

Log Files for:

Marc Höglinger, Ben Jann (2016). More Is Not Always Better: An Experimental Individual-Level Validation of the Randomized Response Technique and the Crosswise Model. University of Bern Social Sciences Working Paper No. 18 (<https://ideas.repec.org/p/bss/wpaper/18.html>).

Software: Stata/MP 14.1 (required user packages: `fre`, `estout`, `estwrite`)

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1 Sample selection and descriptive statistics

```
. use ASQ-MTurk-2013.dta
(MTurk Survey on "Mood and Personality" 2013)
. set seed 863991 // for bootstrap
. global reps 1000 // for bootstrap
```

1.1 Response rates

```
. mat R = J(5,2,.)
. mat coln R = "N" "RR"
. mat rown R = "Sample" "Started2" "Completed" "Completed2" "SQ"
. qui count
. mat R[1,1] = r(N), 1
. qui count if submit2!=.b // submitted first page with questions
. mat R[2,1] = r(N), r(N)/R[1,1]
. qui count if completed==1
. mat R[3,1] = r(N), r(N)/R[1,1]
. qui count if submit21!=.b // submitted last page with questions (before resp` comments)
. mat R[4,1] = r(N), r(N)/R[1,1]
. qui count if senstec<. // reached first page after sensitive question intro
. mat R[5,1] = r(N), r(N)/R[1,1]
.
. // Sample: Gross sample = Accepted HIT & started survey
. // Started2: Submitted at least the first page containing questions
. // Completed: Completed questionnaire to very end
. // Completed2: Completed the questionnaire to last page containing questions
. // SQ: Submitted at least sensitive questions introduction page
. mat list R
R[5,2]
      N      RR
Sample 6505      1
Started2 6495 .99846272
Completed 6461 .99323597
Completed2 6461 .99323597
SQ 6473 .99508071
```

1.2 Create dummies for experimental conditions

```
. fre senstec
senstec — Sensitive question technique assignment
```

		Freq.	Percent	Valid	Cum.
Valid	1 DQ	810	12.45	12.51	12.51
	2 CMquest	2438	37.48	37.66	50.18
	3 UQbenf	1618	24.87	25.00	75.17
	4 FRnumb	1607	24.70	24.83	100.00
	Total	6473	99.51	100.00	
Missing	.b break-off	32	0.49		
Total		6505	100.00		

```
. gen byte DQ = senstec==1 if senstec<.
(32 missing values generated)
. gen byte CM = senstec==2 if senstec<.
```

```

(32 missing values generated)
. gen byte UQ = senstec==3 if senstec<.
(32 missing values generated)
. gen byte FR = senstec==4 if senstec<.
(32 missing values generated)
. fre DQ CM UQ FR

```

DQ

		Freq.	Percent	Valid	Cum.
Valid	0	5663	87.06	87.49	87.49
	1	810	12.45	12.51	100.00
	Total	6473	99.51	100.00	
Missing	.	32	0.49		
Total		6505	100.00		

CM

		Freq.	Percent	Valid	Cum.
Valid	0	4035	62.03	62.34	62.34
	1	2438	37.48	37.66	100.00
	Total	6473	99.51	100.00	
Missing	.	32	0.49		
Total		6505	100.00		

UQ

		Freq.	Percent	Valid	Cum.
Valid	0	4855	74.63	75.00	75.00
	1	1618	24.87	25.00	100.00
	Total	6473	99.51	100.00	
Missing	.	32	0.49		
Total		6505	100.00		

FR

		Freq.	Percent	Valid	Cum.
Valid	0	4866	74.80	75.17	75.17
	1	1607	24.70	24.83	100.00
	Total	6473	99.51	100.00	
Missing	.	32	0.49		
Total		6505	100.00		

```

. texdoc stlog close
{smcl}

```

1.3 Sample selection

```

. * exclude respondents who did not reach first page of assigned sensitive question technique
. keep if senstec<.
(32 observations deleted)

.
. * screening question
. gen str tmp = lower(strtrim(strtrim(q2txt)))
(201 missing values generated)
. replace tmp = substr(tmp, `""', "", .)
(12 real changes made)
. replace tmp = substr(tmp, `".', "", .)
(9 real changes made)

```

```

. replace tmp = substr(tmp, `!"`, "", .)
(8 real changes made)
. replace tmp = substr(tmp, `"`, "", .)
(72 real changes made)
. replace tmp = substr(tmp, `'"`, "", .)
(11 real changes made)
. replace tmp = substr(tmp, `'"`, "", .)
(10 real changes made)
. gen byte passed = tmp=="got it"
. foreach s in "get it" "git it" "go it" "god it" "gor it" "got" "got lt" "got ot" "got t" {
  2.   replace passed = 1 if tmp=="`s`"
  3. }
(1 real change made)
(4 real changes made)
(8 real changes made)
(1 real change made)
(1 real change made)
(3 real changes made)
(1 real change made)
(2 real changes made)
(1 real change made)
. fre tmp if passed==0

```

tmp

		Freq.	Percent	Valid	Cum.
Valid	mood	1	0.49	25.00	25.00
	mood and personality	1	0.49	25.00	50.00
	paying attention	1	0.49	25.00	75.00
	personality	1	0.49	25.00	100.00
	Total	4	1.95	100.00	
Missing		201	98.05		
Total		205	100.00		

```

. fre tmp if passed==1

```

tmp

		Freq.	Percent	Valid	Cum.
Valid	get it	1	0.02	0.02	0.02
	git it	4	0.06	0.06	0.08
	go it	8	0.13	0.13	0.21
	god it	1	0.02	0.02	0.22
	gor it	1	0.02	0.02	0.24
	got	3	0.05	0.05	0.29
	got it	6246	99.65	99.65	99.94
	got lt	1	0.02	0.02	99.95
	got ot	2	0.03	0.03	99.98
	got t	1	0.02	0.02	100.00
	Total	6268	100.00	100.00	

```

. fre passed

```

passed

		Freq.	Percent	Valid	Cum.
Valid	0	205	3.17	3.17	3.17
	1	6268	96.83	96.83	100.00
	Total	6473	100.00	100.00	

```

. drop tmp

```

```

. keep if passed

```

(205 observations deleted)

```

. drop passed

```

```

.
. * exclude respondents for whom no dice roll was recorded (could be because the
. * die was not/could not be rolled or because there was a recording error)
. gen byte rollrec = q6_rollcount!=0 if q6_rollcount<.
. fre rollrec
rollrec

```

		Freq.	Percent	Valid	Cum.
Valid	0	115	1.83	1.83	1.83
	1	6153	98.17	98.17	100.00
	Total	6268	100.00	100.00	

```

. keep if rollrec
(115 observations deleted)
. drop rollrec
.
. * exclude one roll-a-six participant with predefined six not claiming his legitimate bonus
. fre q6_roll1 if dicegame==2
q6_roll1 — Predefined outcome roll 1

```

		Freq.	Percent	Valid	Cum.
Valid	1	515	16.73	16.73	16.73
	2	547	17.77	17.77	34.49
	3	516	16.76	16.76	51.25
	4	498	16.17	16.17	67.42
	5	487	15.82	15.82	83.24
	6	516	16.76	16.76	100.00
	Total	3079	100.00	100.00	

```

. drop if q6==0 & q6_roll1==6 & dicegame==2
(1 observation deleted)
.
. count
6,152

```

1.4 Response time

```

. gen duration = seconds(enddate - startdate)
. su duration, detail

```

duration				
Percentiles	Smallest			
1%	181	118		
5%	227	119		
10%	261	124	Obs	6,152
25%	321	130	Sum of Wgt.	6,152
50%	401		Mean	448.1977
		Largest	Std. Dev.	236.0526
75%	515	3164		
90%	662	4556	Variance	55720.83
95%	791	5128	Skewness	6.201485
99%	1256	5500	Kurtosis	91.2505

```

. di r(p50)/60
6.6833333
. drop duration

```

1.5 Number of observations per technique, item, and game

```
. lab def senstec 2 "CM" 3 "UQ" 4 "FR", modify
. table dicegame senstec, c(freq) row col
```

Dice game assignment	Sensitive question technique assignment				
	DQ	CM	UQ	FR	Total
prediction	387	1,168	760	759	3,074
roll-a-six	382	1,145	780	771	3,078
Total	769	2,313	1,540	1,530	6,152

```
. qui estpost tabstat q14 q15 q16 q17, s(count) by(senstec) columns(statistics)
. esttab, cell(count) unstack collab(none) nonumb nomti noobs compress ///
> title("N by sensitive item and technique")
```

N by sensitive item and technique

	DQ	CM	UQ	FR	Total
q14	768	2313	1534	1521	6136
q15	768	2310	1532	1526	6136
q16	766	2306	1534	1525	6131
q17	768	2306	1535	1526	6135

```
. foreach v in q14 q15 q16 q17 {
2. gen _mis_`v` = (`v`>=.)*100
3. }
. qui estpost tabstat _mis_*, by(senstec) columns(statistics)
. estout, cell(mean(f(%9.2f))) unstack collab(none) mlab(none) ///
> title("Item nonresponse (percent)")
```

Item nonresponse (percent)

	DQ	CM	UQ	FR	Total
_mis_q14	0.13	0.00	0.39	0.59	0.26
_mis_q15	0.13	0.13	0.52	0.26	0.26
_mis_q16	0.39	0.30	0.39	0.33	0.34
_mis_q17	0.13	0.30	0.32	0.26	0.28

```
. drop _mis_*
```

1.6 Descriptive statistics

1.6.1 Sex

```
. fre q9_3
q9_3 — Gender
```

		Freq.	Percent	Valid	Cum.
Valid	1 Male	3066	49.84	49.91	49.91
	2 Female	3077	50.02	50.09	100.00
	Total	6143	99.85	100.00	
Missing	.a no answer	9	0.15		
Total		6152	100.00		

1.6.2 Age

```
. fre q9_3
q9_3 — Gender
```

	Freq.	Percent	Valid	Cum.
Valid 1 Male	3066	49.84	49.91	49.91
2 Female	3077	50.02	50.09	100.00
Total	6143	99.85	100.00	
Missing .a no answer	9	0.15		
Total	6152	100.00		

```
. gen age = q9_2 if q9_2<100
(6,133 missing values generated)
. replace age = 2013 - q9_2 + 1 if q9_2>1900
(6,130 real changes made)
. replace age = 2013 - 1972 + 1 if q9_2==172
(1 real change made)
. replace age = 2013 - 1994 + 1 if q9_2==194
(1 real change made)
. replace age = 2013 - 1960 + 1 if q9_2==1060
(1 real change made)
. compress age
variable age was double now byte
(43,064 bytes saved)
. fre age
age
```

	Freq.	Percent	Valid	Cum.
Valid 18	4	0.07	0.07	0.07
19	81	1.32	1.32	1.38
20	171	2.78	2.78	4.16
21	223	3.62	3.62	7.79
22	296	4.81	4.81	12.60
23	326	5.30	5.30	17.90
24	394	6.40	6.40	24.30
25	364	5.92	5.92	30.22
26	343	5.58	5.58	35.79
27	343	5.58	5.58	41.37
28	314	5.10	5.10	46.47
29	298	4.84	4.84	51.32
30	263	4.28	4.28	55.59
31	240	3.90	3.90	59.49
32	223	3.62	3.62	63.12
33	203	3.30	3.30	66.42
34	209	3.40	3.40	69.81
35	170	2.76	2.76	72.58
36	153	2.49	2.49	75.07
37	130	2.11	2.11	77.18
:	:	:	:	:
59	31	0.50	0.50	97.06
60	31	0.50	0.50	97.56
61	20	0.33	0.33	97.89
62	27	0.44	0.44	98.33
63	13	0.21	0.21	98.54
64	12	0.20	0.20	98.73
65	10	0.16	0.16	98.89
66	14	0.23	0.23	99.12
67	15	0.24	0.24	99.37
68	10	0.16	0.16	99.53
69	7	0.11	0.11	99.64
70	5	0.08	0.08	99.72
71	4	0.07	0.07	99.79

72	1	0.02	0.02	99.80
73	5	0.08	0.08	99.89
74	2	0.03	0.03	99.92
75	1	0.02	0.02	99.93
76	1	0.02	0.02	99.95
77	2	0.03	0.03	99.98
82	1	0.02	0.02	100.00
Total	6152	100.00	100.00	

```
. su age, detail
```

age				
Percentiles		Smallest		
1%	19	18		
5%	21	18		
10%	22	18	Obs	6,152
25%	25	18	Sum of Wgt.	6,152
50%	29		Mean	32.2934
		Largest		Std. Dev.
75%	36	76		10.6223
90%	49	77	Variance	112.8333
95%	56	77	Skewness	1.346843
99%	66	82	Kurtosis	4.496818

```
. egen agecat = cut(age), at(18, 25, 30, 35, 40, 50, 100)
```

```
. fre agecat
```

```
agecat
```

		Freq.	Percent	Valid	Cum.
Valid	18	1495	24.30	24.30	24.30
	25	1662	27.02	27.02	51.32
	30	1138	18.50	18.50	69.81
	35	660	10.73	10.73	80.54
	40	624	10.14	10.14	90.69
	50	573	9.31	9.31	100.00
Total	6152	100.00	100.00		

```
. drop agecat
```

1.6.3 Education

```
. replace q9_1=2 if q9_1txt=="GED" // General educational development test, similar to highschool
(9 real changes made)
. replace q9_1=6 if q9_1txt=="JD" // Juris Doctor, professional doctorate
(3 real changes made)
. replace q9_1=2 if q9_1txt=="Trade school"
(1 real change made)
. replace q9_1=3 if q9_1txt=="college diploma"
(1 real change made)
. replace q9_1=1 if q9_1txt=="Currently in High School"
(1 real change made)
. replace q9_1=6 if q9_1txt=="M.D" // Medicinae Doctor
(1 real change made)
. replace q9_1=7 if q9_1txt=="culinary school graduate"
(0 real changes made)
. replace q9_1=3 if q9_1txt=="currently studying for bachelor's"
(1 real change made)
. replace q9_1=5 if q9_1txt=="BS, RCP,(Respiratory Care Practitioner)"
(1 real change made)
. replace q9_1=2 if q9_1txt=="Trade School"
```



```

(1 real change made)
. replace q9_1=5 if q9_1txt=="Master`s degree in progress"
(1 real change made)
. replace q9_1=6 if q9_1txt=="jd"
(1 real change made)
. replace q9_1=7 if q9_1txt=="37 Certificates in Information Technologies"
(0 real changes made)
. replace q9_1=6 if q9_1txt=="MD"
(2 real changes made)
. replace q9_1=6 if q9_1txt=="J.D."
(2 real changes made)
. replace q9_1=2 if q9_1txt=="trade school"
(2 real changes made)
. replace q9_1=5 if q9_1txt=="Undergraduate/Student"
(1 real change made)
. replace q9_1=7 if q9_1txt=="Ed.S"
(0 real changes made)
. replace q9_1=3 if q9_1txt=="Still attending college-Junior"
(1 real change made)
. replace q9_1=7 if q9_1txt=="Tech School"
(0 real changes made)
. replace q9_1=7 if q9_1txt=="Current student"
(0 real changes made)
. replace q9_1=2 if q9_1txt=="Vocational school"
(0 real changes made)
. replace q9_1=3 if q9_1txt=="Student in college"
(1 real change made)
. replace q9_1=5 if q9_1txt=="Current Graduate Student"
(1 real change made)
. replace q9_1=2 if q9_1txt=="medical assistant certification"
(1 real change made)
. replace q9_1=5 if q9_1txt=="Some graduate school"
(2 real changes made)
. replace q9_1=5 if q9_1txt=="Some Master`s-Speech Pathology"
(1 real change made)
. replace q9_1=5 if q9_1txt=="Some graduate school"
(0 real changes made)
. replace q9_1=7 if q9_1txt=="Student"
(0 real changes made)
. replace q9_1=2 if q9_1txt=="Vocational Certificate after high school diploma"
(0 real changes made)
. replace q9_1=7 if q9_1txt=="State Board Cosmetology license"
(0 real changes made)
. replace q9_1=2 if q9_1txt=="some high school , GED"
(1 real change made)
. replace q9_1=6 if q9_1txt=="professional degree J.D."
(1 real change made)
. replace q9_1=7 if q9_1txt=="tech school"
(0 real changes made)
. replace q9_1=3 if q9_1txt=="Completing bachelor`s"
(1 real change made)
. replace q9_1=2 if q9_1txt=="AT-CTI program for Air Traffic Control"
(1 real change made)
. replace q9_1=2 if q9_1txt=="Certificate of Completion (trade)"
(1 real change made)
. replace q9_1=3 if q9_1txt=="Currently in College"
(1 real change made)
. replace q9_1=3 if q9_1txt=="In college- BA History"
(1 real change made)

```

```

. replace q9_1=3 if q9_1txt=="Current undergrad (senior) completing BS and BA"
(1 real change made)
. replace q9_1=6 if q9_1txt=="Pharm.D"
(1 real change made)
. replace q9_1=6 if q9_1txt=="MD"
(0 real changes made)
. replace q9_1=7 if q9_1txt=="Technical training, HS deploma"
(0 real changes made)
. replace q9_1=5 if q9_1txt=="enrolled in master's program"
(1 real change made)
. replace q9_1=3 if q9_1txt=="In college now for my Bachelor's"
(1 real change made)
. replace q9_1=2 if q9_1txt=="Vocational degree - LPN"
(1 real change made)
. replace q9_1=7 if q9_1txt=="Certificate from cosmetology"
(0 real changes made)
. replace q9_1=3 if q9_1txt=="currently working on my Associate"
(1 real change made)
. replace q9_1=2 if q9_1txt=="trade school"
(0 real changes made)
. replace q9_1=7 if q9_1txt=="tech school - completed"
(0 real changes made)
. replace q9_1=3 if q9_1txt=="Still in college"
(1 real change made)
. replace q9_1=3 if q9_1txt=="trade school certificate and some college"
(1 real change made)
. replace q9_1=7 if q9_1txt=="technical school"
(0 real changes made)
. replace q9_1=3 if q9_1txt=="College"
(0 real changes made)
. replace q9_1=2 if q9_1txt=="Vocational Degree"
(1 real change made)
. replace q9_1=3 if q9_1txt=="currently in college"
(1 real change made)
. replace q9_1=7 if q9_1txt=="EMT-B Licensed"
(0 real changes made)
. replace q9_1=2 if q9_1txt=="Vocational/Certification"
(1 real change made)
. replace q9_1=2 if q9_1txt=="G.E.D."
(1 real change made)
. replace q9_1=2 if q9_1txt=="GED, overall average 656"
(0 real changes made)
. replace q9_1=3 if q9_1txt=="College, on going"
(1 real change made)
. gen byte educ = 1 if inlist(q9_1, 4, 5, 6)
(2,835 missing values generated)
. replace educ = 2 if inlist(q9_1, 3)
(2,103 real changes made)
. replace educ = 3 if inlist(q9_1, 1, 2, 7)
(728 real changes made)
. lab def educ 1 "college degree" 2 "some college" 3 "high school or other"
. lab val educ educ
. fre educ
educ

```

		Freq.	Percent	Valid	Cum.
Valid	1 college degree	3317	53.92	53.95	53.95

2 some college	2103	34.18	34.21	88.16
3 high school or other	728	11.83	11.84	100.00
Total	6148	99.93	100.00	
Missing .	4	0.07		
Total	6152	100.00		

1.6.4 Employment status

```
. d q10_2*
variable name      storage   display   value
                  type      format    label    variable label
-----
q10_2_1           byte     %12.0g   q10_2_1  Currently employed
q10_2_2           byte     %12.0g   q10_2_2  Currently self-employed
q10_2_3           byte     %12.0g   q10_2_3  Currently out of work and looking for work
q10_2_4           byte     %12.0g   q10_2_4  Currently homemaker
q10_2_5           byte     %12.0g   q10_2_5  Currently student
q10_2_6           byte     %12.0g   q10_2_6  Currently retired
q10_2_7           byte     %12.0g   q10_2_7  Currently other
q10_2_7txt        str108   %9s      q10_2_7  Currently other (text)

. gen byte lfp = .
(6,152 missing values generated)

. replace lfp = 1 if q10_2_1==1 & lfp==. // employed
(3,321 real changes made)

. replace lfp = 2 if q10_2_2==1 & lfp==. // selfemployed
(777 real changes made)

. replace lfp = 3 if q10_2_3==1 & lfp==. // unemployed
(695 real changes made)

. replace lfp = 4 if q10_2_5==1 & lfp==. // student
(800 real changes made)

. replace lfp = 5 if (q10_2_4==1 | q10_2_6==1 | q10_2_7==1) & lfp==. // other
(546 real changes made)

. lab def lfp 1 "employed" 2 "self-employed" 3 "unemployed" 4 "student" 5 "other"
. lab val lfp lfp
. fre lfp
lfp
```

		Freq.	Percent	Valid	Cum.
Valid	1 employed	3321	53.98	54.10	54.10
	2 self-employed	777	12.63	12.66	66.75
	3 unemployed	695	11.30	11.32	78.07
	4 student	800	13.00	13.03	91.11
	5 other	546	8.88	8.89	100.00
	Total	6139	99.79	100.00	
Missing .		13	0.21		
Total		6152	100.00		

1.6.5 Location at time of interview

```
. fre q10_3
q10_3 — Actual location: categorized
```

		Freq.	Percent	Valid	Cum.
Valid	1 at home	5251	85.35	85.38	85.38
	2 at workplace/office	607	9.87	9.87	95.25

3	in a cafe/restaurant	41	0.67	0.67	95.92
4	at school/university	147	2.39	2.39	98.31
5	travelling	10	0.16	0.16	98.47
6	other (please specify)	94	1.53	1.53	100.00
	Total	6150	99.97	100.00	
Missing	.a no answer	2	0.03		
	Total	6152	100.00		

```

. gen byte location = 1 if q10_3==1
(901 missing values generated)
. replace location = 2 if q10_3==2
(607 real changes made)
. replace location = 3 if inlist(q10_3,3,4,5,6)
(292 real changes made)
. lab def location 1 "at home" 2 "at workplace" 3 "other"
. lab val location location
. fre location
location

```

		Freq.	Percent	Valid	Cum.
Valid	1 at home	5251	85.35	85.38	85.38
	2 at workplace	607	9.87	9.87	95.25
	3 other	292	4.75	4.75	100.00
	Total	6150	99.97	100.00	
Missing	.	2	0.03		
	Total	6152	100.00		

1.6.6 Prior exposure to MTurk studies

```

. replace q10_1 = lower(q10_1)
(15 real changes made)
. replace q10_1 = substr(q10_1, "", "", 1)
(12 real changes made)
. replace q10_1 = substr(q10_1, "-", "", 1)
(23 real changes made)
. replace q10_1 = substr(q10_1, ">", "", 1)
(12 real changes made)
. replace q10_1 = substr(q10_1, "<", "", 1)
(3 real changes made)
. replace q10_1 = substr(q10_1, "?", "", 1)
(15 real changes made)
. replace q10_1 = substr(q10_1, "+", "", 1)
(90 real changes made)
. replace q10_1 = substr(q10_1, "over ", "", 1)
(4 real changes made)
. replace q10_1 = substr(q10_1, " times", "", 1)
(6 real changes made)
. replace q10_1 = substr(q10_1, "about ", "", 1)
(4 real changes made)
. replace q10_1 = substr(q10_1, "maybe around ", "", 1)
(1 real change made)
. replace q10_1 = substr(q10_1, "around ", "", 1)
(1 real change made)
. replace q10_1 = substr(q10_1, "approx ", "", 1)
(1 real change made)
. replace q10_1 = substr(q10_1, "approx. ", "", 1)
(1 real change made)

```

```

. replace q10_1 = substr(q10_1, "approximately ", "", 1)
(1 real change made)
. replace q10_1 = substr(q10_1, " i think", "", 1)
(1 real change made)
. replace q10_1 = substr(q10_1, " or more", "", 1)
(2 real changes made)
. replace q10_1 ="10"      if q10_1=="10-11"
(1 real change made)
. replace q10_1 ="12"      if q10_1=="10-15"
(1 real change made)
. replace q10_1 ="15"      if q10_1=="10-20"
(1 real change made)
. replace q10_1 ="100"     if q10_1=="100s"
(1 real change made)
. replace q10_1 ="100"     if q10_1=="100s"
(2 real changes made)
. replace q10_1 ="17"      if q10_1=="15-20"
(2 real changes made)
. replace q10_1 ="22"      if q10_1=="15-30"
(1 real change made)
. replace q10_1 ="3"       if q10_1=="2-5"
(1 real change made)
. replace q10_1 ="27"      if q10_1=="25-30"
(1 real change made)
. replace q10_1 ="3"       if q10_1=="3-4"
(2 real changes made)
. replace q10_1 ="4"       if q10_1=="3-5"
(2 real changes made)
. replace q10_1 ="40"      if q10_1=="30-50"
(1 real change made)
. replace q10_1 ="40"      if q10_1=="40 or so"
(1 real change made)
. replace q10_1 ="47"      if q10_1=="45-50"
(1 real change made)
. replace q10_1 ="7"       if q10_1=="5-10"
(2 real changes made)
. replace q10_1 ="75"      if q10_1=="50-100"
(1 real change made)
. replace q10_1 ="50"      if q10_1=="50x"
(1 real change made)
. replace q10_1 ="80"      if q10_1=="80ish"
(1 real change made)
. replace q10_1 ="978"     if q10_1=="978 approved hits"
(1 real change made)
. replace q10_1 =" "       if q10_1=="a lot"
(1 real change made)
. replace q10_1 =" "       if q10_1=="alot"
(1 real change made)
. replace q10_1 =" "       if q10_1=="couple"
(1 real change made)
. replace q10_1 =" "       if q10_1=="don't know"
(2 real changes made)
. replace q10_1 =" "       if q10_1=="dont know"
(1 real change made)
. replace q10_1 ="100"     if q10_1=="hundreds"
(1 real change made)
. replace q10_1 =" "       if q10_1=="i don't know. this isn't the first one though."
(1 real change made)

```

```

. replace q10_1 =""      if q10_1=="lots"
(2 real changes made)
. replace q10_1 =""      if q10_1=="lots -- cannot count"
(1 real change made)
. replace q10_1 =""      if q10_1=="lots!"
(1 real change made)
. replace q10_1 =""      if q10_1=="many"
(4 real changes made)
. replace q10_1 ="0"     if q10_1=="no"
(2 real changes made)
. replace q10_1 ="0"     if q10_1=="none"
(1 real change made)
. replace q10_1 =""      if q10_1=="not sure"
(6 real changes made)
. replace q10_1 ="20"    if q10_1=="not sure. 20 maybe"
(1 real change made)
. replace q10_1 =""      if q10_1=="numerous"
(1 real change made)
. replace q10_1 =""      if q10_1=="often"
(1 real change made)
. replace q10_1 ="1"     if q10_1=="one other study"
(1 real change made)
. replace q10_1 =""      if q10_1=="several"
(1 real change made)
. replace q10_1 =""      if q10_1=="started this week"
(1 real change made)
. replace q10_1 ="1000"  if q10_1=="thousands"
(1 real change made)
. destring q10_1, replace
q10_1 has all characters numeric; replaced as long
(45 missing values generated)
. su q10_1, detail

```

Number of MTurk studies attended

Percentiles		Smallest		
1%	0	0		
5%	0	0		
10%	1	0	Obs	6,107
25%	7	0	Sum of Wgt.	6,107
50%	50		Mean	547.4488
		Largest	Std. Dev.	4349.993
75%	250	60000		
90%	1000	90000	Variance	1.89e+07
95%	2000	150557	Skewness	38.34398
99%	7100	244001	Kurtosis	1882.163

```

. egen exposure = cut(q10_1), at(0, 1, 10, 100, 1000, 250000)
(45 missing values generated)

```

```

. compress exposure
variable exposure was double now int
(36,912 bytes saved)

```

```

. fre exposure

```

```

exposure

```

		Freq.	Percent	Valid	Cum.
Valid	0	413	6.71	6.76	6.76
	1	1181	19.20	19.34	26.10
	10	2008	32.64	32.88	58.98
	100	1847	30.02	30.24	89.23
	1000	658	10.70	10.77	100.00
	Total	6107	99.27	100.00	

Missing .	45	0.73
Total	6152	100.00

2 Main analysis

2.1 Prepare sensitive items

```
. d q14 q15 q16 q17
      storage   display   value
variable name  type      format   label   variable label
-----
q14            byte      %13.0g   q14     Have you ever intentionally taken something from a
           store without paying for it?
q15            byte      %13.0g   q15     Have you ever provided misleading or incorrect
           information on your tax return?
q16            byte      %13.0g   q16     Did you vote in the 2012 US presidential election?
q17            byte      %13.0g   q17     Did you honestly report whether your prediction was
           right?/you rolled a 6?

. gen byte shoplift = q14
(16 missing values generated)
. gen shoplift_p1   = (1-q14_pno) * q14_pcm
(1 missing value generated)
. gen shoplift_p0   = q14_pyes + (1-q14_pcm)
(1 missing value generated)
. gen byte taxeva  = q15
(16 missing values generated)
. gen taxeva_p1    = (1-q15_pno) * q15_pcm
(5 missing values generated)
. gen taxeva_p0    = q15_pyes + (1-q15_pcm)
(5 missing values generated)
. gen byte nonvote = 1 - q16
(21 missing values generated)
. gen nonvote_p1   = (1-q16_pyes) * q16_pcm
(7 missing values generated)
. gen nonvote_p0   = q16_pno + (1-q16_pcm)
(7 missing values generated)
. gen byte cheat   = 1 - q17
(17 missing values generated)
. gen cheat_p1     = (1-q17_pyes) * q17_pcm
(8 missing values generated)
. gen cheat_p0     = q17_pno + (1-q17_pcm)
(8 missing values generated)
```

2.2 Comparative validation

```
. capt prog drop rrt
. program rrt, eclass
1.     syntax varname [if] [in] [aw fw iw pw], p1(varname) p0(varname) [ * ]
2.     tempvar depvar
3.     qui gen `depvar' = (`varlist' - (`p0`)) / ((`p1`) - (`p0`))
4.     qui mean `depvar' `if' `in' [`weight' `exp'], `options'
5.     tempname b
6.     mat `b' = e(b)
7.     local eqs
8.     local N_over = e(N_over)
```

```

9.     mat coleq `b' = `varlist'
10.    eret repost b=`b', rename
11.    mean
12. end

.
. foreach v in shoplift taxeva nonvote {
2.     di _n as res `"'=> `v'"`
3.     rrt `v', over(senstec) p1(`v'_p1) p0(`v'_p0)
4.     est sto `v'
5.     nlcom (CM: _b[CM]-_b[DQ]) (UQ: _b[UQ]-_b[DQ]) (FR: _b[FR]-_b[DQ]), post
6.     est sto d`v'
7. }

```

```

==> shoplift
Mean estimation           Number of obs   =       6,136
      DQ: senstec = DQ
      CM: senstec = CM
      UQ: senstec = UQ
      FR: senstec = FR

```

Over	Mean	Std. Err.	[95% Conf. Interval]	
shoplift				
DQ	.4023438	.0177063	.3676333	.4370542
CM	.4641868	.0162203	.4323894	.4959842
UQ	.5453174	.0163735	.5132195	.5774152
FR	.49222	.0170557	.4587849	.5256551

```

CM: _b[CM]-_b[DQ]
UQ: _b[UQ]-_b[DQ]
FR: _b[FR]-_b[DQ]

```

Mean	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
CM	.061843	.0240127	2.58	0.010	.0147791	.108907
UQ	.1429736	.0241165	5.93	0.000	.0957062	.190241
FR	.0898763	.0245847	3.66	0.000	.0416912	.1380614

```

==> taxeva
Mean estimation           Number of obs   =       6,136
      DQ: senstec = DQ
      CM: senstec = CM
      UQ: senstec = UQ
      FR: senstec = FR

```

Over	Mean	Std. Err.	[95% Conf. Interval]	
taxeva				
DQ	.1002604	.0108449	.0790006	.1215202
CM	.1952329	.0149807	.1658655	.2246004
UQ	.176287	.014159	.1485305	.2040436
FR	.1430028	.0152268	.113153	.1728525

```

CM: _b[CM]-_b[DQ]
UQ: _b[UQ]-_b[DQ]
FR: _b[FR]-_b[DQ]

```

Mean	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
CM	.0949725	.0184941	5.14	0.000	.0587247	.1312204
UQ	.0760266	.017835	4.26	0.000	.0410706	.1109826
FR	.0427424	.018694	2.29	0.022	.0061028	.0793819

```

==> nonvote

```



```

Mean estimation                Number of obs   =       6,131
      DQ: senstec = DQ
      CM: senstec = CM
      UQ: senstec = UQ
      FR: senstec = FR

```

Over	Mean	Std. Err.	[95% Conf. Interval]	
nonvote				
DQ	.3446475	.0171828	.3109632	.3783319
CM	.3810852	.0160718	.3495788	.4125916
UQ	.3474351	.0159523	.3161631	.3787071
FR	.3251002	.0168013	.2921637	.3580367

```

CM:  _b[CM]-_b[DQ]
UQ:  _b[UQ]-_b[DQ]
FR:  _b[FR]-_b[DQ]

```

Mean	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
CM	.0364377	.0235277	1.55	0.121	-.0096758	.0825511
UQ	.0027876	.0234462	0.12	0.905	-.0431661	.0487413
FR	-.0195473	.0240319	-0.81	0.416	-.066649	.0275544

```

. local i 0
. foreach g in predict roll6 {
2.     local ++i
3.     di _n as res `"'=> dicegame = `:lab dicegame `i`"'
4.     rrt cheat if dicegame==`i`, over(senstec) p1(cheat_p1) p0(cheat_p0)
5.     est sto `g`
6.     nlcom (CM: _b[CM]-_b[DQ]) (UQ: _b[UQ]-_b[DQ]) (FR: _b[FR]-_b[DQ]), post
7.     est sto d`g`
8. }

```

```
==> dicegame = prediction
```

```

Mean estimation                Number of obs   =       3,065
      DQ: senstec = DQ
      CM: senstec = CM
      UQ: senstec = UQ
      FR: senstec = FR

```

Over	Mean	Std. Err.	[95% Conf. Interval]	
cheat				
DQ	.0232558	.0076712	.0082146	.038297
CM	.1540808	.0205389	.1138093	.1943523
UQ	.0373548	.0162843	.0054256	.069284
FR	.0085131	.0183445	-.0274555	.0444818

```

CM:  _b[CM]-_b[DQ]
UQ:  _b[UQ]-_b[DQ]
FR:  _b[FR]-_b[DQ]

```

Mean	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
CM	.1308249	.0219248	5.97	0.000	.0878532	.1737967
UQ	.014099	.0180007	0.78	0.433	-.0211817	.0493796
FR	-.0147427	.0198838	-0.74	0.458	-.0537142	.0242289

```
==> dicegame = roll-a-six
```

```

Mean estimation                Number of obs   =       3,070
      DQ: senstec = DQ
      CM: senstec = CM
      UQ: senstec = UQ

```

FR: senstec = FR

Over	Mean	Std. Err.	[95% Conf. Interval]	
cheat				
DQ	.0393701	.0099763	.0198092	.058931
CM	.1433933	.0205794	.1030424	.1837442
UQ	.0522663	.0165942	.0197295	.0848032
FR	-.0193614	.0172802	-.0532433	.0145205

CM: _b[CM]-_b[DQ]
 UQ: _b[UQ]-_b[DQ]
 FR: _b[FR]-_b[DQ]

Mean	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
CM	.1040232	.0228701	4.55	0.000	.0591987	.1488477
UQ	.0128962	.0193622	0.67	0.505	-.0250529	.0508454
FR	-.0587314	.0199532	-2.94	0.003	-.0978391	-.0196238

```
. esttab shoplift taxeva nonvote predict roll6, ///
> nostar mti nonumb eqlab(none) compress transform(@*100 100) b(2) se(2)
```

	shoplift	taxeva	nonvote	predict	roll6
DQ	40.23 (1.77)	10.03 (1.08)	34.46 (1.72)	2.33 (0.77)	3.94 (1.00)
CM	46.42 (1.62)	19.52 (1.50)	38.11 (1.61)	15.41 (2.05)	14.34 (2.06)
UQ	54.53 (1.64)	17.63 (1.42)	34.74 (1.60)	3.74 (1.63)	5.23 (1.66)
FR	49.22 (1.71)	14.30 (1.52)	32.51 (1.68)	0.85 (1.83)	-1.94 (1.73)
N	6136	6136	6131	3065	3070

Standard errors in parentheses

```
. esttab dshoplift dtaxeva dnonvote dpredict droll6, ///
> mti nonumb eqlab(none) compress transform(@*100 100) b(2) se(2)
```

	dshoplift	dtaxeva	dnonvote	dpredict	droll6
CM	6.18* (2.40)	9.50*** (1.85)	3.64 (2.35)	13.08*** (2.19)	10.40*** (2.29)
UQ	14.30*** (2.41)	7.60*** (1.78)	0.28 (2.34)	1.41 (1.80)	1.29 (1.94)
FR	8.99*** (2.46)	4.27* (1.87)	-1.95 (2.40)	-1.47 (1.99)	-5.87** (2.00)
N	6136	6136	6131	3065	3070

Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

```
. estwrite * using comparative-validation, replace
(saving shoplift)
(saving dshoplift)
(saving taxeva)
(saving dtaxeva)
(saving nonvote)
(saving dnonvote)
(saving predict)
(saving dpredict)
(saving roll6)
```

```
(saving droll6)
(file comparative-validation.sters saved)
. estimates clear
```

2.3 Aggregate-level validation

```
. capt prog drop rrt
. program rrt, eclass
1. syntax varlist [if] [in] [aw fw iw pw], p1(varname) p0(varname) [ roll(varname) * ]
2. local claim: word 1 of `varlist'
3. local sq: word 2 of `varlist'
4. tempvar tmp1 tmp2 tmp3
5. if "`roll'"==" " { // => prediction game
6. qui gen `tmp1' = `claim' - 1/6
7. }
8. else { // => roll-a-six game
9. qui gen byte `tmp1' = (`roll'!=6) & (`claim'==1) if `roll'<. & `claim'<.
10. }
11. qui gen `tmp2' = (`sq' - (`p0')) / ((`p1') - (`p0'))
12. qui gen `tmp3' = `tmp2' - `tmp1'
13. qui mean `tmp1' `tmp2' `tmp3' `if' `in' [`weight`exp'], `options'
14. tempname b
15. mat `b' = e(b)
16. local eqs
17. local N_over = e(N_over)
18. foreach eq in cheated estimate difference {
19. forv i=1/`N_over' {
20. local eqs `eqs' `eq'
21. }
22. }
23. mat coleq `b' = `eqs'
24. eret repost b=`b', rename
25. mean
26. end
```

```
. rrt q6 cheat if dicegame==1, over(senstec) p1(cheat_p1) p0(cheat_p0)
```

```
Mean estimation      Number of obs   =      3,065
      DQ: senstec = DQ
      CM: senstec = CM
      UQ: senstec = UQ
      FR: senstec = FR
```

	Over	Mean	Std. Err.	[95% Conf. Interval]	
cheated					
	DQ	.2364341	.0249668	.1874807	.2853876
	CM	.266323	.0145293	.2378349	.2948112
	UQ	.2613386	.0179953	.2260545	.2966227
	FR	.2653016	.0180157	.2299775	.3006257
estimate					
	DQ	.0232558	.0076712	.0082146	.038297
	CM	.1540808	.0205389	.1138093	.1943523
	UQ	.0373548	.0162843	.0054256	.069284
	FR	.0085131	.0183445	-.0274555	.0444818
difference					
	DQ	-.2131783	.0247036	-.2616155	-.1647411
	CM	-.1122423	.02423	-.159751	-.0647336
	UQ	-.2239838	.0230163	-.2691128	-.1788549
	FR	-.2567885	.0248441	-.3055012	-.2080758

```
. eststo pred
```

```
. rrt q6 cheat if dicegame==2, roll(q6_roll1) over(senstec) p1(cheat_p1) p0(cheat_p0)
Mean estimation      Number of obs   =      3,070
```

```
DQ: senstec = DQ
CM: senstec = CM
UQ: senstec = UQ
FR: senstec = FR
```

Over	Mean	Std. Err.	[95% Conf. Interval]	
cheated				
DQ	.0446194	.0105915	.0238522	.0653866
CM	.0604203	.0070537	.0465899	.0742507
UQ	.0501285	.0078282	.0347794	.0654777
FR	.0520156	.0080128	.0363045	.0677267
estimate				
DQ	.0393701	.0099763	.0198092	.058931
CM	.1433933	.0205794	.1030424	.1837442
UQ	.0522663	.0165942	.0197295	.0848032
FR	-.0193614	.0172802	-.0532433	.0145205
difference				
DQ	-.0052493	.0074286	-.0198148	.0093161
CM	.082973	.0207942	.042201	.123745
UQ	.0021378	.0165142	-.0302422	.0345178
FR	-.071377	.0174499	-.1055917	-.0371622

```
. eststo roll6
.
. estwrite * using aggregate-validation, replace
(saving pred)
(saving roll6)
(file aggregate-validation.sters saved)
. estimates clear
```

2.4 Individual-level validation

2.4.1 Prediction game

```
. capt prog drop rrt
. program rrt, eclass
1. syntax varlist [if] [in] [aw fw iw pw], over(varname) p1(varname) p0(varname) [ * ]
2. marksample touse
3. markout `touse' `over' `p1' `p0'
4. local claim: word 1 of `varlist'
5. local sq: word 2 of `varlist'
6. tempvar tmp
7. qui gen `tmp' = (`sq' - (`p0')) / ((`p1' - (`p0')) if `touse'
8. assert (`tmp'<.) if `touse'
9. qui count if `touse'
10. local N = r(N)
11. tempname TPR vTPR FPR vFPR P vP DPR vDPR CCR vCCR
12. qui mean `tmp' if `touse' & `claim'==1 [weight`exp'], over(`over') `options'
13. mat `TPR' = e(b)
14. mat coleq `TPR' = "TPR"
15. mat `vTPR' = e(V)
16. mat coleq `vTPR' = "TPR"
17. mat roweq `vTPR' = "TPR"
18. qui mean `tmp' if `touse' & `claim'==0 [weight`exp'], over(`over') `options'
19. mat `FPR' = e(b)
20. mat coleq `FPR' = "FPR"
21. mat `vFPR' = e(V)
```

```

22. mat coleq `vFPR' = "FPR"
23. mat roweq `vFPR' = "FPR"
24. qui mean `claim' if `touse' [`weight'`exp'], over(`over') `options'
25. mat `P' = e(b)
26. mat coleq `P' = "P"
27. mat `vP' = e(V)
28. mat coleq `vP' = "P"
29. mat roweq `vP' = "P"
30. local N_over = colsof(`P')
31. tempname b V
32. mat `b' = `TPR', `FPR', `P'
33. mat `V' = (`vTPR', `vFPR'*0, `vP'*0) ///
> \ (`vFPR'*0, `vFPR', `vFPR'*0) ///
> \ (`vP'*0, `vP'*0, `vP')
34. eret post `b' `V'
35. local levels: coln `P'
36. local expTPR
37. local expP
38. local expCCR
39. foreach l of local levels {
40. local expTPR `expTPR' ///
> (`l': ([P]_b[`l']*[TPR]_b[`l']-[FPR]_b[`l']/6)/([P]_b[`l']-1/6))
41. local expP `expP' ///
> (`l': [P]_b[`l']-1/6)
42. local expCCR `expCCR' ///
> (`l': (([P]_b[`l']*[TPR]_b[`l']-[FPR]_b[`l']/6)/([P]_b[`l']-1/6))*([P]_b[`l']-1/6) ///
> + (1 - max(0, [FPR]_b[`l']))*(1-([P]_b[`l']-1/6)))
43. }
44. foreach l in TPR P CCR {
45. qui nlcom `exp`l''
46. mat ``l'' = r(b)
47. mat coleq ``l'' = "`l'"
48. mat `v`l'' = r(V)
49. mat coleq `v`l'' = "`l'"
50. mat roweq `v`l'' = "`l'"
51. }
52. mat `b' = `TPR', `FPR', `P', `CCR'
53. mat `V' = (`vTPR', `vFPR'*0, `vP'*0, `vCCR'*0) ///
> \ (`vFPR'*0, `vFPR', `vFPR'*0, `vFPR'*0) ///
> \ (`vP'*0, `vP'*0, `vP', `vP'*0) ///
> \ (`vCCR'*0, `vCCR'*0, `vCCR'*0, `vCCR')
54. eret post `b' `V', obs(`N') esample(`touse')
55. eret scalar N_over = `N_over'
56. eret local cmd "rrt"
57. _coef_table_header
58. eret di
59. end

```

```

. rrt q6 cheat if dicegame==1, over(senstec) p1(cheat_p1) p0(cheat_p0)
Number of obs = 3,065

```

		Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
TPR	DQ	.0983607	.0322171	3.05	0.002	.0352164	.161505
	CM	.283634	.0551521	5.14	0.000	.1755378	.3917302
	UQ	.1480406	.0470357	3.15	0.002	.0558524	.2402288
	FR	.0893349	.0504695	1.77	0.077	-.0095835	.1882534
FPR	DQ	0 (omitted)					
	CM	.1070532	.0264156	4.05	0.000	.0552796	.1588269
	UQ	-.0018059	.0194135	-0.09	0.926	-.0398555	.0362438
	FR	-.0206718	.0230592	-0.90	0.370	-.0658671	.0245234
P	DQ	.2364341	.0249668	9.47	0.000	.1875	.2853682
	CM	.266323	.0145293	18.33	0.000	.2378461	.2947999
	UQ	.2613386	.0179953	14.52	0.000	.2260684	.2966088

	FR	.2653016	.0180157	14.73	0.000	.2299915	.3006118
CCR	DQ	.7868217	.024708	31.84	0.000	.7383949	.8352485
	CM	.7306727	.0292892	24.95	0.000	.6732669	.7880785
	UQ	.7773501	.0204535	38.01	0.000	.737262	.8174382
	FR	.7583991	.021761	34.85	0.000	.7157484	.8010498

```

. est sto pred
.
. capt prog drop rrt
. program rrt, eclass
1.   syntax varlist [if] [in], over(varname) p1(varname) p0(varname)
2.   marksample touse
3.   markout `touse' `over' `p1' `p0'
4.   local claim: word 1 of `varlist'
5.   local sq: word 2 of `varlist'
6.   tempvar tmp
7.   qui gen `tmp' = (`sq' - (`p0')) / ((`p1' - (`p0')) if `touse'
8.   assert (`tmp' < .) if `touse'
9.   qui count if `touse'
10.  local N = r(N)
11.  qui levels of `over' if `touse', local(levels)
12.  local N_over: list sizeof levels
13.  local coln
14.  foreach l of local levels {
15.    local coln `coln' `: label (`over') `l''
16.  }
17.  foreach m in TPR FPR P CCR {
18.    tempname `m'
19.    mat ``m'' = J(1, `N_over', .)
20.    mat coln ``m'' = `coln'
21.    mat coleq ``m'' = `m'
22.  }
23.  local i 0
24.  foreach l of local levels {
25.    local ++i
26.    su `claim' if `touse' & `over' == `l', meanonly
27.    local pclaim = r(mean)
28.    mat `P'[1, `i'] = r(mean) - 1/6
29.    su `tmp' if `touse' & `claim' == 0 & `over' == `l', meanonly
30.    mat `FPR'[1, `i'] = r(mean)
31.    su `tmp' if `touse' & `claim' == 1 & `over' == `l', meanonly
32.    mat `TPR'[1, `i'] = (`pclaim'*r(mean) - `FPR'[1, `i']/6)/(`pclaim'-1/6)
33.    mat `CCR'[1, `i'] = min(1,max(0,`TPR'[1, `i']))*(`pclaim'-1/6) ///
>      + (1-min(1,max(0,`FPR'[1, `i'])))*(1-(`pclaim'-1/6))
34.  }
35.  tempname b
36.  mat `b' = `TPR', `FPR', `P', `CCR'
37.  eret post `b', obs(`N') esample(`touse')
38.  eret scalar N_over = `N_over'
39.  _coef_table_header
40.  eret di
41. end
. bootstrap, reps($reps) nodots: ///
>   rrt q6 cheat if dicegame==1, over(senstec) p1(cheat_p1) p0(cheat_p0)

```

Bootstrap results

Number of obs	=	3,065
Replications	=	1,000

	Observed Coef.	Bootstrap Std. Err.	z	P> z	Normal-based [95% Conf. Interval]	
TPR						
	DQ	.0983607	.0334468	2.94	0.003	.032806 .1639153
	CM	.283634	.0554837	5.11	0.000	.174888 .39238
	UQ	.1480406	.0472129	3.14	0.002	.055505 .2405761

	FR	.0893349	.0531078	1.68	0.093	-.0147545	.1934243
FPR	DQ	0 (omitted)					
	CM	.1070532	.0265468	4.03	0.000	.0550226	.1590839
	UQ	-.0018059	.0197516	-0.09	0.927	-.0405183	.0369065
	FR	-.0206718	.022422	-0.92	0.357	-.0646181	.0232745
P	DQ	.2364341	.0259162	9.12	0.000	.1856393	.2872289
	CM	.266323	.0141939	18.76	0.000	.2385035	.2941425
	UQ	.2613386	.0177502	14.72	0.000	.2265488	.2961284
	FR	.2653016	.0183111	14.49	0.000	.2294125	.3011908
CCR	DQ	.7868217	.0257888	30.51	0.000	.7362765	.8373669
	CM	.7306727	.0300559	24.31	0.000	.6717643	.7895812
	UQ	.7773501	.0232287	33.47	0.000	.7318228	.8228774
	FR	.7583991	.0232575	32.61	0.000	.7128151	.803983

```
. est sto predbs
```

2.4.2 Roll-a-six game

```
. capt prog drop rrt
. program rrt, eclass
1. syntax varlist [if] [in] [aw fw iw pw], over(varname) p1(varname) p0(varname) [ * ]
2. marksample touse
3. markout `touse' `over' `p1' `p0'
4. local roll: word 1 of `varlist'
5. local claim: word 2 of `varlist'
6. local sq: word 3 of `varlist'
7. tempvar tmp1 tmp2
8. qui gen byte `tmp1' = (`roll'!=6) & (`claim'==1) if `touse'
9. qui gen `tmp2' = (`sq' - (`p0')) / ((`p1' - (`p0')) if `touse'
10. assert (`tmp1'<. & `tmp2'<.) if `touse'
11. qui count if `touse'
12. local N = r(N)
13. tempname TPR vTPR FPR vFPR P vP DPR vDPR CCR vCCR
14. qui mean `tmp2' if `touse' & `tmp1'==1 [`weight'`exp'], over(`over') `options'
15. mat `TPR' = e(b)
16. mat coleq `TPR' = "TPR"
17. mat `vTPR' = e(V)
18. mat coleq `vTPR' = "TPR"
19. mat roweq `vTPR' = "TPR"
20. qui mean `tmp2' if `touse' & `tmp1'==0 [`weight'`exp'], over(`over') `options'
21. mat `FPR' = e(b)
22. mat coleq `FPR' = "FPR"
23. mat `vFPR' = e(V)
24. mat coleq `vFPR' = "FPR"
25. mat roweq `vFPR' = "FPR"
26. qui mean `tmp1' if `touse' [`weight'`exp'], over(`over') `options'
27. mat `P' = e(b)
28. mat coleq `P' = "P"
29. mat `vP' = e(V)
30. mat coleq `vP' = "P"
31. mat roweq `vP' = "P"
32. local N_over = colsof(`P')
33. tempname b V
34. mat `b' = `TPR', `FPR', `P'
35. mat `V' = (`vTPR', `vFPR'*0, `vP'*0) ///
> \ (`vFPR'*0, `vFPR', `vFPR'*0) ///
> \ (`vP'*0, `vP'*0, `vP')
36. eret post `b' `V'
37. local levels: coln `P'
```

```

38. local expCCR
39. foreach l of local levels {
40.     local expCCR `expCCR' ///
>     (`l': [TPR]_b[`l']*[P]_b[`l'] + (1 - max(0, [FPR]_b[`l']))*(1-[P]_b[`l']))
41. }
42. qui nlcom `expCCR'
43. mat `CCR' = r(b)
44. mat coleq `CCR' = "CCR"
45. mat `vCCR' = r(V)
46. mat coleq `vCCR' = "CCR"
47. mat roweq `vCCR' = "CCR"
48. mat `b' = `TPR', `FPR', `P', `CCR'
49. mat `V' = (`vTPR', `vFPR'*0, `vP'*0, `vCCR'*0) ///
>     \ (`vFPR'*0, `vFPR', `vFPR'*0, `vFPR'*0) ///
>     \ (`vP'*0, `vP'*0, `vP', `vP'*0) ///
>     \ (`vCCR'*0, `vCCR'*0, `vCCR'*0, `vCCR')
50. eret post `b' `V', obs(`N') esample(`touse')
51. eret scalar N_over = `N_over'
52. eret local cmd "rrt"
53. _coef_table_header
54. eret di
55. end

```

```

. rrt q6_roll1 q6 cheat if dicegame==2, over(senstec) p1(cheat_p1) p0(cheat_p0)

```

Number of obs = 3,070

		Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
TPR	DQ	.7058824	.1139113	6.20	0.000	.4826204	.9291443
	CM	.5292724	.0945779	5.60	0.000	.3439032	.7146417
	UQ	.5477228	.1039083	5.27	0.000	.3440664	.7513793
	FR	.4111111	.1066186	3.86	0.000	.2021425	.6200797
FPR	DQ	.0082418	.0047453	1.74	0.082	-.0010588	.0175423
	CM	.1185791	.0208271	5.69	0.000	.0777588	.1593993
	UQ	.0261191	.0160437	1.63	0.104	-.0053259	.0575641
	FR	-.0429813	.0168567	-2.55	0.011	-.0760198	-.0099427
P	DQ	.0446194	.0105915	4.21	0.000	.0238604	.0653784
	CM	.0604203	.0070537	8.57	0.000	.0465954	.0742453
	UQ	.0501285	.0078282	6.40	0.000	.0347855	.0654716
	FR	.0520156	.0080128	6.49	0.000	.0363107	.0677205
CCR	DQ	.9790026	.0074535	131.35	0.000	.9643941	.9936112
	CM	.860144	.0205367	41.88	0.000	.8198927	.9003953
	UQ	.9525182	.0164469	57.91	0.000	.9202829	.9847536
	FR	.9693686	.0072816	133.13	0.000	.9550969	.9836403

```

. est sto roll6

```

```

. capt prog drop rrt

```

```

. program rrt, eclass
1. syntax varlist [if] [in], over(varname) p1(varname) p0(varname)
2. marksample touse
3. markout `touse' `over' `p1' `p0'
4. local roll: word 1 of `varlist'
5. local claim: word 2 of `varlist'
6. local sq: word 3 of `varlist'
7. tempvar tmp1 tmp2
8. qui gen byte `tmp1' = (`roll'!=6) & (`claim'==1) if `touse'
9. qui gen `tmp2' = (`sq' - (`p0')) / ((`p1') - (`p0')) if `touse'
10. assert (`tmp1'<. & `tmp2'<.) if `touse'
11. qui count if `touse'
12. local N = r(N)

```



```

(saving pred)
(saving predbs)
(saving roll6)
(saving roll6bs)
(file individual-validation.sters saved)
. estimates clear

```

3 Graphs and Tables

3.1 Comparative validation

```

. clear all
. set scheme s1mono
. estread using comparative-validation

```

name	command	depvar	npar	title
shoplift	mean	Mean	4	
dshoplift	nlcom	Mean	3	
taxeva	mean	Mean	4	
dtaxeva	nlcom	Mean	3	
nonvote	mean	Mean	4	
dnonvote	nlcom	Mean	3	
predict	mean	Mean	4	
dpredict	nlcom	Mean	3	
roll6	mean	Mean	4	
droll6	nlcom	Mean	3	

```

.
. esttab shoplift taxeva nonvote predict roll6 using _tables.rtf, replace ///
> title(Comparative validation) onecell nogap ///
> nostar mti nonumb eqlab(none) compress transform(@*100 100) b(2) se(2)
(output written to _tables.rtf)
. esttab dshoplift dtaxeva dnonvote dpredict droll6 using _tables.rtf, append ///
> onecell nogap varlab(CM "CM-DQ" UQ "UQ-DQ" FR "FR-DQ") ///
> nostar mti nonumb eqlab(none) compress transform(@*100 100) b(2) se(2)
(output written to _tables.rtf)
.
. local list shoplift \ taxeva \ nonvote \ predict \ roll6
. local dlist dshoplift, aseq(shoplift) \ ///
> dtaxeva , aseq(taxeva) \ ///
> dnonvote , aseq(nonvote) \ ///
> dpredict , aseq(predict) \ ///
> droll6 , aseq(roll6) \
. coefplot (`list', keep(DQ) label(DQ)) ///
> (`list', keep(CM) label(CM)) ///
> (`list', keep(UQ) label(UQ)) ///
> (`list', keep(FR) label(FR)) ///
> , aseq bylabel("Prevalence estimate in %") ///
> || (`dlist', keep(DQ)) ///
> (`dlist', keep(CM)) ///
> (`dlist', keep(UQ)) ///
> (`dlist', keep(FR)) ///
> , bylabel("Difference to DQ") ///
> || , rescale(100) swap xline(0) xlab(#10, grid) yscale(alt noline) ///
> mfc(white) mlc(black) ciopts(lc(black)) subtitle(, fc(none)) ///
> coeflabels(shoplift = "Shoplifting" ///
> taxeva = "Tax evasion" ///
> nonvote = "Non-voting" ///
> predict = `"'Cheating in the" "prediction game"'` ///
> roll6 = `"'Cheating in the" "roll-a-six game"'` ///

```

```

> , tlc(none)) //
> byopts(legend(off) xrescale graphr(margin(zero))) legend(pos(0))
(dshoplift: no coefficients found, all dropped, or none kept)
(dtaxeva: no coefficients found, all dropped, or none kept)
(dnonvote: no coefficients found, all dropped, or none kept)
(dpredict: no coefficients found, all dropped, or none kept)
(droll6: no coefficients found, all dropped, or none kept)
. gr_edit .plotregion1.move yaxis1[2] leftof 8 6
. addplot 1: , legend(order(2 "DQ" 4 "CM" 6 "UQ" 8 "FR") on bplace(se) cols(1)) norescaling
. qui graph export comparative-validation.pdf, replace

```

3.2 Aggregate-level validation

```

. est clear
. estread using aggregate-validation

```

name	command	depvar	npar	title
pred	mean	Mean	12	
roll6	mean	Mean	12	

```

.
. esttab pred using _tables.rtf, append unstack //
> title(Aggregate-level validation: prediction game) onecell nogap //
> nostar mti nonumb compress transform(@*100 100) b(2) se(2)
(output written to _tables.rtf)
. esttab roll6 using _tables.rtf, append unstack //
> title(Aggregate-level validation: roll-a-six game) onecell nogap //
> nostar mti nonumb compress transform(@*100 100) b(2) se(2)
(output written to _tables.rtf)
.
. coefplot (pred, keep(cheated:) \ roll6, keep(cheated:)) //
> (pred, keep(estimate:) \ roll6, keep(estimate:)) //
> , bylabel("Cheating prevalence in %") //
> || (pred, keep(difference:) \ roll6, keep(difference:)) //
> , bylabel("Bias") //
> || , aseq norecycle rescale(100) xline(0) xlab(#10, grid) //
> mfc(white) mlc(black) ciopts(lc(black)) subtitle(, fc(none)) //
> eqlab("Prediction game" "Roll-a-six game") //
> byopts(legend(off) xrescale graphr(margin(zero))) legend(pos(0))
. addplot 1: , legend(order(2 "true rate" 4 "survey estimate") on bplace(se) cols(1)) norescaling
. qui graph export aggregate-validation.pdf, replace

```

3.3 Individual-level aggregation

```

. est clear
. estread using individual-validation

```

name	command	depvar	npar	title
pred	rvt	no depvar	16	
predbs	bootstrap	no depvar	16	
roll6	rvt	no depvar	16	
roll6bs	bootstrap	no depvar	16	

```

.
. esttab pred using _tables.rtf, append unstack drop(P:) //
> title(Individual-level validation: prediction game) onecell nogap //

```

```

>   nostar mti nonumb compress transform(@*100 100) b(2) se(2)
(output written to _tables.rtf)
.   esttab roll6 using _tables.rtf, append unstack drop(P:) ///
>   title(Individual-level validation: roll-a-six game) onecell nogap ///
>   nostar mti nonumb compress transform(@*100 100) b(2) se(2)
(output written to _tables.rtf)
.
.   coefplot (pred, keep(TPR:)) || (roll6, keep(TPR:)) ///
>   || (pred, keep(FPR:)) || (roll6, keep(FPR:)) ///
>   || (pred, keep(CCR:)) || (roll6, keep(CCR:)) ///
>   || , bylabels("True positive rate" "True positive rate" ///
>   "False positive rate" "False positive rate" ///
>   "Correct classification rate" "Correct classification rate") xlab(#10, grid) ///
>   rescale(100) mfc(white) mlc(black) ciopts(lc(black)) ///
>   subtitle(, fc(none)) byopts(xrescale cols(2) graphr(margin(zero)) scale(0.75)) ysize(5)
.   addplot 3 4: , xline(0) norescaling
.   addplot 1: , title(Prediction game) norescaling
.   addplot 2: , title(Roll-a-six game) norescaling
.   qui graph export individual-validation.pdf, replace

```