

# Comparative Strengths and Weaknesses

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# Snow on Cholera

# Three Families of Research

- 1 Qualitative
- 2 Quantitative
- 3 Experimental

# Qual/Quant: RSI

- 1 Level of Measurement
- 2 Size of the  $N$
- 3 Statistical Tests
- 4 Thick vs. Thin Analysis

# Qual/Quant: RSI

DSOs vs. CPOs

# Qual/Quant: Two Cultures

## ① Approaches to explanation

# Qual/Quant: Two Cultures

- 1 Approaches to explanation
- 2 Concepts of causation

# Qual/Quant: Two Cultures

- 1 Approaches to explanation
- 2 Concepts of causation
- 3 Multivariate explanations



# Qual/Quant: Two Cultures

- 1 Approaches to explanation
- 2 Concepts of causation
- 3 Multivariate explanations
- 4 Equifinality

# Qual/Quant: Two Cultures

- 1 Approaches to explanation
- 2 Concepts of causation
- 3 Multivariate explanations
- 4 Equifinality
- 5 Scope and generalization

# Qual/Quant: Two Cultures

## 6 Case selection practices

# Qual/Quant: Two Cultures

- 6 Case selection practices
- 7 Weighting observations

# Qual/Quant: Two Cultures

- 6 Case selection practices
- 7 Weighting observations
- 8 Substantively important cases

# Qual/Quant: Two Cultures

- 6 Case selection practices
- 7 Weighting observations
- 8 Substantively important cases
- 9 Lack of fit

# Qual/Quant: Two Cultures

- 6 Case selection practices
- 7 Weighting observations
- 8 Substantively important cases
- 9 Lack of fit
- 10 Concepts and measurement

# Qualitative Research

- Archival Work



# Qualitative Research

- Archival Work
- In-depth Interviews

# Qualitative Research

- Archival Work
- In-depth Interviews
- Expert Interviews

# Qualitative Research

- Archival Work
- In-depth Interviews
- Expert Interviews
- Content Analysis

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- In-depth Interviews
- Expert Interviews
- Content Analysis
- Focus Groups

# Qualitative Research

- Archival Work
- In-depth Interviews
- Expert Interviews
- Content Analysis
- Focus Groups
- Participant Observation

# Strengths

- Archival Work

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# Weaknesses

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# Weaknesses

- Archival Work
- In-depth Interviews
- Expert Interviews
- Content Analysis
- Focus Groups
- Participant Observation

# Shared Weaknesses

# Quantitative Research

- Surveys

# Quantitative Research

- Surveys
- Cross-National Regression

# Quantitative Research

- Surveys
- Cross-National Regression
- Ecological Analysis

# Quantitative Research

- Surveys
- Cross-National Regression
- Ecological Analysis
- Individual-Level Analysis of Records

# Quantitative Research

- Surveys
- Cross-National Regression
- Ecological Analysis
- Individual-Level Analysis of Records
- Event-History Analysis

# Quantitative Research

- Surveys
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- Event-History Analysis
- Time-Series Analysis



# Quantitative Research

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- Cross-National Regression
- Ecological Analysis
- Individual-Level Analysis of Records
- Event-History Analysis
- Time-Series Analysis
- TSCS Analysis

# Shared Weaknesses

# Experiments

- Randomization

# Experiments

- Randomization
- Manipulation

# Bolstering Methods

# Bolstering Methods

TABLE 1—THE SAMPLE MEANS AND STANDARD DEVIATIONS OF PRE-TRAINING EARNINGS AND OTHER CHARACTERISTICS FOR THE NSW AFDC AND MALE PARTICIPANTS

Variable	Full National Supported Work Sample			
	AFDC Participants		Male Participants	
	Treatments	Controls	Treatments	Controls
Age	33.37 (7.43)	33.63 (7.18)	24.49 (6.58)	23.99 (6.54)
Years of School	10.30 (1.92)	10.27 (2.00)	10.17 (1.75)	10.17 (1.76)
Proportion High School Dropouts	.70 (.46)	.69 (.46)	.79 (.41)	.80 (.40)
Proportion Married	.02 (.15)	.04 (.20)	.14 (.35)	.13 (.35)
Proportion Black	.84 (.37)	.82 (.39)	.76 (.43)	.75 (.43)
Proportion Hispanic	.12 (.32)	.13 (.33)	.12 (.33)	.14 (.35)
Real Earnings	\$393	\$395	1472	1558
1 year Before	(1,203)	(1,149)	(2656)	(2961)
Training	[43]	[41]	[58]	[63]
Real Earnings	\$854	\$894	2860	3030
2 years Before	(2,087)	(2,240)	(4729)	(5293)
Training	[74]	[79]	[104]	[113]
Hours Worked	90	92	278	274
1 year Before	(251)	(253)	(466)	(458)
Training	[9]	[9]	[10]	[10]
Hours Worked	186	188	458	469
2 years Before	(434)	(450)	(654)	(689)
Training	[15]	[16]	[14]	[15]
Month of Assignment (Jan. 78 = 0)	-12.26 (4.30)	-12.30 (4.23)	-16.08 (5.97)	-15.91 (5.89)
Number of Observations	800	802	2083	2193

Note: The numbers shown in parentheses are the standard deviations and those in the



# Bolstering Methods

TABLE 2—ANNUAL EARNINGS OF NSW TREATMENTS, CONTROLS, AND EIGHT CANDIDATE COMPARISON GROUPS FROM THE *PSID* AND THE *CPS-SSA*

Year	Treatments	Controls	Comparison Group <sup>a,b</sup>							
			<i>PSID</i> -1	<i>PSID</i> -2	<i>PSID</i> -3	<i>PSID</i> -4	<i>CPS-SSA</i> -1	<i>CPS-SSA</i> -2	<i>CPS-SSA</i> -3	<i>CPS-SSA</i> -4
1975	\$895 (81)	\$877 (90)	7,303 (317)	2,327 (286)	937 (189)	6,654 (428)	7,788 (63)	3,748 (250)	4,575 (135)	2,049 (333)
1976	\$1,794 (99)	\$646 (63)	7,442 (327)	2,697 (317)	665 (157)	6,770 (463)	8,547 (65)	4,774 (302)	3,800 (128)	2,036 (337)
1977	\$6,143 (140)	\$1,518 (112)	7,983 (335)	3,219 (376)	891 (229)	7,213 (484)	8,562 (68)	4,851 (317)	5,277 (153)	2,844 (450)
1978	\$4,526 (270)	\$2,885 (244)	8,146 (339)	3,636 (421)	1,631 (381)	7,564 (480)	8,518 (72)	5,343 (365)	5,665 (166)	3,700 (593)
1979	\$4,670 (226)	\$3,819 (208)	8,016 (334)	3,569 (381)	1,602 (334)	7,482 (462)	8,023 (73)	5,343 (371)	5,782 (170)	3,733 (543)
Number of Observations	600	585	595	173	118	255	11,132	241	1,594	87

# Bolstering Methods

TABLE 3—ANNUAL EARNINGS OF NSW MALE TREATMENTS, CONTROLS, AND SIX CANDIDATE COMPARISON GROUPS FROM THE *PSID* AND *CPS-SSA*

Year	Treatments	Controls	Comparison Group <sup>a,b</sup>					
			<i>PSID</i> -1	<i>PSID</i> -2	<i>PSID</i> -3	<i>CPS-SSA</i> -1	<i>CPS-SSA</i> -2	<i>CPS-SSA</i> -3
1975	\$3,066 (283)	\$3,027 (252)	19,056 <sup>a</sup> (272)	7,569 (568)	2,611 (492)	13,650 (73)	7,387 (206)	2,729 (197)
1976	\$4,035 (215)	\$2,121 (163)	20,267 (296)	6,152 (601)	3,191 (609)	14,579 (75)	6,390 (187)	3,863 (267)
1977	\$6,335 (376)	\$3,403 (228)	20,898 (296)	7,985 (621)	3,981 (594)	15,046 (76)	9,305 (225)	6,399 (398)
1978	\$5,976 (402)	\$5,090 (227)	21,542 (311)	9,996 (703)	5,279 (686)	14,846 (76)	10,071 (241)	7,277 (431)
Number of Observations	297	425	2,493	253	128	15,992	1,283	305



# Bolstering Methods

TABLE 4—EARNINGS COMPARISONS AND ESTIMATED TRAINING EFFECTS FOR THE NSW AFDC PARTICIPANTS USING COMPARISON GROUPS FROM THE *PSID* AND THE *CPS-SSA*<sup>a,b</sup>

Name of Comparison Group <sup>d</sup>	Comparison Group Earnings Growth 1975–79 (1)	NSW Treatment Earnings Less Comparison Group Earnings				Difference in Differences: Difference in Earnings Growth 1975–79 Treatments Less Comparisons		Unrestricted Difference in Differences: Quasi Difference in Earnings Growth 1975–79		Controlling for All Observed Variables and Pre-Training Earnings	
		Pre-Training Year, 1975		Post-Training Year, 1979		Without Age	With Age	Unad-justed	Ad-justed <sup>c</sup>	Without AFDC	With AFDC
		Unad-justed (2)	Ad-justed <sup>c</sup> (3)	Unad-justed (4)	Ad-justed <sup>c</sup> (5)	(6)	(7)	(8)	(9)	(10)	(11)
Controls	2,942 (220)	-17 (122)	-22 (122)	851 (307)	861 (306)	833 (323)	883 (323)	843 (308)	864 (306)	854 (312)	-
<i>PSID</i> -1	713 (210)	-6,443 (326)	-4,882 (336)	-3,357 (403)	-2,143 (425)	3,097 (317)	2,657 (333)	1,746 (357)	1,354 (380)	1,664 (409)	2,097 (491)
<i>PSID</i> -2	1,242 (314)	-1,467 (216)	-1,515 (224)	1,090 (468)	870 (484)	2,568 (473)	2,392 (481)	1,764 (472)	1,535 (487)	1,826 (537)	-
<i>PSID</i> -3	665 (351)	-77 (202)	-100 (208)	3,057 (532)	2,915 (543)	3,145 (557)	3,020 (563)	3,070 (531)	2,930 (543)	2,919 (592)	-
<i>PSID</i> -4	928 (311)	-5,694 (306)	-4,976 (323)	-2,822 (460)	-2,268 (491)	2,883 (417)	2,655 (434)	1,184 (483)	950 (503)	1,406 (542)	2,146 (652)
<i>CPS-SSA</i> -1	233 (64)	-6,928 (272)	-5,813 (309)	-3,363 (320)	-2,650 (365)	3,578 (280)	3,501 (282)	1,214 (272)	1,127 (309)	536 (349)	1,041 (503)
<i>CPS-SSA</i> -2	1,595 (360)	-2,888 (204)	-2,332 (256)	-683 (428)	-240 (536)	2,215 (438)	2,068 (446)	447 (468)	620 (554)	665 (651)	-
<i>CPS-SSA</i> -3	1,207 (166)	-3,715 (226)	-3,150 (325)	-1,122 (311)	-812 (452)	2,603 (307)	2,615 (328)	814 (305)	784 (429)	-99 (481)	1,246 (720)
<i>CPS-SSA</i> -4	1,684 (524)	-1,189 (249)	-780 (283)	926 (630)	756 (716)	2,126 (654)	1,833 (663)	1,222 (637)	952 (717)	827 (814)	-

# Bolstering Methods

TABLE 5—EARNINGS COMPARISONS AND ESTIMATED TRAINING EFFECTS FOR THE NSW MALE PARTICIPANTS USING COMPARISON GROUPS FROM THE *PSID* AND THE *CPS-SSA*<sup>a,b</sup>

Name of Comparison Group <sup>d</sup>	Comparison Group Earnings Growth 1975–78 (1)	NSW Treatment Earnings Less Comparison Group Earnings				Difference in Differences: Difference in Earnings Growth 1975–78 Treatments Less Comparisons		Unrestricted Difference in Differences: Quasi Difference in Earnings Growth 1975–78		Controlling for All Observed Variables and Pre-Training Earnings (10)
		Pre-Training Year, 1975		Post-Training Year, 1978		Without Age (6)	With Age (7)	Unad-justed (8)	Ad-justed <sup>c</sup> (9)	
		Unad-justed (2)	Ad-justed <sup>c</sup> (3)	Unad-justed (4)	Ad-justed <sup>c</sup> (5)					
Controls	\$2,063 (325)	\$39 (383)	\$ - 21 (378)	\$886 (476)	\$798 (472)	\$847 (560)	\$856 (558)	\$897 (467)	\$802 (467)	\$662 (506)
<i>PSID</i> -1	\$2,043 (237)	-\$15,997 (795)	-\$7,624 (851)	-\$15,578 (913)	-\$8,067 (990)	\$425 (650)	-\$749 (692)	-\$2,380 (680)	-\$2,119 (746)	-\$1,228 (896)
<i>PSID</i> -2	\$6,071 (637)	-\$4,503 (608)	-\$3,669 (757)	-\$4,020 (781)	-\$3,482 (935)	\$484 (738)	-\$650 (850)	-\$1,364 (729)	-\$1,694 (878)	-\$792 (1024)
<i>PSID</i> -3	(\$3,322) (780)	(\$455) (539)	\$455 (704)	\$697 (760)	-\$509 (967)	\$242 (884)	-\$1,325 (1078)	\$629 (757)	-\$552 (967)	\$397 (1103)
<i>CPS-SSA</i> -1	\$1,196 (61)	-\$10,585 (539)	-\$4,654 (509)	-\$8,870 (562)	-\$4,416 (557)	\$1,714 (452)	\$195 (441)	-\$1,543 (426)	-\$1,102 (450)	-\$805 (484)
<i>CPS-SSA</i> -2	\$2,684 (229)	-\$4,321 (450)	-\$1,824 (535)	-\$4,095 (537)	-\$1,675 (672)	\$226 (539)	-\$488 (530)	-\$1,850 (497)	-\$782 (621)	-\$319 (761)
<i>CPS-SSA</i> -3	\$4,548 (409)	\$337 (343)	\$878 (447)	-\$1,300 (590)	\$224 (766)	-\$1,637 (631)	-\$1,388 (655)	-\$1,396 (582)	\$17 (761)	\$1,466 (984)

# Bolstering Methods

TABLE 6—ESTIMATED TRAINING EFFECTS USING TWO-STAGE ESTIMATOR

Variables Excluded from the Earnings Equation, but Included in the Participation Equation	Comparison Group	NSW AFDC Females		NSW Males	
		Heckman Correction for Program Participation Bias, Using Estimate of Conditional Expectation of Earnings Error as Regressor in Earnings Equation			
		Estimate of Coefficient for			
		Training Dummy	Estimate of Expectation	Training Dummy	Estimate of Expectation
Marital Status, Residency in an SMSA, Employment Status in 1976, AFDC Status in 1975, Number of Children	<i>PSID-1</i>	1,129 (385)	- 894 (396)	- 1,333 (820)	- 2,357 (781)
	<i>CPS-SSA-1</i>	1,102 (323)	- 606 (480)	- 22 (584)	- 1,437 (449)
	NSW Controls	837 (317)	- 18 (2376)	899 (840)	- 835 (2601)
Employment Status in 1976, AFDC Status in 1975, Number of Children	<i>PSID-1</i>	1,256 (405)	- 823 (410)	-	-
	<i>CPS-SSA-1</i>	439 (333)	- 979 (481)	-	-
	NSW Controls	-	-	-	-
Employment Status in 1976, Number of Children	<i>PSID-1</i>	1,564 (604)	- 552 (569)	- 1,161 (864)	- 2,655 (799)
	<i>CPS-SSA-1</i>	552 (514)	- 902 (551)	13 (584)	- 1,484 (450)
	NSW Controls	851 (318)	147 (2385)	889 (841)	- 808 (2603)
No Exclusion Restrictions	<i>PSID-1</i>	1,747 (620)	- 526 (568)	- 667 (905)	- 2,446 (806)
	<i>CPS-SSA-1</i>	805 (523)	- 908 (548)	213 (588)	- 1,364 (452)
	NSW Controls	861 (318)	284 (2385)	889 (840)	- 876 (2601)

# Bolstering Methods

Table 3. Estimated Training Effects for the NSW Male Participants Using Comparison Groups From PSID and CPS

	NSW earnings less comparison group earnings		NSW treatment earnings less comparison group earnings, conditional on the estimated propensity score					
	(1) Unadjusted	(2) Adjusted <sup>a</sup>	Quadratic in score <sup>b</sup> (3)	Stratifying on the score			Matching on the score	
				(4) Unadjusted	(5) Adjusted	(6) Observations <sup>c</sup>	(7) Unadjusted	(8) Adjusted <sup>d</sup>
NSW	1,794 (633)	1,672 (638)						
PSID-1 <sup>e</sup>	-15,205 (1,154)	731 (886)	294 (1,389)	1,608 (1,571)	1,494 (1,581)	1,255	1,691 (2,209)	1,473 (809)
PSID-2 <sup>f</sup>	-3,647 (959)	683 (1,028)	496 (1,193)	2,220 (1,768)	2,235 (1,793)	389	1,455 (2,303)	1,480 (808)
PSID-3 <sup>g</sup>	1,069 (899)	825 (1,104)	647 (1,383)	2,321 (1,994)	1,870 (2,002)	247	2,120 (2,335)	1,549 (826)
CPS-1 <sup>h</sup>	-8,498 (712)	972 (550)	1,117 (747)	1,713 (1,115)	1,774 (1,152)	4,117	1,582 (1,069)	1,616 (751)
CPS-2 <sup>h</sup>	-3,822 (670)	790 (658)	505 (847)	1,543 (1,461)	1,622 (1,346)	1,493	1,788 (1,205)	1,563 (753)
CPS-3 <sup>h</sup>	-635 (657)	1,326 (798)	556 (951)	1,252 (1,617)	2,219 (2,082)	514	587 (1,496)	662 (776)

# Bolstering Methods

Table 5

Bias associated with alternative cross-sectional matching estimators. Comparison groups: (A) CPS male sample and (B) PSID male sample. Dependent variable: real earnings in 1978 (bootstrap standard errors in parentheses; trimming level for common support is 2 percent)

Sample and propensity score model	(1) Mean diff.	(2) 1 Nearest neighbor without common support	(3) 10 Nearest-neighbors without common support	(4) 1 Nearest-neighbor with common support	(5) 10 Nearest-neighbors with common support	(6) Local linear matching (bw = 1.0)	(7) Local linear matching (bw = 4.0)	(8) Local linear regression adjusted matching <sup>a</sup> (bw = 1.0)	(9) Local linear regression adjusted matching (bw = 4.0)
<i>(A) Comparison group: CPS male sample</i>									
LaLonde sample with DW prop. score model	-9757 (255)	-555 (596)	-270 (493)	-838 (628)	-1299 (529)	-1380 (437)	-1431 (441)	-1406 (490)	-1329 (441)
As % of \$886 impact	-1101% (29)	-63% (67)	-30% (56)	-95% (71)	-147% (60)	-156% (49)	-162% (50)	-159% (55)	-150% (50)
DW sample with DW prop. score model	-10291 (306)	407 (698)	-5 (672)	-27 (723)	-261 (593)	-88 (630)	-67 (611)	-127 (709)	-96 (643)
As % of \$1794 impact	-574% (17)	23% (39)	-0.3% (37)	-1.5% (40)	-15% (33)	-5% (35)	-4% (34)	-5% (40)	-7% (36)
Early RA sample with DW prop. score model	-11101 (461)	-7781 (1245)	-3632 (1354)	-5417 (1407)	-2396 (1152)	-3427 (1927)	-2191 (1069)	-3065 (3890)	-3391 (1124)
As % of \$2748 impact	-404% (17)	-283% (45)	-132% (49)	-197% (51)	-87% (42)	-125% (70)	-80% (39)	-112% (142)	-123% (41)
LaLonde sample with LaLonde prop. score model	-10227 (296)	-3602 (1459)	-2122 (1299)	-3586 (1407)	-2342 (1165)	-3562 (3969)	-2708 (1174)	-3435 (4207)	-2362 (1178)
As % of \$886 impact	-1154% (33)	-406% (165)	-240% (147)	405% (159)	264% (131)	402% (448)	306% (133)	388% (474)	-266% (133)

# Installing and Using R

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