site: Recent Earnings and Payments

Characteristic (%)	Arizona	California	Michigan	Franklin County, Ohio	Stark County, Ohio	Virginia	All PJAC Sites
Total formal earnings in the year before study enrollment							
\$0	46.7	59.2	46.8	46.8	54.9	47.6	50.8
\$0.01 - \$2,499	13.9	11.1	15.8	15.9	18.0	19.1	15.2
\$2,500 - \$9,999	17.7	16.7	23.0	17.5	15.5	19.3	18.2
\$10,000 - \$19,999	11.6	7.7	9.1	12.0	7.2	9.6	9.5
\$20,000 - \$29,999	6.4	3.1	3.2	4.4	2.3	2.7	3.7
\$30,000+	3.8	2.2	2.2	3.3	2.1	1.8	2.6
Monthly amount due							
\$0 - \$249	30.4	24.1	59.7	13.2	43.8	38.6	33.7
\$250 - \$499	38.5	40.9	27.1	46.0	35.2	34.6	37.5
\$500 - \$749	17.4	17.5	9.4	22.9	12.5	15.8	16.2
\$750+	13.7	17.5	3.8	17.9	8.6	11.0	12.6
Total amount paid in the year before study enrollment							
\$0	39.6	55.0	43.1	35.2	44.4	46.4	44.6
\$0.01 - \$999	32.0	27.9	32.9	34.0	38.6	30.4	32.2
\$1,000 - \$2,999	19.3	12.2	16.0	20.3	12.3	16.5	15.9
\$3,000+	9.2	4.9	8.0	10.6	4.7	6.7	7.3
Proportion of child support obligation paid in the year before study enrollment ^a							
0%	39.3		38.9	35.2	44.4	46.3	40.6
1% - 9%	19.8		13.7	22.5	21.0	14.6	18.4
10% - 19%	12.1		8.8	12.3	12.7	10.5	11.3
20% - 29%	7.4		7.1	8.0	7.4	6.2	7.3
30% - 39%	5.2		4.2	7.0	4.0	5.3	5.2
40% - 49%	3.2		4.0	4.9	3.1	4.2	3.9
50% - 99%	9.1		9.9	9.2	6.4	9.3	8.8
100%	4.0		13.3	0.9	0.9	3.6	4.6

(continued)

APPENDIX TABLE A.7 (Continued)

Characteristic (%)	Arizona	California	Michigan	Franklin County, Ohio	Stark County, Ohio	Virginia	All PJAC Sites
Proportion of months with any payment in the year before study enrollment ^a							
0%	39.6		43.1	35.2	44.4	46.3	41.5
1% - 25%	36.4		34.0	27.5	31.4	28.6	31.7
26% - 50%	16.8		14.4	22.6	15.6	15.7	17.1
51% - 75%	6.3		7.3	10.9	7.1	9.2	8.2
76% - 100%	1.0		1.1	3.8	1.4	0.3	1.6
Sample size	935	1,231	817	859	770	741	5,353

SOURCES: MDRC calculations based on child support administrative records and quarterly earnings data from the National Directory of New Hires.

NOTES: Sample sizes may vary because of missing values and gaps and delays in data.

Rounding may cause slight discrepancies in sums.

For detailed definitions of each covariate, please see Appendix B, Section II "Covariates."

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available.

^aExcludes California.

APPENDIX TABLE A.8 Baseline Characteristics of Noncustodial Parents in the PJAC Demonstration, by Site: Case Complexity

Characteristic (%)	Arizona	California	Michigan	Franklin County, Ohio	Stark County, Ohio	Virginia	All PJAC Sites
More than one open case	24.6	25.7	59.9	46.1	54.5	46.3	41.0
Oldest case is five years old or newer	40.0	35.6	20.6	39.6	24.7	29.7	32.3
Custodial parent and child(ren) on the primary case receiving Temporary Assistance for Needy Families	1.8	23.9	4.9	5.0	9.5	17.3	11.1
Has a debt-only case	27.7	20.2	33.2	20.9	37.9	45.3	30.9
Total child support debt owed							
\$0 - \$9,999	24.4	32.5	51.4	37.8	48.4	46.6	39.1
\$10,000 - \$29,999	32.5	33.3	29.9	40.3	33.5	29.3	33.2
\$30,000 - \$59,999	21.6	16.7	12.9	15.9	13.1	15.7	16.2
\$60,000 - \$89,999	9.5	7.4	3.5	4.2	4.0	4.7	5.8
\$90,000+	12.0	10.2	2.3	1.7	0.9	3.6	5.7
Ever referred to contempt	29.8	5.8	58.3	39.2	29.6	54.3	33.5
Sample size	935	1,231	817	859	770	741	5,353

SOURCES: MDRC calculations based on child support administrative records and quarterly earnings data from the National Directory of New Hires.

NOTES: Sample sizes may vary because of missing values and gaps and delays in data.

Rounding may cause slight discrepancies in sums.

For detailed definitions of each covariate, please see Appendix B, Section II, "Covariates."

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available.



APPENDIX B

Technical Appendix

This technical appendix is a supplement to the report *Who Benefits Most from Procedural Justice-Informed Alternatives to Contempt in the Child Support Program?* and provides methodological information on the exploratory analysis conducted for the report. It is organized into the following sections:

- I. Data Sources
- II. Covariates
- III. Outcomes
- IV. The Lasso Method
- V. Predicted Values

Section I: Data Sources

- **Child support administrative records.** These data were extracted from child support agency systems for all parents in the study sample and include information on parents' background and case characteristics, receipt of child support services, child support orders, and receipt of enforcement actions and civil contempt proceedings. While data are available from each of the six PJAC study sites, state systems vary, and information was not available from every site for every data element.
- **Procedural Justice-Informed Alternatives to Contempt (PJAC) management information system data.** These PJAC case management data document the rates and details of parent contacts, case conferences, case action plans, enhanced child support services, and referrals to supportive services for all PJAC services group members throughout PJAC implementation.
- **Employment and earnings records.** The research team used data from the National Directory of New Hires (NDNH) to measure quarterly employment and earnings. Maintained by the Office of Child Support Services, the NDNH contains data collected by state workforce agencies for jobs covered by unemployment insurance, as well as data on federal employees. These jobs include most formal employment, with some exceptions for independent contractor employment and self-employment.¹

¹ During the time periods covered in the NDNH data used in this analysis, only California and Ohio had requirements for the reporting of independent contractor employment (which may include gig employment and self-employment). For more information, see Office of Child Support Enforcement (1999); Office of Child Support Services (2024); California Code, Unemployment Insurance Code § 1088.8 (2001); Virginia New Hire Reporting Center (n.d.); Ohio Revised Code § 3121.891 (2013).

Section II: Covariates

Selecting Covariates for This Analysis

The research team created baseline variables, or covariates, that represent enrolled parents' characteristics, their case characteristics, and their recent histories with the child support program at the time of study enrollment. Prior analyses conducted for the PJAC demonstration used covariates to increase the statistical precision of impact estimates.² This analysis, however, explores how engagement and the impacts of PJAC vary by these covariates after taking into account the effects of all other covariates.

The covariates used in this optimal targeting analysis were selected from the covariates used for the PJAC impact analysis, which are outlined in the PJAC impact analysis plan.³ All covariates detailed in the PJAC impact analysis plan were included in this optimal targeting analysis with the following exceptions:

- Instead of the indicator “arrears-only primary case” (arrears are child support debt), the research team included the covariate “any debt-only cases at enrollment,” as the latter encompasses all of a parent’s open cases.
- Instead of the indicator “payment on any case in the year before random assignment,” the research team included the covariate “total amount paid in the year before enrollment” in this analysis to capture more detail on recent payments. The team opted to not include both variables to avoid introducing high correlation between covariates.
- “Had an interstate case at enrollment” was excluded from this analysis because interstate cases were very uncommon among parents enrolled in PJAC. At the time of study enrollment, only 3 percent of parents had interstate cases. To be eligible for PJAC, a parent must have an in-state case, so all parents with interstate cases also had in-state cases at the time of enrollment.
- “Family violence indicated on any case at enrollment” was excluded from this analysis because the covariate was unavailable for 26 percent of the sample, and the team determined that family violence should not be imputed, as the accuracy with which family violence could be predicted through imputation was limited.

Descriptive statistics for the baseline characteristics are presented in Appendix Tables A.1-A.8.

² Prior analyses conducted for the PJAC demonstration confirmed that the parents assigned to the PJAC services group and the parents assigned to the business-as-usual group were statistically equivalent with respect to nearly all measured baseline characteristics, as expected because individuals were randomly assigned to the two groups. See Skemer (2023) and Cummings (2020) for additional information on baseline characteristics.

³ The PJAC impact analysis plan is available online at <https://osf.io/w9jmb>.

Selected Covariates and Their Definitions

The following covariates were included in every model, unless otherwise noted. All continuous variables were categorized into ordinal series of binary (0/1) covariates, as listed in the covariate descriptions below, to allow the research team to calculate results that were easier to understand and translate into targeting recommendations that could be put into use. The research team considered the distribution of the continuous variables in tandem with conceptual factors to construct the categories.

Study Enrollment Information

- **Research group assignment** indicates whether a parent was randomly assigned to the PJAC services group (1) or the business-as-usual group (0). This covariate allows the research team to measure the impacts of the PJAC intervention. This covariate was not included in models evaluated for research question 1, because the sample for research question 1 only includes parents assigned to the PJAC services group.
- **Random assignment quarter** is the quarter during which a parent was enrolled and randomly assigned to a research group in the PJAC demonstration. Including random assignment quarter allows the research team to control for contextual factors that may vary over the course of a year and over time from the launch of PJAC. For this analysis, random assignment quarter is expressed as six binary (0/1) variables, each indicating one calendar quarter from quarter 1 of 2018 to quarter 2 of 2019.⁴
- **Site** is the child support agency location in which the parent was enrolled in PJAC as a non-custodial parent. Inclusion of site in the analysis allows the research team to adjust for differences in conditions across sites, such as implementation and staffing differences, that cannot be explained by other baseline characteristics. Site is expressed as a set of six binary (0/1) covariates, one for each of the six PJAC sites: Arizona, California, Michigan, Franklin County in Ohio, Stark County in Ohio, and Virginia.

Parent Demographics

Demographic information is included in this analysis, as is typical in social policy analysis, because it allows the research team to measure and control for how different parents experience and respond to the PJAC intervention, as well as to control for social and economic barriers that populations face in attaining resources that may promote or inhibit their ability to meet their child support obligations.

- **Female** indicates whether the parent is female (1) or male (0). The research team created this covariate using data reported by the child support agencies. The agencies classified partici-

⁴ This analysis includes parents who enrolled in PJAC between February 1, 2018, and April 30, 2019. Therefore, quarter one of 2018 only includes parents who enrolled in February and March 2018, and quarter two of 2019 only includes parents who enrolled in April 2019.

pants as “male” or “female” (other sexes and gender identities were not captured in the data), and agencies varied in whether they named this information “sex” or “gender.”

- **Race and ethnicity** are represented through four mutually exclusive, binary (0/1) covariates: Hispanic, non-Hispanic Black, non-Hispanic White, and Other Race and Ethnicity. The research team created this covariate using various race and ethnicity data reported by the participating child support agencies. The “Other Race and Ethnicity” category comprises a variety of racial and ethnic identities, including Asian, Native American/American Indian, Pacific Islander, Caribbean, and multiracial.
- **Age** of the parent is categorized into four binary (0/1) covariates for the following age ranges: 18-29, 30-39, 40-54, and 55 and older. These categories were selected after a review of the spread of ages across the sample; the research team constructed categories that were multiples of fives that sufficiently subdivided the sample.

Recent Earnings, Payments, and Order Amounts

- **Amount earned in the formal economy in the year before enrollment** is categorized into six binary (0/1) variables for the following income ranges: \$0 (no earnings), \$0.01 to \$2,499.99, \$2,500.00 to \$9,999.99, \$10,000.00 to \$19,999.99, \$20,000.00 to \$29,999.99, and \$30,000.00 or more. The research team divided earnings into multiples of \$10,000 but split the first \$10,000 into two categories because a large proportion of parents fell into the category. Including earnings covariates enables the research team to measure the association between access to financial resources earned through formal employment and the outcomes.
- **Total monthly amount due at the time of enrollment** is the sum of all a parent’s monthly child support order amounts, including current support orders and orders on child support debts (the amount a parent is expected to pay down in debts each month), during the month of enrollment. Due to data limitations, in Arizona and Virginia the total monthly amount due does not include orders on child support debts; this component of monthly child support order amounts is included for all other sites. Total monthly amount due allows the research team to assess how a parent’s financial obligations to child support may be related to outcomes. Additionally, order amounts are a proxy for a parent’s access to financial resources, as child support programs must consider a parent’s finances, among other information, when setting order amounts.⁵ Total monthly amount owed is expressed as a series of four binary (0/1) variables for the following total monthly obligation amount ranges: \$0.00 to \$249.99, \$250 to \$499.99, \$500.00 to \$749.99, and \$750.00 or more. These categories, which are in intervals of \$250, were determined from an examination of the spread of the monthly amounts due.

⁵ Office of Child Support Enforcement (2017).

- **Total amount paid to child support in the year before enrollment** includes all payments the parent made toward current support and debt. This covariate is one of three measuring parents' payments in the year before enrollment. Total amount paid to child support does not account for a parent's obligations or payment regularity. Total child support amount paid is expressed as a series of four binary (0/1) variables representing the following payment amount ranges: \$0 (no payment), \$0.01 to \$999.99, \$1,000.00 to \$2,999.99, and \$3,000 or more. These categories, which are in intervals of \$1,000, were determined from an examination of the spread of amounts paid.
- **Proportion of child support obligation paid in the year before enrollment** is a function of the total amount paid in the year before enrollment divided by the total order amounts owed in the year before enrollment. This characteristic is expressed as a series of eight binary (0/1) covariates representing the following ranges of proportion paid: 0 percent (no payment), 1 percent to 9 percent, 10 percent to 19 percent, 20 percent to 29 percent, 30 percent to 39 percent, 40 percent to 49 percent, 50 percent to 99 percent, and 100 percent.⁶ These categories, which are mostly multiples of 10 percent, were determined by examining the spread of compliance rates. The research team selected narrower ranges because they lend to easier and more discrete interpretation. This covariate was not created for California because data on historical orders before enrollment were not available in California. This covariate is the second of three measuring recent payments. Unlike total amount paid, this payment covariate accounts for the parent's obligation amount. It should be noted that this measure of overall compliance differs somewhat from the measure that is typically used by the child support program. The standard child support measure focuses on current support on a monthly basis and is intended to reflect reliability. To illustrate, the covariate used in this analysis treats a one-time payment of \$1,200 on a \$100 monthly current support order the same as 12 monthly payments of \$100 per month over a one-year period. The child support program measure considers the first case to have 8 percent compliance (1 month of compliance in 12 months, thus 1 divided by 12) and the second to have 100 percent compliance. Moreover, the child support program measure's compliance-rate calculations often exclude orders on debt.
- **Proportion of months with any payment in the year before enrollment** is the number of months during which a parent made a payment divided by the number of months during which the parent had any open cases. This proportion is expressed as a series of five binary (0/1) variables representing the following ranges of proportions: 0 percent (no payment), 1 percent to 25 percent, 26 percent to 50 percent, 51 percent to 75 percent, and 76 percent to

⁶ To construct this measure, the research team had to address data gaps at a few sites. In Arizona, information on monthly orders on child support debt was unavailable for almost all parents. Where data were available, the median order on debt was \$50, so \$50 was added to the calculation of monthly obligations in all months during which a case had a positive debt balance. In Virginia, like Arizona, information on monthly obligations on child support debt was unavailable. According to the Virginia Division of Child Support Enforcement, the regulatory minimum order on debt is \$65 for an administrative child support order; this regulatory minimum also applies to judicial orders, though a court may deviate from this amount. In lieu of a better proxy, \$65 was added to the monthly calculation of orders for all cases with child support debt. Various sensitivity checks were conducted to see whether different assumptions would have affected the final results; there is little evidence to suggest they would have.

100 percent. These categories, which are intervals of 25 percent, were determined after an examination of the spread of payment regularity. Note that this covariate was not available in California because data on historical orders before enrollment were not available in California. This is the third and final covariate measuring recent payments. Proportion of months with any payment in the previous year allows the research team to investigate the effects of a parent's payment regularity but not the amount or proportion of obligation paid in those payments.

Complexity of Child Support Cases

Each of these measures only includes cases for which the enrolled parent is the noncustodial parent (as opposed to cases for which the enrolled parent is the custodial parent or child).

- **Multiple cases** (0/1) indicates whether the parent had more than one case open at enrollment, including current support cases and debt-only cases. If a parent had more than one open case, that parent probably had a separate child support order for each case. This covariate is one way the research team gauged the breadth of a parent's involvement with the child support agency.
- **Years since the establishment of a parent's oldest case** is expressed as a binary (0/1) variable indicating whether the parent's oldest open case was established five years or fewer (1) or at least six years (0) before the time of enrollment. This covariate allows the research team to measure how length of involvement with the child support program may be related to outcomes and impacts of PJAC.
- **Custodial parent and child(ren) on primary case were receiving Temporary Assistance for Needy Families (TANF) benefits** (0/1) at the time of enrollment. A noncustodial parent's primary case is the case that made the parent eligible for contempt and the PJAC demonstration. The research team included this covariate for two reasons. First, TANF receipt is often a poverty indicator. Second, to receive TANF benefits, the custodial parent typically must hand off the case to the state or establish a child support case if one does not already exist.⁷ Because the state is now in charge of the case, it may have a greater incentive to recover money on cases with significant state-owed child support debt, and that incentive may change caseworkers' approach to enforcement and services. Caseworkers may be motivated to help families become self-sufficient and may therefore make enforcement and service decisions differently. Additionally, establishing a child support case may cause increased strain on the relationship between the noncustodial parent and custodial parent (and perhaps on the relationship between noncustodial parent and child(ren)), and it may indirectly affect any informal support a noncustodial parent was already providing to the child(ren).⁸

⁷ Center on Budget and Policy Priorities (2022); Falk (2023).

⁸ Buitrago et al. (2022).

- **Any debt-only cases** (0/1) indicates whether a parent had any case at the time of enrollment for which there was no longer a current child support order but for which the parent had unpaid child support debt accrued from past-due support. Parents can accrue debt if they do not meet their current support obligations to custodial parents or the state. If a parent has a debt-only case, that parent may have to make monthly payments toward that debt to the custodial parent or the state, or any interest owed on the debts to those parties. The research team included this covariate for two reasons: first, child support debt can serve as a proxy for a parent's long-term payment history with the child support agency. Second, past PJAC research indicates that parents with debt-only cases may be harder to engage, as their children are typically now adults. Including this covariate allows the research team to investigate whether such parents have different levels of engagement and impacts on payments than other parents.
- **Total child support debt owed across all cases at the time of enrollment** is categorized into five binary (0/1) variables for the following ranges of debt: \$0.00 to \$9,999.99, \$10,000.00 to \$29,999.99, \$30,000.00 to \$59,999.99, \$60,000.00 to \$89,999.99, and \$90,000.00 or more. The research team categorized debt balances into multiples of \$30,000 but split the first \$30,000 into two categories because a large proportion of parents fell into the category. Unlike the measures of recent payments, total child support debt reflects a longer span of a parent's payment history. While this measure does not directly indicate how a parent accumulated debt, it is likely that parents with very high balances missed payments or made incomplete payments for many years, while parents with low balances accumulated their debt over a shorter period.
- **Ever referred to contempt** (0/1) indicates whether the parent has any past contempt referrals on any open or closed cases. This predictor allows the research team to explore whether past contempt referrals are related to parents' outcomes under the PJAC intervention.

Missingness and Imputation

As noted, the research team considered how much data was missing when selecting covariates for this exploratory analysis. The team used the following methods to address any remaining missing data among the selected covariates before running the analysis models:

- Race and ethnicity information was unavailable for 275 parents out of the sample of 5,628. Parents missing race and ethnicity information were excluded from all models using list-wise deletion.
- Some continuous variables were missing for some parents in the sample, as noted below. Before dividing the continuous variables into series of binary covariates, the research team used single stochastic imputation to impute missing values. The single stochastic imputation predicted values using a linear formula that could yield imputed values outside of what is logically feasible. For example, a value of -1 could be imputed for the covariate "years since

establishment of a parent's oldest case," which is impossible. To address this possibility, the research team determined a range of possible values informed by the existing minimum and maximum values for each continuous variable, and after imputation, any imputed values outside that range were forced to either the maximum or minimum, whichever was closer.

- Years since establishment of oldest case was missing for 8 of 5,628 parents.
- Total child support debt owed was missing for 1 of 5,628 parents.
- Total monthly amount due across all cases was missing for 2 of 5,628 parents.
- Total amount paid to child support was missing for 3 of 5,628 parents.
- Amount earned in the formal economy was missing for 60 of 5,628 parents.
- Debt-only status was unavailable for 1,169 of 5,628 parents. This indicator covariate was imputed using logistic regression.
- Proportion of child support obligation met and proportion of months with any payment were unavailable in California, as discussed. The research team configured the analysis model to account for this issue, as described in more detail in Section IV, "The Lasso Method."

Section III: Outcomes

To evaluate optimal targeting of PJAC services, the research team selected a limited set of outcomes from those analyzed and reported on in past reports.

Research Question 1: Engagement

To answer research question 1, the research team evaluated the relationship between the covariates and the following outcomes for a one-year period starting from the date of random assignment:

- Case manager had a successful contact with the noncustodial parent (0/1)
- Number of successful contacts case manager had with the noncustodial parent
- Had a case conference with case manager and custodial parent (0/1)
- Created a case action plan with case manager (0/1)

For more detailed definitions of these outcomes, please see the PJAC implementation research analysis plan.⁹

There are no comparable engagement services or data available for parents in the business-as-usual group. These services were typically only offered to parents in the PJAC services group, as they were a part of the PJAC service model, and there was no equivalent business-as-usual offering for most of

⁹ The PJAC implementation research analysis plan is available online at <https://osf.io/c2jbx>.

these services. Data on these engagement services were only available through the PJAC management information system, which only collected information for parents enrolled in the PJAC services group. Therefore, each of the models evaluating the engagement outcomes includes only parents in the PJAC services group. Any results from the engagement outcome models are *not* impacts, because research group assignment is not a covariate in the models. All results for these outcomes should also be considered exploratory, as is the nature of this optimal targeting analysis.

Research Question 2: Service Receipt and Payments

To evaluate research question 2, the research team evaluated the relationship between the covariates and impacts on the following outcomes. Unless otherwise specified, each of these outcomes reflects activities across a 12-calendar-month follow-up period starting from the beginning of the month of random assignment.

- Child support services:
 - Had a case closure (0/1)
 - Received an order modification (0/1)
- Enforcement and contempt actions:
 - License suspended (0/1)¹⁰
 - Civil contempt of court filed for failure to comply with a child support court order (0/1)
 - Issued a bench warrant (0/1)
- Child support payments and debt:
 - Proportion of monthly child support obligation paid (%)¹¹
 - Proportion of months with any payment (%)
 - Total amount paid (\$)
 - Total child support debt owed across all cases in the final month of the follow-up period (\$)

For more detailed definitions of these outcomes, please see the PJAC impact analysis plan.¹²

¹⁰ This outcome excludes Arizona due to data limitations.

¹¹ To construct this measure, the research team had to address data gaps at a few sites. In Arizona, information on monthly obligations for child support debt was unavailable for almost all parents. Where data were available, the median order on debt was \$50, so \$50 was added to the calculation of monthly obligations in all months during which a case had a positive debt balance. In California, the team did not receive monthly obligation information in all months due to delays in initial file delivery and minor data issues. Where there were gaps, the research team filled them using information provided at study enrollment via the PJAC management information system and obligation amounts from adjacent months in child support administrative records. In Virginia, like Arizona, information on monthly obligations for child support debt was unavailable. According to the Virginia Division of Child Support Enforcement, the regulatory minimum order on debt is \$65 for an administrative child support order; this regulatory minimum also applies to judicial orders, though a court may deviate from this amount. In lieu of a better proxy, \$65 was added to the monthly calculation of orders for all cases with debts. Various sensitivity checks were conducted to see whether different assumptions would have affected the final results; there is little evidence to suggest they would have.

¹² As mentioned above, the PJAC impact analysis plan is available online at <https://osf.io/w9jmb>.

These outcomes are available for parents in both the PJAC services and business-as-usual groups and were created using administrative child support data. The results for research question 2 show which characteristics are associated with greater impacts of the PJAC intervention on each outcome, controlling for the effects of other parent and case characteristics.

Section IV: The Lasso Method

What Is the Lasso?

The goal of this exploratory, optimal targeting analysis is to identify from many characteristics those that predict the best engagement and impacts of PJAC on service receipt, enforcement, payments, and debt. To achieve this goal, the research team conducted least absolute shrinkage and selection operator, known as the lasso. The lasso is a multivariate regression method that selects the covariates that best predict the outcome and estimates the size of the effect of each selected covariate on the outcome. The lasso does so with the help of a “penalty” term, which helps the model both kick out statistically irrelevant variables and better estimate coefficients.¹³

The statistical analysis described in this report was performed using the glmnet package in R.¹⁴

Modeling Iterations

The research team constructed multiple models to evaluate the relationship of the selected covariates with engagement outcomes and impacts on service receipt, enforcement, payments, and debt. The word “model” as used in this appendix refers to a unique lasso regression configuration, with a single outcome, set of covariates, and specifications. Appendix Figure B.1 displays the different iterations of specifications employed to create the different models for an outcome by research question. The research team evaluated multiple models for each outcome for two reasons: (1) because some data were not available in California; and (2) to test the robustness of results to different model specifications. Models used one of two site configurations (shown in the second row in Appendix Figure B.1) and one of two or three interaction types (shown in the third row of Appendix Figure B.1).

For parents in California, historical data were not available on order amounts, so the following two covariates could not be created for California: (1) proportion of child support obligation paid in the year before enrollment and (2) proportion of months with any payment in the year before enrollment. These are the only covariates measuring payment compliance and regularity, and the research team thought it was important to evaluate the relationship of these predictors with the engagement outcomes and impacts. To navigate this issue, the research team estimated each model once with all sites

¹³ Tibshirani (1996); Columbia University Mailman School of Public Health (n.d.).

¹⁴ For more information on this package, see Hastie, Qian, and Tay (2023).

(but excluding the two covariates) and once without California (but including all covariates). These decisions are reflected in Appendix Figure B.1.

Interaction terms were used in the analyses of both research question 1 and research question 2. Interaction terms can reveal circumstances where the effects of two characteristics together are different from the sum of their individual effects. For example, female parents may be X percent more likely to have an order modification than male parents, and young parents may be Y percent more likely to have an order modification than old parents, but the effect for young female parents might be different from X plus Y.

For research question 1, the research team ran one set of models with no interactions and a second set that was fully interacted (see the third row of Appendix Figure B.1). For research question 1, “fully” interacted means the model included all pairwise interactions between covariates, in addition to the noninteracted covariates. For example, if a noninteracted model included only two covariates, female and age, the fully interacted model would include an interaction of female and age as well as the covariate for female and the covariate for age.

For research question 2, the research team ran models with three different types of interactions (as shown in the third row of Appendix Figure B.1): no interactions, research group (RA)-interacted, and fully interacted. The RA-interacted models include pairwise interactions between each covariate and an indicator of whether the individual was assigned to the PJAC group or the business-as-usual group (RA value), in addition to the noninteracted covariates. Building on the example of a noninteracted model that includes only female and age covariates, an RA-interacted model would include an interaction between female and RA value, an interaction between age and RA value, the covariate for female, the covariate for age, and the covariate for RA value. The purpose of these interactions is to estimate the relationship of one characteristic with the impacts of PJAC while holding constant the relationships of other characteristics with the impact of PJAC. The fully interacted models for research question 2 include the noninteracted covariates and all pairwise interactions between covariates, including RA value.

In total, the research team evaluated four models for each outcome for research question 1: a noninteracted model and a fully interacted model each evaluated with California parents and without California parents. For research question 2, the team evaluated six models for each outcome: a noninteracted model, an RA-interacted model, and a fully interacted model each evaluated with California parents and without California parents. In all models evaluated for this exploratory analysis, the research team estimated outcomes and impacts while holding all other covariates constant, including covariates that may be part of the same categorical construct.

In the optimal targeting report and in Appendixes C, D, and E, however, the research team only discusses and presents results from research question 1’s noninteracted models and research question 2’s RA-interacted models. For results from any models not included in Appendixes C, D, and E, please email Jennifer.Hausler@mdrc.org or Charles.Michalopoulos@mdrc.org.

Calculating the Penalty Term

As noted earlier in this section, the lasso uses a penalty term to determine which covariates have little predictive power and thus should be kicked out of the model. This penalty term must be chosen before the lasso regression can be estimated. The study team calculated the penalty term for each model by first dividing the data into five random subsets. Starting with the first subset, test models were created with varying penalty-term values. The test models were then evaluated on the sample that fell outside of that subset, and each test model's error (a measure of how well the test model predicts the outcome) was recorded. This process was repeated for the other four subsets using the same varying penalty-term values to create the test models. The errors were averaged across the five subsets by penalty-term value, and the penalty-term value that had the lowest average error was selected for use in the corresponding lasso model.¹⁵

In this analysis, the sample used to choose the penalty term differed for research questions 1 and 2. Since answering research question 1 uses data only available for the PJAC services group, as described in more detail in the “Outcomes” section, the penalty term was estimated using only the PJAC services group. In contrast, answering research question 2 uses data on both research groups. However, using data from both research groups to choose the penalty term for the research question 2 models could bias the penalty term—in effect, pretuning the term to account for the effects of the demonstration. Thus, for research question 2, the research team calculated the penalty terms using only the business-as-usual group.

Standardization

In estimating the lasso models, all covariates and outcomes were standardized using unit variance standardization, meaning the covariates were adjusted to have a mean of zero and a variance of one. The models were evaluated with the standardized covariates and outcomes, and any resulting regression coefficients were then destandardized so that results are expressed in the natural units of the outcome and covariates, such as percentage points or dollar amounts.

Section V: Predicted Values

What Are Predicted Values?

A feature of lasso is that it enhances the accuracy of predictions made by a model.¹⁶ The report therefore used results of the lasso to predict engagement rates and impacts of PJAC for a set of profiles described in the subsequent subsection. The predicted values for research question 1 outcomes were calculated using the noninteracted lasso results, and the predicted impact values (the difference be-

¹⁵ Hastie, Qian, and Tay (2023); Friedman et al. (2023); Schneider (1997).

¹⁶ Lee, Shi, and Gao (2022).

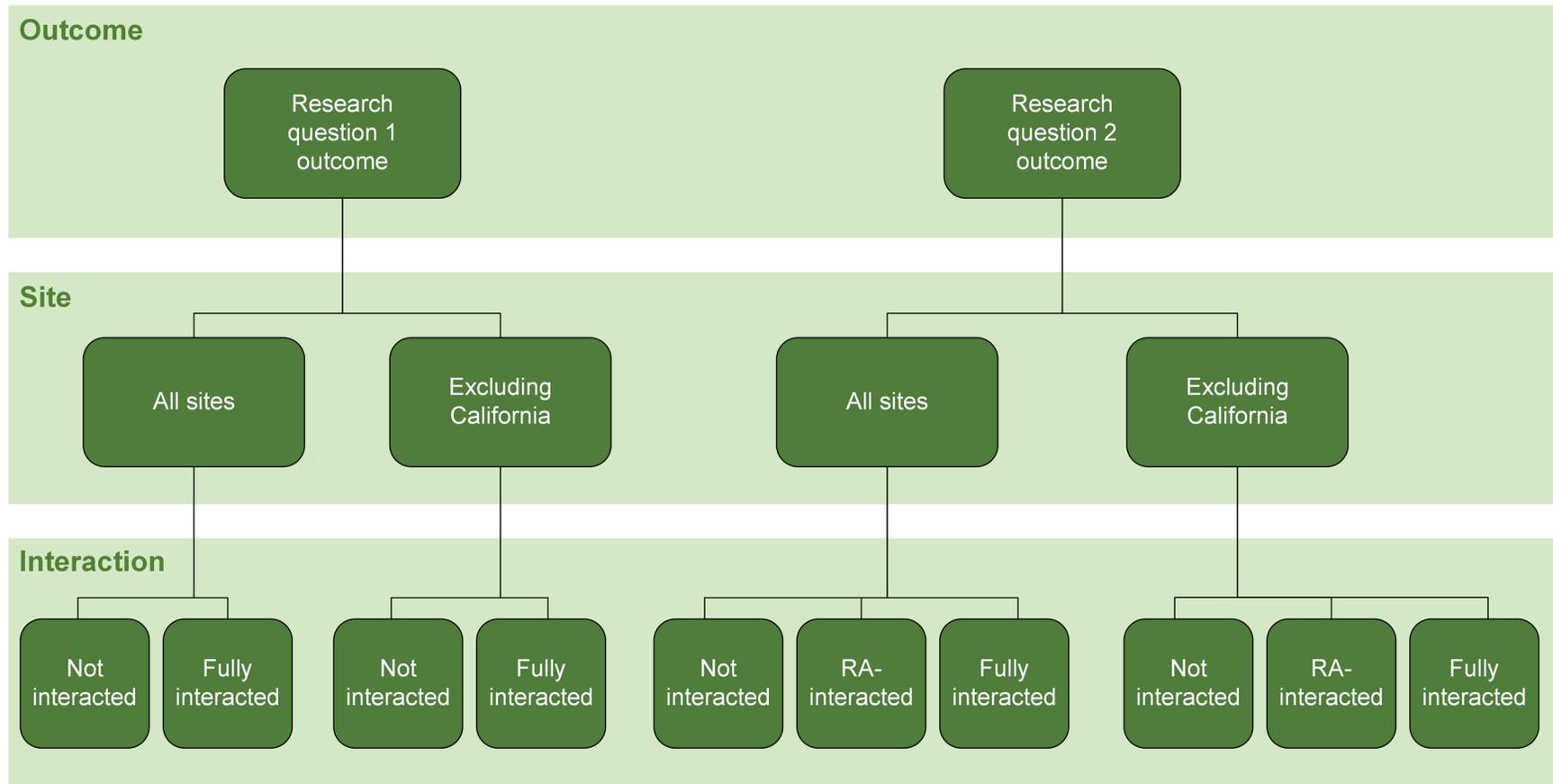
tween predicted values for the PJAC services group and the business-as-usual group) for research question 2 outcomes were calculated using the RA-interacted lasso results. The predicted values allow the research team to estimate rates of engagement and impacts on service receipt, enforcement actions, payments, and debt for parents with characteristics identified for optimal targeting of PJAC services, as described in the “Results” and “Discussion” sections of the main report.

Constructing Profiles

The research team created three parent profiles that allowed the team to explore how much outcomes and impacts vary between a parent who has characteristics associated with better engagement and more positive impacts and a parent who has none of those characteristics. One profile represents an individual with characteristics that had high associations with the measured outcomes and impacts. A second profile represents an individual with characteristics that had low association with outcomes and impacts. The third profile falls in between those two.

The characteristics were determined using the results of the lasso analysis. Appendix Table B.1 details the characteristics applied in each profile. Any covariates excluded from this table were set to the same value for each profile.

APPENDIX FIGURE B.1 Lasso Model Iterations



APPENDIX TABLE B.1 Predicted Value Profiles

Characteristic	Profiles Reflecting Association with Optimal Outcomes and Impacts		
	Profile 1: High Association	Profile 2: Medium Association	Profile 3: Low Association
Years since establishment of oldest case	0-5 years	6 or more years	6 or more years
Ever referred to contempt	No	No	Yes
Any debt-only cases	No	No	Yes
Amount earned in the formal economy	\$30,000 or more	\$2,500 - \$9,999	\$0
Total amount paid to child support	\$3,000 or more	\$0.01 - \$999	\$0
Total child support debt	\$0 - \$9,999	\$30,000 - \$59,999	\$90,000 or more
Proportion of child support obligation paid	40% - 49%	10% - 19%	0
Proportion of months with any payment	76% - 100%	26% - 50%	0



APPENDIX C

Regression Results for the
Noninteracted Models
Evaluated to Answer Research
Question 1

How to Read the Lasso Results Tables in Appendix C

The results tables in Appendix C use the format shown in the excerpts below (taken from Appendix Tables C.1 and C.2). The excerpt from Appendix Table C.1 shows the lasso regression coefficients for the female covariate, race and ethnicity covariates, and the age covariates for the outcome “Case manager had a successful contact with the noncustodial parent” across all sites (the nonitalicized row) and excluding parents from California (the italicized row). The excerpt from Appendix Table C.2 shows the lasso regression coefficients for formal earnings covariates for the same outcome “Case manager had a successful contact with the noncustodial parent” across all sites (the nonitalicized row) and excluding parents from California (the italicized row). As a reminder, all research question 1 models include only parents in the PJAC services group.

APPENDIX TABLE C.1 Research Question 1 Results: Coefficients on Covariates Representing Parent Demographics (Excerpt)

Outcome	Covariates						
	Female	Race and Ethnicity (Reference Group = Black, non-Hispanic)			Age (Reference Group = 30 to 39)		
		White, non-Hispanic	Hispanic	Other	18-29	40-54	55 and older
Case manager had a successful contact with the noncustodial parent	0.055	-0.018	-0.033	-0.067		-0.012	0.022
<i>Excluding California</i>	<i>0.020</i>		<i>-0.013</i>	<i>-0.033</i>			

APPENDIX TABLE C.2 Research Question 1 Results: Coefficients on Covariates Representing Parents’ Formal Earnings (Excerpt)

Outcome	Covariates				
	Total Formal Earnings in the Year Before Study Enrollment (Reference Group = \$0)				
	\$0.01 - \$2,499	\$2,500 - \$9,999	\$10,000 - \$19,999	\$20,000 - \$29,999	\$30,000 or more
Case manager had a successful contact with the noncustodial parent		-0.026	-0.053	-0.023	-0.037
<i>Excluding California</i>			<i>-0.009</i>		

Each row in an Appendix C table represents a unique noninteracted model, and the values within a row are the resulting regression coefficients for the given covariates (indicated by the column title) for that lasso model. The coefficients listed in an outcome’s row across all Appendix C tables together constitute the results for that model (though Appendix Table C.6 shows results only from models

that exclude California). For example, the results in the row “Case manager had a successful contact with the noncustodial parent” in Appendix Tables C.1 through C.5 together make up the results of the all-site noninteracted model measuring the effects of parents’ characteristics on the outcome “Case manager had a successful contact with the noncustodial parent.” The results in the next row with the label “Excluding California” in Appendix Tables C.1 through C.5 together with the results in the row with the italicized label “Case manager had a successful contact with the noncustodial parent” in Appendix Table C.6 make up the results of the noninteracted model measuring the effects of parents’ characteristics on the outcome “Case manager had a successful contact with the noncustodial parent” across all sites *except* California.

All covariates analyzed in this report are binary variables, meaning a person either has or does not have the attribute described by the covariate. All parent characteristics are represented by at least two categories. For a given characteristic, the number of covariates is equal to one less than the total number of categories the characteristic comprises, because one category must be used as the point of reference, or the reference group. The regression coefficient should be interpreted as the difference in the outcome for having the covariate attribute relative to the reference group. In the case of characteristics with only two categories, the reference group can also be interpreted as not having the covariate attribute. For example, the characteristic “female” comprises the two categories “female” and “not female” (in this case, “not female” is the same as “male”), and the characteristic is represented by the covariate “female.” Per the excerpt from Appendix Table C.1, a female parent is 5.5 percentage points more likely to have a successful contact with a case manager than a male parent, across all PJAC sites, all other covariates held constant. Meanwhile, the characteristic “race and ethnicity” includes the four categories “Black, non-Hispanic,” “White, non-Hispanic,” “Hispanic,” and “Other Race or Ethnicity.” “Black, non-Hispanic” was selected as the reference group, and the latter three categories were included as covariates. Per the excerpt from Appendix Table C.1, if a parent’s race and ethnicity is non-Hispanic White, that parent is 1.8 percentage points less likely than a non-Hispanic Black parent to have a successful contact.

If no coefficient value is listed for a covariate, the lasso kicked out that covariate, indicating that the lasso determined that the covariate was not sufficiently related to the outcome. When a covariate is kicked out, the effect of that covariate on the outcome is assumed to be no different from the effect of the reference group on that outcome. Per the extract from Appendix Table C.2, excluding California, parents who earned less than \$2,500 or at least \$10,000 were no more or less likely to have a successful contact than parents with no formal earnings, all other covariates held constant.

APPENDIX TABLE C.1 Research Question 1 Results: Coefficients on Covariates Representing Parent Demographics

Outcome	Covariates						
	Female	Race and Ethnicity (Reference Group = Black, non-Hispanic)			Age (Reference Group = 30 to 39)		
		White, non-Hispanic	Hispanic	Other	18-29	40-54	55 and older
Case manager had a successful contact with the noncustodial parent	0.055	-0.018	-0.033	-0.067		-0.012	0.022
<i>Excluding California</i>	<i>0.020</i>		<i>-0.013</i>	<i>-0.033</i>			
Number of successful contacts case manager had with the noncustodial parent	0.607	-0.256	-0.419		0.022		0.160
<i>Excluding California</i>	<i>0.696</i>	<i>-0.213</i>	<i>-0.250</i>				<i>0.230</i>
Case conference with case manager and custodial parent occurred		-0.007	-0.011	-0.021	-0.005	-0.023	-0.018
<i>Excluding California</i>						<i>-0.010</i>	<i>-0.007</i>
Case action plan created with case manager	0.051	-0.041	-0.035	-0.022	-0.030	-0.014	0.014
<i>Excluding California</i>	<i>0.057</i>	<i>-0.032</i>	<i>-0.035</i>	<i>-0.060</i>	<i>-0.019</i>	<i>-0.005</i>	

SOURCES: MDRC calculations based on child support administrative data, PJAC management information system data, and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled “Excluding California” were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

“Reference Group” indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled and randomly assigned to the PJAC services group from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 606, California = 798, Franklin County = 558, Michigan = 529, Stark County = 499, Virginia = 484.

APPENDIX TABLE C.2 Research Question 1 Results: Coefficients on Covariates Representing Parents’ Formal Earnings

Outcome	Covariates				
	Total Formal Earnings in the Year Before Study Enrollment (Reference Group = \$0)				
	\$0.01 - \$2,499	\$2,500 - \$9,999	\$10,000 - \$19,999	\$20,000 - \$29,999	\$30,000 or more
Case manager had a successful contact with the noncustodial parent	-0.026	-0.053	-0.023	-0.037	
<i>Excluding California</i>		-0.009			
Number of successful contacts case manager had with the noncustodial parent	-0.041	-0.327	0.032	-0.684	0.396
<i>Excluding California</i>		-0.185		-0.670	0.337
Case conference with case manager and custodial parent occurred	-0.030	-0.033	-0.013	-0.042	0.034
<i>Excluding California</i>	-0.021	-0.011		-0.012	0.015
Case action plan created with case manager	-0.046	-0.034	0.007	-0.055	0.010
<i>Excluding California</i>	-0.021	-0.004	0.014		

SOURCES: MDRC calculations based on child support administrative data, PJAC management information system data, and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled “Excluding California” were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

“Reference Group” indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled and randomly assigned to the PJAC services group from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 606, California = 798, Franklin County = 558, Michigan = 529, Stark County = 499, Virginia = 484.

APPENDIX TABLE C.3 Research Question 1 Results: Coefficients on Covariates Representing Study Enrollment Information

Outcome	Covariates									
	Quarter of Random Assignment (Reference Group = 2018 Q1) ^a					Site (Reference Group = Franklin County)				
	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	Arizona	California	Michigan	Stark County	Virginia
Case manager had a successful contact with the noncustodial parent	0.008	-0.055	-0.046	-0.029		-0.085	-0.131	-0.033	0.019	-0.023
<i>Excluding California</i>	<i>0.045</i>	<i>-0.013</i>	<i>-0.001</i>			<i>-0.076</i>	<i>NA</i>	<i>-0.019</i>	<i>0.013</i>	
Number of successful contacts case manager had with the noncustodial parent		-0.921	-0.823	-0.687	-0.780	-0.937	-1.186	-0.755	1.231	-0.202
<i>Excluding California</i>		<i>-1.231</i>	<i>-1.052</i>	<i>-1.130</i>	<i>-1.227</i>	<i>-0.940</i>	<i>NA</i>	<i>-0.620</i>	<i>1.271</i>	
Case conference with case manager and custodial parent occurred		-0.035	-0.017	-0.017	0.000	0.336			0.167	0.231
<i>Excluding California</i>		<i>-0.024</i>	<i>-0.005</i>	<i>-0.013</i>		<i>0.312</i>	<i>NA</i>	<i>-0.004</i>	<i>0.146</i>	<i>0.212</i>
Case action plan created with case manager	-0.027	-0.108	-0.126	-0.118	-0.082	-0.015	-0.165	-0.060	0.055	-0.040
<i>Excluding California</i>		<i>-0.115</i>	<i>-0.125</i>	<i>-0.134</i>	<i>-0.069</i>	<i>-0.000</i>	<i>NA</i>	<i>-0.045</i>	<i>0.060</i>	<i>-0.016</i>

SOURCES: MDRC calculations based on child support administrative data, PJAC management information system data, and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled “Excluding California” were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

“Reference Group” indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

“NA” denotes that the covariate was not included in the model.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled and randomly assigned to the PJAC services group from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 606, California = 798, Franklin County = 558, Michigan = 529, Stark County = 499, Virginia = 484.

^aVirginia began enrollment in June (quarter 2) 2018. 2018 quarter 1 only includes parents who enrolled in February and March 2018, and 2019 quarter 2 only includes parents who enrolled in April 2019.

APPENDIX TABLE C.4 Research Question 1 Results: Coefficients on Covariates Representing Case Characteristics

Outcome	Covariates						
	Oldest Case 5 Years Old or Less	Custodial Parent and Child(ren) Receiving TANF	Has a Debt-Only Case	More Than One Open Case	Monthly Amount Due (Reference Group = \$250 to \$499)		
					\$0-\$249	\$500-\$749	\$750 or more
Case manager had a successful contact with the noncustodial parent	0.023	-0.036	-0.046		-0.014		0.002
<i>Excluding California</i>	<i>0.010</i>	<i>-0.034</i>	<i>-0.043</i>				
Number of successful contacts case manager had with the noncustodial parent	0.171	-0.119	-0.211	-0.061	-0.622	0.122	0.465
<i>Excluding California</i>	<i>0.115</i>	<i>-0.338</i>	<i>-0.320</i>	<i>-0.040</i>	<i>-0.647</i>	<i>0.036</i>	<i>0.496</i>
Case conference with case manager and custodial parent occurred	0.028	-0.027	-0.035	-0.046	-0.021	0.047	0.031
<i>Excluding California</i>	<i>0.024</i>	<i>-0.032</i>	<i>-0.038</i>	<i>-0.048</i>	<i>-0.016</i>	<i>0.042</i>	
Case action plan created with case manager	0.013	-0.030	-0.005	-0.013	-0.039	0.003	0.043
<i>Excluding California</i>		<i>-0.049</i>	<i>-0.011</i>	<i>-0.011</i>	<i>-0.033</i>		<i>0.039</i>

SOURCES: MDRC calculations based on child support administrative data, PJAC management information system data, and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled “Excluding California” were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

“Reference Group” indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

TANF = Temporary Assistance for Needy Families.

The sample includes noncustodial parents enrolled and randomly assigned to the PJAC services group from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 606, California = 798, Franklin County = 558, Michigan = 529, Stark County = 499, Virginia = 484.

APPENDIX TABLE C.5 Research Question 1 Results: Coefficients on Covariates Representing Contempt, Payments, and Debt

Outcome	Ever Referred to Contempt	Covariates						
		Total Amount Paid in the Year Before Study Enrollment (Reference Group = \$0)			Total Child Support Debt Owed (Reference Group = \$0 to \$9,999)			
		\$0.01 - \$999	\$1,000 - \$2,999	\$3,000 or more	\$10,000 - \$29,000	\$30,000 - \$59,999	\$60,000 - \$89,999	\$90,000 or more
Case manager had a successful contact with the noncustodial parent		0.144	0.144	0.172	-0.004	-0.012	-0.022	-0.050
<i>Excluding California</i>		0.117	0.110	0.144		-0.003	-0.015	
Number of successful contacts case manager had with the noncustodial parent	-0.031	0.846	1.028	1.389			-0.267	-0.331
<i>Excluding California</i>	-0.055	0.685	0.792	1.276	0.027		-0.390	-0.030
Case conference with case manager and custodial parent occurred		0.059	0.046	0.071	0.003	-0.012	-0.007	
<i>Excluding California</i>		0.009	0.006	0.027		-0.007		
Case action plan created with case manager	0.004	0.149	0.182	0.166	-0.038	-0.070	-0.075	-0.128
<i>Excluding California</i>		0.122	0.141	0.118	-0.012	-0.037	-0.085	-0.084

SOURCES: MDRC calculations based on child support administrative data, PJAC management information system data, and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled “Excluding California” were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

“Reference Group” indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled and randomly assigned to the PJAC services group from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 606, California = 798, Franklin County = 558, Michigan = 529, Stark County = 499, Virginia = 484.

APPENDIX TABLE C.6 Research Question 1 Results: Coefficients on Covariates Representing Proportion Paid and Payment Frequency, Excluding California

Outcome, Excluding California	Covariates										
	Proportion of Obligation Paid in the Year Before Study Enrollment (Reference Group = 0%)							Proportion of Months with Any Payment in the Year Before Study Enrollment (Reference Group = 0%)			
	1% - 9%	10% - 19%	20% - 29%	30% - 39%	40% - 49%	50% - 99%	100%	1% - 25%	26% - 50%	51% - 75%	76% - 100%
<i>Case manager had a successful contact with the noncustodial parent</i>								0.021			0.032
<i>Number of successful contacts case manager had with the noncustodial parent</i>	0.193			0.234		0.045		0.016	0.431	0.503	
<i>Case conference with case manager and custodial parent occurred</i>	0.007	0.010	-0.000			0.025		0.036	0.022		
<i>Case action plan created with case manager</i>	0.003		0.069		0.079	0.023			0.022	0.029	0.032

SOURCES: MDRC calculations based on child support administrative data, PJAC management information system data, and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique model. Coefficients in this tables were calculated from models evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

“Reference Group” indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled and randomly assigned to the PJAC services group from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 606, Franklin County = 558, Michigan = 529, Stark County = 499, Virginia = 484.



APPENDIX D

Regression Results for the
Research Group-Interacted
Models Evaluated to Answer
Research Question 2

How to Read the Lasso Results Tables in Appendix D

The results tables in Appendix D use the format shown in the excerpts below (taken from Appendix Tables D.1a and D.1b). The excerpt from Appendix Table D.1a shows the lasso regression coefficients for the noninteracted female covariate, race and ethnicity covariates, and age covariates for the outcome “Proportion of child support obligation paid” across all sites (the nonitalicized row) and excluding parents from California (the italicized row). The excerpt from Appendix Table D.1b shows the lasso regression coefficients for the research group (RA)-interacted female covariate, race and ethnicity covariates, and age covariates for the same outcome “Proportion of child support obligation paid” across all sites (the nonitalicized row) and excluding parents from California (the italicized row).

APPENDIX TABLE D.1a Research Question 2 Results: Coefficients on Noninteracted Covariates Representing Parent Demographics (Excerpt)

Outcome	Noninteracted Covariates						
	Female	Race and Ethnicity (Reference Group = Black, non-Hispanic)			Age (Reference Group = 30 to 39)		
		White, non-Hispanic	Hispanic	Other	18-29	40-54	55 and older
Proportion of child support obligation paid				0.024		0.019	0.023
<i>Excluding California</i>	<i>-0.022</i>	<i>-0.006</i>	<i>0.015</i>	<i>0.080</i>	<i>-0.006</i>	<i>0.008</i>	<i>0.033</i>

APPENDIX TABLE D.1b Research Question 2 Results: Coefficients on Covariates Representing Parent Demographics Interacted with Research Group (Excerpt)

Outcome	Research Group-Interacted Covariates						
	Female	Race and Ethnicity (Reference Group = Black, non-Hispanic)			Age (Reference Group = 30 to 39)		
		White, non-Hispanic	Hispanic	Other	18-29	40-54	55 and older
Proportion of child support obligation paid	0.004	0.006	-0.000		-0.006	0.010	0.049
<i>Excluding California</i>	<i>0.040</i>	<i>0.012</i>	<i>-0.038</i>	<i>-0.036</i>	<i>-0.014</i>	<i>0.030</i>	<i>0.048</i>

Each row in an Appendix D table represents a unique, RA-interacted model, and the values within a row are the resulting regression coefficients for the given covariates (indicated by the column title) for that lasso model. The coefficients listed in an outcome's row across all Appendix D tables together constitute the results for that model (though Appendix Table D.6a and D.6b show results only from models that exclude California). For example, the results in the row "Proportion of child support obligation paid" in Appendix Tables D.1a through D.5a and D.1b through D.5b together make up the results of the all-site, RA-interacted model measuring the effects of parents' characteristics on the outcome "Proportion of child support obligation paid." The results in the next row with the label "Excluding California" in Appendix Tables D.1a through D.5a and D.1b through D.5b and the results in the italicized row labeled "Proportion of child support obligation paid" in Appendix Tables D.6a and D.6b make up the results of the RA-interacted model measuring the effects of parents' characteristics on the outcome "Proportion of child support obligation paid" across all sites *except* California.

All covariates analyzed in this report are binary variables, meaning a person either has or does not have the attribute described by the covariate. All parent characteristics are represented by at least two categories. For a given characteristic, the number of noninteracted covariates is equal to the number of RA-interacted covariates. The number of noninteracted and the number of RA-interacted covariates are each one less than the total number of categories the characteristic comprises, because one category must be used as the point of reference, or the reference group. A noninteracted covariate represents a single category of a parent characteristic, and its coefficient can be interpreted as the difference in the outcome for having the covariate attribute relative to the reference group. An RA-interacted covariate represents a single category of a parent characteristic interacted with research group assignment, and its coefficient can be interpreted as the difference in the outcome for having the covariate attribute *and* being in the PJAC services group, relative to the reference group. If no coefficient value is listed for a covariate, the lasso kicked out that covariate, indicating that the lasso determined that the covariate was not sufficiently related to the outcome. When a covariate is kicked out, the effect of that covariate on the outcome or impact is assumed to be no different from the effect of the reference group on that outcome or impact.

For example, the characteristic "female" comprises the categories "female" and "not female" (in this case, equivalent to "male"), and the characteristic is represented by a noninteracted covariate and an RA-interacted covariate "female." Per the excerpt from Appendix Table D.1a, across all sites, female parents are likely to pay the same proportion of their obligations as male parents, regardless of research group assignment. Looking at impacts, per the excerpt from Appendix Table D.1b, the difference in proportion paid between a parent in PJAC services group and a parent in the business-as-usual group is 0.4 percentage points greater for female parents than for male parents.

The characteristic "race and ethnicity," for example, includes the categories "Black, non-Hispanic," "White, non-Hispanic," "Hispanic," and "Other Race or Ethnicity." "Black, non-Hispanic" was selected as the reference group, and the latter three categories were included as noninteracted and RA-interacted covariates. Looking at the model that excludes California in the excerpt from Appendix D.1a, White parents are likely to pay 0.6 percentage points less of their obligations than Black par-

ents, and Hispanic parents and parents of other race and ethnicity are likely to pay 1.5 percentage points and 8 percentage points more, respectively, than Black parents. Turning to impacts, excluding California, the difference in proportion paid between a parent in PJAC services group and a parent in the business-as-usual group is 1.2 percentage points greater for White parents, 3.8 percentage points less for Hispanic parents, and 3.6 percentage points less for parents of other race and ethnicity, each relative to Black parents.



APPENDIX TABLE D.1a Research Question 2 Results: Coefficients on Noninteracted Covariates Representing Parent Demographics

Outcome	Noninteracted Covariates						
	Female	Race and Ethnicity (Reference Group = Black, non-Hispanic)			Age (Reference Group = 30 to 39)		
		White, non-Hispanic	Hispanic	Other	18-29	40-54	55 and older
<u>Service receipt and enforcement actions</u>							
Had a case closure							
<i>Excluding California</i>							
Received an order modification					-0.007		-0.011
<i>Excluding California</i>		-0.000	0.005		-0.014		-0.018
Civil contempt of court filed	-0.016	0.010	-0.004				
<i>Excluding California</i>							
Bench warrant issued							
<i>Excluding California</i>							
License suspended ^a			0.013		0.026	-0.008	
<i>Excluding California^a</i>							
<u>Child support payments and debt</u>							
Proportion of child support obligation paid				0.024		0.019	0.023
<i>Excluding California</i>	-0.022	-0.006	0.015	0.080	-0.006	0.008	0.033
Proportion of months with any payment	-0.016	-0.010	-0.018	0.020	0.008		
<i>Excluding California</i>	-0.004						
Total amount paid	-14.63	0.27		224.70		64.41	
<i>Excluding California</i>				144.70			
Total debt owed in the final month of the follow-up period	-397.21			108.77	-293.11		1,228.54
<i>Excluding California</i>					-54.05		

SOURCES: MDRC calculations based on child support administrative data and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique random-assignment-group-interacted model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled “Excluding California” were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

“Reference Group” indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, California = 1,231, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.

^aExcludes Arizona.

APPENDIX TABLE D.1b Research Question 2 Results: Coefficients on Covariates Representing Parent Demographics Interacted with Research Group

Outcome	Research Group-Interacted Covariates						
	Female	Race and Ethnicity (Reference Group = Black, non-Hispanic)			Age (Reference Group = 30 to 39)		
		White, non-Hispanic	Hispanic	Other	18-29	40-54	55 and older
<u>Service receipt and enforcement actions</u>							
Had a case closure							
<i>Excluding California</i>							
Received an order modification							-0.006
<i>Excluding California</i>							-0.006
Civil contempt of court filed						-0.010	-0.020
<i>Excluding California</i>							
Bench warrant issued							
<i>Excluding California</i>			-0.011				
License suspended ^a			-0.000			-0.024	-0.059
<i>Excluding California^a</i>							
<u>Child support payments and debt</u>							
Proportion of child support obligation paid	0.004	0.006	-0.000		-0.006	0.010	0.049
<i>Excluding California</i>	0.040	0.012	-0.038	-0.036	-0.014	0.030	0.048
Proportion of months with any payment						0.014	
<i>Excluding California</i>						0.002	
Total amount paid							
<i>Excluding California</i>							
Total debt owed in the final month of the follow-up period	-291.32		-313.97				2,728.49
<i>Excluding California</i>	-10.43						

SOURCES: MDRC calculations based on child support administrative data and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique random-assignment-group-interacted model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled “Excluding California” were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

“Reference Group” indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, California = 1,231, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.

^aExcludes Arizona.

APPENDIX TABLE D.2a Research Question 2 Results: Coefficients on Noninteracted Covariates Representing Parents' Formal Earnings

Outcome	Noninteracted Covariates				
	Total Formal Earnings in the Year Before Study Enrollment (Reference Group = \$0)				
	\$.01 - \$2,499	\$2,500 - \$9,999	\$10,000 - \$19,999	\$20,000 - \$29,999	\$30,000 or more
<u>Service receipt and enforcement actions</u>					
Had a case closure					
<i>Excluding California</i>					
Received an order modification					
<i>Excluding California</i>					
Civil contempt of court filed	0.004		-0.044	-0.009	-0.061
<i>Excluding California</i>			-0.002		
Bench warrant issued					
<i>Excluding California</i>					-0.019
License suspended ^a			0.022	0.032	
<i>Excluding California^a</i>			0.007		
<u>Child support payments and debt</u>					
Proportion of child support obligation paid	-0.008		0.052	0.131	0.191
<i>Excluding California</i>	-0.032	-0.026	0.021	0.110	0.193
Proportion of months with any payment	-0.009	0.012	0.045	0.099	0.231
<i>Excluding California</i>			0.027	0.065	0.189
Total amount paid	-33.21		176.55	498.22	1,867.45
<i>Excluding California</i>			132.13	451.51	1,550.39
Total debt owed in the final month of the follow-up period				-426.79	-1,245.65
<i>Excluding California</i>			0.64		

SOURCES: MDRC calculations based on child support administrative data and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique random-assignment-group-interacted model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled "Excluding California" were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

"Reference Group" indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, California = 1,231, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.

^aExcludes Arizona.

APPENDIX TABLE D.2b Research Question 2 Results: Coefficients on Covariates Representing Parents' Formal Earnings Interacted with Research Group

Outcome	Research Group-Interacted Covariates				
	Total Formal Earnings in the Year Before Study Enrollment (Reference Group = \$0)				
	\$0.01 - \$2,499	\$2,500 - \$9,999	\$10,000 - \$19,999	\$20,000 - \$29,999	\$30,000 or more
<u>Service receipt and enforcement actions</u>					
Had a case closure					
<i>Excluding California</i>					
Received an order modification					
<i>Excluding California</i>					0.026
Civil contempt of court filed					
<i>Excluding California</i>					
Bench warrant issued					
<i>Excluding California</i>			-0.004		
License suspended ^a					
<i>Excluding California^a</i>					
<u>Child support payments and debt</u>					
Proportion of child support obligation paid		0.012	0.027		0.079
<i>Excluding California</i>	0.040	0.033	0.057	0.015	0.061
Proportion of months with any payment			0.030	0.013	
<i>Excluding California</i>			0.014	0.016	
Total amount paid					
<i>Excluding California</i>					
Total debt owed in the final month of the follow-up period					-1,188.81
<i>Excluding California</i>					

SOURCES: MDRC calculations based on child support administrative data and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique random-assignment-group-interacted model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled "Excluding California" were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

"Reference Group" indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, California = 1,231, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.

^aExcludes Arizona.

APPENDIX TABLE D.3a Research Question 2 Results: Coefficients on Noninteracted Covariates Representing Study Enrollment Information

Outcome	Assigned to PJAC Services Group	Noninteracted Covariates								
		Quarter of Random Assignment (Reference Group = 2018 Q1) ^a					Site (Reference Group = Franklin County)			
		2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	Arizona	California	Michigan	Stark County
<u>Service receipt and enforcement actions</u>										
Had a case closure				0.000						
<i>Excluding California</i>						-0.003	NA			
Received an order modification								-0.027	0.038	0.123
<i>Excluding California</i>								NA	0.047	0.120
Civil contempt of court filed	-0.481					-0.019			0.021	-0.182
<i>Excluding California</i>	-0.515							NA		0.017
Bench warrant issued	-0.113								0.067	
<i>Excluding California</i>	-0.139					-0.022	NA	0.087	-0.035	
License suspended ^b		0.020	-0.002		0.008		NA	0.481		-0.062
<i>Excluding California^b</i>	-0.020				0.006		NA	NA		-0.049
<u>Child support payments and debt</u>										
Proportion of child support obligation paid	-0.032	0.010		-0.005	0.004		0.047	0.019	0.116	0.005
<i>Excluding California</i>	-0.023	0.024		0.001	0.022	-0.004	0.121	NA	0.156	0.070
Proportion of months with any payment		0.006		-0.002	-0.003			-0.038	0.004	0.039
<i>Excluding California</i>		0.013						NA		0.029
Total amount paid							441.02			71.52
<i>Excluding California</i>	-11.49						399.92	NA		12.63
Total debt owed in the final month of the follow-up period			-123.44			-208.97	1,690.09	4,424.51		-319.53
<i>Excluding California</i>						-92.65	3,111.56	NA		

(continued)

APPENDIX TABLE D.3a (Continued)

SOURCES: MDRC calculations based on child support administrative data and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique random-assignment-group-interacted model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled "Excluding California" were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

"Reference Group" indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

"NA" denotes that the covariate was not included in the model.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, California = 1,231, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.

^aVirginia began enrollment in June (quarter 2) 2018. 2018 quarter 1 only includes parents who enrolled in February and March 2018, and 2019 quarter 2 only includes parents who enrolled in April 2019.

^bExcludes Arizona.

APPENDIX TABLE D.3b Research Question 2 Results: Coefficients on Covariates Representing Study Enrollment Information Interacted with Research Group

Outcome	Research Group-Interacted Covariates									
	Quarter of Random Assignment (Reference Group = 2018 Q1) ^a					Site (Reference Group = Franklin County)				
	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	Arizona	California	Michigan	Stark County	Virginia
<u>Service receipt and enforcement actions</u>										
Had a case closure	-0.001								0.012	
<i>Excluding California</i>							NA		0.011	
Received an order modification										0.065
<i>Excluding California</i>					0.005		NA			0.070
Civil contempt of court filed		-0.055	-0.070	-0.072	-0.099	-0.094	-0.042			
<i>Excluding California</i>					-0.003	-0.105	NA			
Bench warrant issued										
<i>Excluding California</i>							NA	-0.005		
License suspended ^b						NA	0.031	-0.009		
<i>Excluding California^b</i>						NA	NA			
<u>Child support payments and debt</u>										
Proportion of child support obligation paid				-0.001	0.000	-0.000		-0.000	0.028	
<i>Excluding California</i>	-0.001	0.001	-0.003	-0.018	0.029	-0.065	NA	-0.071	-0.011	-0.054
Proportion of months with any payment	0.002		-0.014				-0.005	-0.046	0.006	-0.041
<i>Excluding California</i>			-0.011				NA	-0.028	0.003	-0.029
Total amount paid										-7.59
<i>Excluding California</i>							NA			
Total debt owed in the final month of the follow-up period								102.95		
<i>Excluding California</i>								NA		

(continued)

APPENDIX TABLE D.3b (Continued)

SOURCES: MDRC calculations based on child support administrative data and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique random-assignment-group-interacted model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled “Excluding California” were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

“Reference Group” indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

“NA” denotes that the covariate was not included in the model.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, California = 1,231, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.

^aVirginia began enrollment in June (quarter 2) 2018. 2018 quarter 1 only includes parents who enrolled in February and March 2018, and 2019 quarter 2 only includes parents who enrolled in April 2019.

^bExcludes Arizona.

APPENDIX TABLE D.4a Research Question 2 Results: Coefficients on Noninteracted Covariates Representing Case Characteristics

Outcome	Noninteracted Covariates						
	Oldest Case 5 Years Old or Less	Custodial Parent and Child(ren) Receiving TANF	Has a Debt-Only Case	More Than One Open Case	Monthly Amount Due (Reference Group = \$250 to \$499)		
					\$0 - \$249	\$500 - 749	\$750 or more
<u>Service receipt and enforcement actions</u>							
Had a case closure				0.076			
<i>Excluding California</i>				0.080	0.003		
Received an order modification			-0.004	0.017	-0.016	0.002	0.010
<i>Excluding California</i>		0.026		0.012	-0.020	0.006	0.022
Civil contempt of court filed				0.006	-0.010		0.009
<i>Excluding California</i>							
Bench warrant issued							
<i>Excluding California</i>							
License suspended ^a	0.042	0.025	-0.006	0.003	-0.031		
<i>Excluding California^a</i>			-0.009		-0.001		
<u>Child support payments and debt</u>							
Proportion of child support obligation paid	-0.014	-0.013	0.016	-0.040	0.062	-0.033	-0.038
<i>Excluding California</i>	-0.030	0.016	-0.002	-0.035	0.013	-0.051	-0.015
Proportion of months with any payment	-0.007	-0.020		-0.011	-0.011	-0.001	0.004
<i>Excluding California</i>			-0.001		-0.006		0.001
Total amount paid		-44.10	-10.09		-198.46	31.75	682.14
<i>Excluding California</i>					-180.92	30.04	753.79
Total debt owed in the final month of the follow-up period	-274.19				-1,725.65	1,140.42	5,966.22
<i>Excluding California</i>	-564.00			948.71	-1,519.24	842.79	3,426.77

(continued)

APPENDIX TABLE D.4a (Continued)

SOURCES: MDRC calculations based on child support administrative data and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique random-assignment-group-interacted model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled “Excluding California” were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

“Reference Group” indicates the category of each characteristic excluded from evaluation of the model.

TANF = Temporary Assistance for Needy Families.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, California = 1,231, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.

^aExcludes Arizona.

APPENDIX TABLE D.4b Research Question 2 Results: Coefficients on Covariates Representing Case Characteristics Interacted with Research Group

Outcome	Research Group-Interacted Covariates						
	Oldest Case 5 Years Old or Less	Custodial Parent and Child(ren) Receiving TANF	Has a Debt-Only Case	More Than One Open Case	Monthly Amount Due (Reference Group = \$250 to \$499)		
					\$0 - \$249	\$500 - \$749	\$750 or more
<u>Service receipt and enforcement actions</u>							
Had a case closure							
<i>Excluding California</i>							
Received an order modification		0.002	-0.025				0.048
<i>Excluding California</i>		0.002	-0.035		-0.002		0.052
Civil contempt of court filed		-0.010	-0.003		-0.030		
<i>Excluding California</i>					-0.035		
Bench warrant issued							
<i>Excluding California</i>					-0.011		
License suspended ^a			-0.003				
<i>Excluding California^a</i>							
<u>Child support payments and debt</u>							
Proportion of child support obligation paid			0.004				
<i>Excluding California</i>	0.019	-0.056	-0.001	0.000	0.019	0.063	0.045
Proportion of months with any payment		-0.009				0.002	
<i>Excluding California</i>		-0.025		-0.000			
Total amount paid			-45.54			11.83	
<i>Excluding California</i>		-4.04	-76.25				
Total debt owed in the final month of the follow-up period	-673.91				-275.17	2,000.57	
<i>Excluding California</i>							

(continued)

APPENDIX TABLE D.4b (Continued)

SOURCES: MDRC calculations based on child support administrative data and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique random-assignment-group-interacted model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled “Excluding California” were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

“Reference Group” indicates the category of each characteristic excluded from evaluation of the model.

TANF = Temporary Assistance for Needy Families.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, California = 1,231, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.

^aExcludes Arizona.

APPENDIX TABLE D.5a Research Question 2 Results: Coefficients on Noninteracted Covariates Representing Contempt, Amount Paid, and Debt

Outcome	Noninteracted Covariates							
	Ever Referred to Contempt	Total Amount Paid in the Year Before Study Enrollment (Reference Group = \$0)			Total Child Support Debt Owed (Reference Group = \$0 to \$9,999)			
		\$0.01 - \$999	\$1,000 - 2,999	\$3,000 or more	\$10,000 - \$29,000	\$30,000 - \$59,999	\$60,000 - \$89,999	\$90,000 or more
<u>Service receipt and enforcement actions</u>								
Had a case closure								
<i>Excluding California</i>								
Received an order modification				0.004				-0.006
<i>Excluding California</i>		-0.001		0.013				-0.014
Civil contempt of court filed	0.024							
<i>Excluding California</i>	0.015							
Bench warrant issued								
<i>Excluding California</i>	0.006				0.003			
License suspended ^a	0.002	-0.023	-0.005			-0.037	-0.065	-0.120
<i>Excluding California^a</i>				0.014		-0.002		
<u>Child support payments and debt</u>								
Proportion of child support obligation paid	0.014	0.093	0.169	0.238	-0.047	-0.067	-0.074	-0.067
<i>Excluding California</i>	0.023	-0.040	-0.045	-0.024	-0.046	-0.060	-0.128	-0.116
Proportion of months with any payment	0.004	0.108	0.172	0.199	-0.003	-0.013	-0.022	
<i>Excluding California</i>		0.088	0.107	0.104			-0.016	
Total amount paid		342.69	847.61	2,283.74	-13.28			
<i>Excluding California</i>		113.06	603.21	2,005.01			-14.67	
Total debt owed in the final month of the follow-up period		-319.56		87.59	11,638.17	33,635.90	62,214.45	120,724.64
<i>Excluding California</i>				22.00	11,159.84	32,501.46	60,713.64	115,039.19

(continued)

APPENDIX TABLE D.5a (Continued)

SOURCES: MDRC calculations based on child support administrative data and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique random-assignment-group-interacted model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled “Excluding California” were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

“Reference Group” indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, California = 1,231, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.

^aExcludes Arizona.

APPENDIX TABLE D.5b Research Question 2 Results: Coefficients on Covariates Representing Contempt, Amount Paid, and Debt Interacted with Research Group

Outcome	Ever Referred to Contempt	Research Group-Interacted Covariates						
		Total Amount Paid in the Year Before Study Enrollment (Reference Group = \$0)			Total Child Support Debt Owed (Reference Group = \$0 to \$9,999)			
		\$0.01 - \$999	\$1,000 - \$2,999	\$3,000 or more	\$10,000 - \$29,000	\$30,000 - \$59,999	\$60,000 - \$89,999	\$90,000 or more
<u>Service receipt and enforcement actions</u>								
Had a case closure								
<i>Excluding California</i>								
Received an order modification								
<i>Excluding California</i>								-0.002
Civil contempt of court filed		-0.020	-0.008					
<i>Excluding California</i>								
Bench warrant issued								
<i>Excluding California</i>								
License suspended ^a			-0.013		-0.020	-0.027		
<i>Excluding California^a</i>								
<u>Child support payments and debt</u>								
Proportion of child support obligation paid	-0.025	0.004	0.007	-0.013		-0.017		-0.041
<i>Excluding California</i>	-0.038	0.000	-0.041	-0.136	0.004	-0.028	0.032	0.020
Proportion of months with any payment	-0.010	0.015			-0.004	-0.011		-0.034
<i>Excluding California</i>	-0.009	0.001				-0.008		
Total amount paid	-83.39				-2.05	-151.01		-74.09
<i>Excluding California</i>	-52.04					-63.15		
Total debt owed in the final month of the follow-up period				1,456.48				7,535.02
<i>Excluding California</i>				1,074.17			364.72	658.24

(continued)

APPENDIX TABLE D.5b (Continued)

SOURCES: MDRC calculations based on child support administrative data and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique random-assignment-group-interacted model. Coefficients in the row of the outcome description were calculated from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The coefficients in the subsequent row labeled “Excluding California” were calculated from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

“Reference Group” indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, California = 1,231, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.

^aExcludes Arizona.

APPENDIX TABLE D.6a Research Question 2 Results: Coefficients on Noninteracted Covariates Representing Proportion Paid and Payment Frequency, Excluding California

Outcome, Excluding California	Noninteracted Covariates										
	Proportion of Obligation Paid in the Year Before Study Enrollment (Reference Group = 0%)							Proportion of Months with Any Payment in the Year Before Study Enrollment (Reference Group = 0%)			
	1% - 9%	10% - 19%	20% - 29%	30% - 39%	40% - 49%	50% - 99%	100%	1% - 25%	26% - 50%	51% - 75%	76% - 100%
<u>Service receipt and enforcement actions</u>											
<i>Had a case closure</i>											
<i>Received an order modification</i>								-0.036			
<i>Civil contempt of court filed</i>											
<i>Bench warrant issued</i>											
<i>License suspended^a</i>			0.003			0.037				0.008	
<u>Child support payments and debt</u>											
<i>Proportion of child support obligation paid</i>	0.237	0.270	0.270	0.323	0.339	0.415	0.571	-0.117	-0.055	-0.139	-0.168
<i>Proportion of months with any payment</i>		0.012		0.007			-0.004		0.091	0.138	0.083
<i>Total amount paid</i>		77.51	133.11					27.56	372.73		
<i>Total debt owed in the final month of the follow-up period</i>											-18.17

SOURCES: MDRC calculations based on child support administrative data and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique random-assignment-group-interacted model. Coefficients in this tables were calculated from models evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

"Reference Group" indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.

^aExcludes Arizona.

APPENDIX TABLE D.6b Research Question 2 Results: Coefficients on Covariates Representing Proportion Paid and Payment Frequency Interacted with Research Group, Excluding California

Outcome, Excluding California	Research Group-Interacted Covariates										
	Proportion of Obligation Paid in the Year Before Study Enrollment (Reference Group = 0%)							Proportion of Months with Any Payment in the Year Before Study Enrollment (Reference Group = 0%)			
	1% - 9%	10% - 19%	20% - 29%	30% - 39%	40% - 49%	50% - 99%	100%	1% - 25%	26% - 50%	51% - 75%	76% - 100%
<u>Service receipt and enforcement actions</u>											
<i>Had a case closure</i>											
<i>Received an order modification</i>				0.008							
<i>Civil contempt of court filed</i>											
<i>Bench warrant issued</i>								-0.002			
<i>License suspended^a</i>											
<u>Child support payments and debt</u>											
<i>Proportion of child support obligation paid</i>	-0.018	0.023	0.078	0.060	0.085	0.071	0.063	0.001	-0.044	-0.006	0.168
<i>Proportion of months with any payment</i>		0.015	0.033			0.001					0.158
<i>Total amount paid</i>											1,809.04
<i>Total debt owed in the final month of the follow-up period</i>											

SOURCES: MDRC calculations based on child support administrative data and quarterly earnings data from the National Directory of New Hires.

NOTES: Results in this table are regression coefficients calculated using least absolute shrinkage and selection operator (lasso). For additional information on the lasso and modeling specifications, see Appendix B.

Each row in this table lists results from a unique random-assignment-group-interacted model. Coefficients in this tables were calculated from models evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

“Reference Group” indicates the category of each characteristic excluded from evaluation of the model.

A missing coefficient indicates the covariate was kicked out by the lasso because it was not sufficiently related to the outcome.

For additional information on covariates and outcomes, see Appendix B, Sections II and III.

The sample includes noncustodial parents enrolled from February 1, 2018, through April 30, 2019, for whom race/ethnicity information was available. Sample sizes by site are as follows: Arizona = 935, Franklin County = 859, Michigan = 817, Stark County = 770, Virginia = 741.

^aExcludes Arizona.



APPENDIX E

Predicted Values for Three
Parent Profiles for the Outcomes
Analyzed for
Research Questions 1 and 2

APPENDIX TABLE E.1 Predicted Research Question 1 Outcomes for Three Parent Profiles

Outcome	Parent Profile		
	High Association	Medium Association	Low Association
Case manager had a successful contact with the noncustodial parent (%)	91.4	79.9	62.4
<i>Excluding California</i>	84.4	78.5	61.5
Number of successful contacts case manager had with the noncustodial parent	6.0	4.5	3.4
<i>Excluding California</i>	5.9	5.1	3.7
Case conference with case manager and custodial parent occurred (%)	31.0	19.1	14.2
<i>Excluding California</i>	24.4	20.3	14.1
Case action plan created with case manager (%)	86.3	72.0	54.5
<i>Excluding California</i>	86.6	74.0	54.2

SOURCES: MDRC calculations based on child support administrative data, PJAC management information system data, and quarterly earnings data from the National Directory of New Hires.

NOTES: These results in this table are the predicted outcome values for a profile. The predicted outcomes values were calculated using the regression coefficients from a given outcome's noninteracted lasso model. For additional information on how the predicted values were calculated, see Appendix B.

Predicted values in the row of the outcome description were calculated using regression coefficients from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The predicted values in the subsequent row labeled "Excluding California" were calculated using regression coefficients from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

The three profiles represent three sets of covariate values for selected characteristics. For more information on the characteristics that make up each profile, see Appendix B. A profile has the same covariate values for each outcome, except where the site configuration requires the exclusion of covariates, as outlined in the previous note.

APPENDIX TABLE E.2 Predicted Impacts for Research Question 2 Outcomes for Three Parent Profiles

Outcome	Parent Profile								
	High Association			Medium Association			Low Association		
	PJAC Services Group	Business-as-Usual Group	Difference	PJAC Services Group	Business-as-Usual Group	Difference	PJAC Services Group	Business-as-Usual Group	Difference
Had a case closure (%)	2.9	2.9	0.0	2.9	2.9	0.0	2.9	2.9	0.0
<i>Excluding California</i>	2.9	2.9	0.0	2.9	2.9	0.0	2.9	2.9	0.0
Received an order modification (%)	7.1	7.1	0.0	6.7	6.7	0.0	3.8	6.3	-2.5
<i>Excluding California</i>	11.1	8.5	2.6	7.1	7.1	0.0	3.7	7.2	-3.5
Civil contempt of court filed (%)	27.0	75.0	-48.1	31.0	81.1	-50.0	35.1	83.5	-48.4
<i>Excluding California</i>	28.1	79.6	-51.5	28.1	79.6	-51.5	29.6	81.1	-51.5
Bench warrant issued (%)	5.7	17.0	-11.3	5.7	17.0	-11.3	5.7	17.0	-11.3
<i>Excluding California</i>	4.8	18.7	-13.9	6.8	20.6	-13.9	7.3	21.2	-13.9
License suspended (%)	15.4	15.4	0.0	2.5	5.2	-2.7	-1.5	-1.3	-0.3
<i>Excluding California</i>	8.3	10.3	-2.0	6.7	8.7	-2.0	6.0	8.1	-2.0
Proportion of monthly child support obligation paid (%)	62.4	59.1	3.3	17.0	20.2	-3.2	4.5	13.9	-9.5
<i>Excluding California</i>	62.5	45.1	17.4	19.0	22.8	-3.9	0.3	4.4	-4.1
Proportion of months with any payment (%)	61.5	61.5	0.0	30.4	29.9	0.5	15.2	19.6	-4.4
<i>Excluding California</i>	71.0	55.1	15.8	37.4	36.6	0.8	16.5	17.4	-0.9
Total amount paid (\$)	4,773	4,773	0	814	965	-151	409	612	-203
<i>Excluding California</i>	6,037	4,240	1,798	1,173	1,248	-75	544	684	-140
Total debt owed in the final month of the follow-up period (\$)	5,150	5,556	-406	40,305	40,305	0	135,248	127,713	7,535
<i>Excluding California</i>	7,600	6,526	1,074	39,569	39,569	0	122,765	122,107	658

(continued)

APPENDIX TABLE E.2 (Continued)

SOURCES: MDRC calculations based on child support administrative data and quarterly earnings data from the National Directory of New Hires.

NOTES: These results in this table are the predicted outcome values for a profile. The predicted outcomes values were calculated using the regression coefficients from a given outcome's random-assignment-group-interacted lasso model. For additional information on how the predicted values were calculated, see Appendix B.

Predicted values in the row of the outcome description were calculated using regression coefficients from a model evaluated across all six study sites but excluding covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment. The predicted values in the subsequent row labeled "Excluding California" were calculated using regression coefficients from a model evaluated across Arizona, Michigan, Franklin County, Stark County, and Virginia and including the covariates for the proportion of child support obligation paid in the year before study enrollment and the proportion of months with any payment in the year before study enrollment.

The three profiles represent three sets of covariate values for selected characteristics. For more information on the characteristics that make up each profile, see Appendix B. A profile has the same covariate values for each outcome, except where the site configuration requires the exclusion of covariates, as outlined in the previous note.

APPENDIX REFERENCES

- Buitrago, Katherine, Jamela Clark, Emily Dobson, Kimberly Drew, Suniya Farooqui, Rita Jefferson, Kathryn Kaplan, Niya Kelly, Yoojin Kim, Aces Lira, Taishi Neuman, and Maxica Williams. 2022. "Temporary Assistance for Needy Families: Sanctioning and Child Support Compliance Among Black Families in Illinois." *Health Affairs* 41, 12: 1,735-1,743.
- California Code, Unemployment Insurance Code § 1088.8 (2001).
- Center on Budget and Policy Priorities. 2022. "Policy Basics: Temporary Assistance for Needy Families." Website: <https://www.cbpp.org/research/family-income-support/policy-basics-an-introduction-to-tanf>.
- Columbia University Mailman School of Public Health. n.d. "Least Absolute Shrinkage and Selection Operator (LASSO)." Website: <https://www.publichealth.columbia.edu/research/population-health-methods/least-absolute-shrinkage-and-selection-operator-lasso>. Accessed on August 22, 2023.
- Cummings, Danielle. 2020. "Who Is at Risk of Contempt of Court for Child Support Noncompliance?" New York: MDRC.
- Falk, Gene. 2023. *The Temporary Assistance for Needy Families (TANF) Block Grant: A Primer on TANF Financing and Federal Requirements*. Washington, DC: Congressional Research Service.
- Friedman, Jerome, Trevor Hastie, Noah Simon, Robert Tibshirani, Balasubramanian Narasimhan, and Jeffrey Wong. 2023. "Cross-Validation for Glmnet." Website: <https://glmnet.stanford.edu/reference/cv.glmnet.html>.
- Hastie, Trevor, Junyang Qian, and Kenneth Tay. 2023. "An Introduction to Glmnet." Website: <https://glmnet.stanford.edu/articles/glmnet.html>.
- Lee, Ji Hyung, Zhentao Shi, and Zhan Gao. 2022. "On LASSO for Predictive Regression." *Journal of Econometrics* 229, 2: 322-349.
- Office of Child Support Enforcement. 1999. "Policy Questions and Responses Regarding NDNH and SDNH." Website: <https://www.acf.hhs.gov/css/policy-guidance/policy-questions-and-responses-regarding-ndnh-and-sdnh>.
- Office of Child Support Enforcement. 2017. "Final Rule Summary." Website: https://www.acf.hhs.gov/sites/default/files/documents/ocse/fem_final_rule_summary.pdf.
- Office of Child Support Services. 2024. "State Contact and Program Information: New Hire Reporting." Website: <https://ocsp.acf.hhs.gov/irg/irgpdf.pdf?geoType=OGP&groupCode=EMP&addrType=NHR&addrClassType=EMP>.
- Ohio Revised Code § 3121.891. 2013.
- Schneider, Jeff. 1997. "Cross Validation." Carnegie Mellon University School of Computer Science. Website: <https://www.cs.cmu.edu/~schneide/tut5/node42.html>.
- Skemer, Melanie. 2023. *Testing a New Approach to Addressing Nonpayment of Child Support: Effects of the Procedural Justice-Informed Alternatives to Contempt Demonstration*. New York: MDRC.
- Tibshirani, Robert. 1996. "Regression Shrinkage and Selection via the Lasso." *Journal of the Royal Statistical Society, Series B (Methodological)* 58, 1: 267-288.
- Virginia New Hire Reporting Center. n.d. "Frequently Asked Questions." Website: <https://va-newhire.com/faqs#faq:26>. Accessed on December 15, 2023.

