Participating in the Fragile Families Challenge Activity

Matthew Salganik, Ian Lundberg, Alex Kindel, Sara McLanahan,
and people from around the world

Summer Institutes in Computational Social Science
June 21, 2019

Fragile Families Challenge is supported by the Russell Sage Foundation. Board of Advisors: Jeanne Brooks-Gunn, Kathryn Edin, Barbara Engelhardt, Irwin Garfinkel, Moritz Hardt, Dean Knox, Nicholas Lemann, Karen Levy, Sara McLanahan, Arvind Narayanan, Timothy Nelson, Matthew Salganik, Brandon Stewart & Duncan Watts.


12,942 features
birth to age 9
6 outcomes
age 15
4,242 families
Training
Leaderboard
Holdout

Introducing the outcome variables

GPA[1]

[1] Learn more at http://www.fragilefamilieschallenge.org/gpa/

GPA[1]

How do kids beat the odds academically?

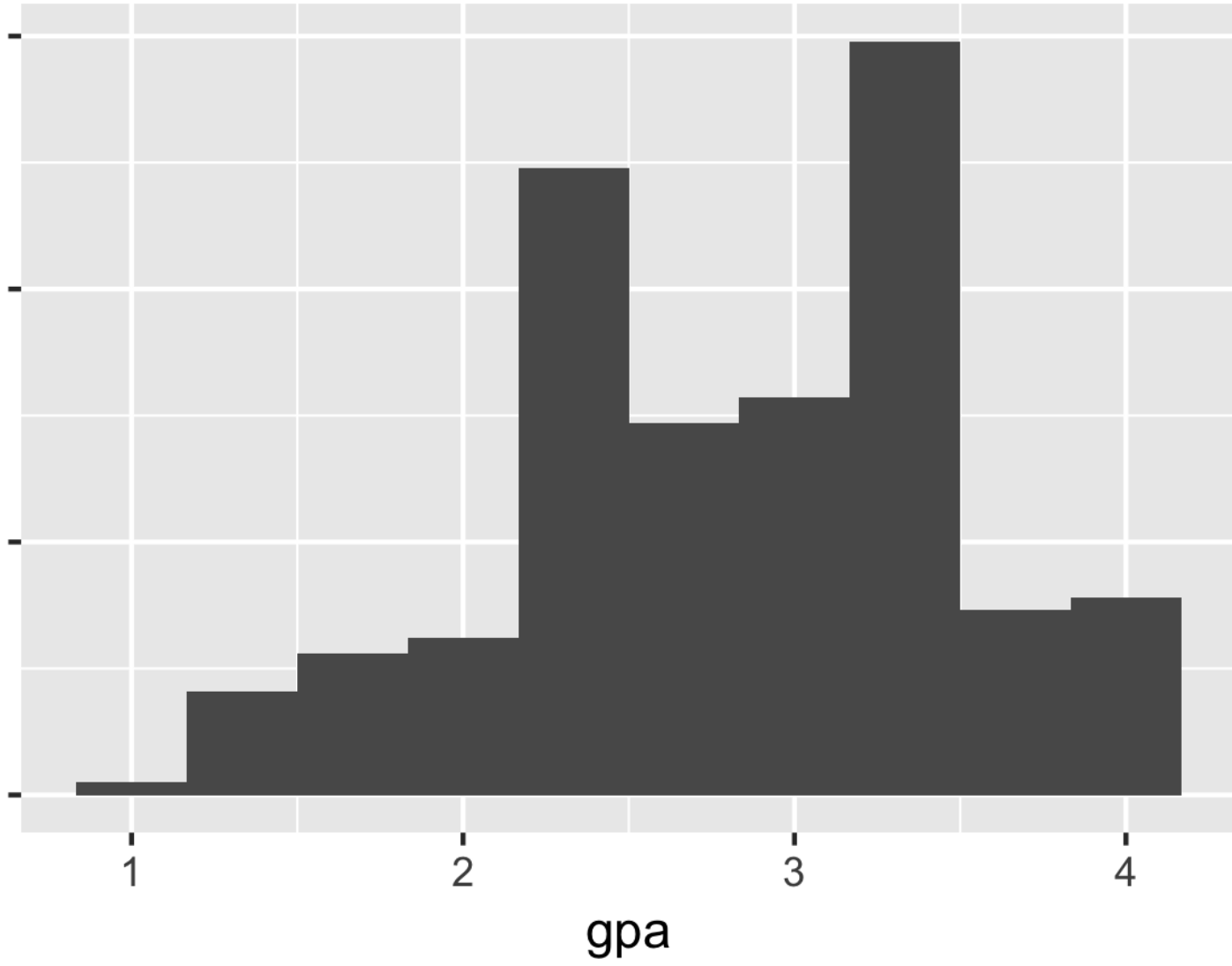
[1] Learn more at `http://www.fragilefamilieschallenge.org/gpa/`

GPA[2]

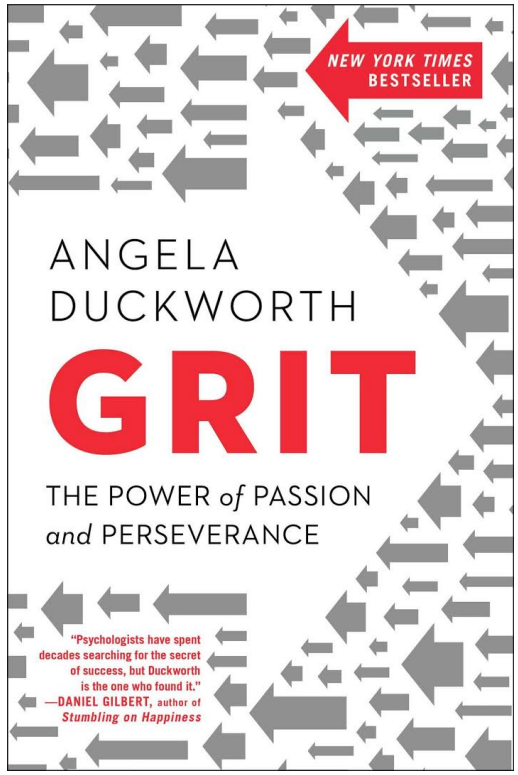
B20. At the {most recent grading period/last grading period in the spring} what was your grade in …

		A	B	C	D OR LOWER	NO GRADE OR PASS/FAIL	REF	DK	N/A HOMESCHOOLED
B20A	English or language arts? ..	1	2	3	4	5	-1	-2	7 → **GO TO B22A**
B20B	Math?	1	2	3	4	5	-1	-2	7 → **GO TO B22A**
B20C	History or social studies? ..	1	2	3	4	5	-1	-2	7 → **GO TO B22A**
B20D	Science?	1	2	3	4	5	-1	-2	7 → **GO TO B22A**

[2]This variable is reverse-coded in the data file so that higher values represent higher GPAs.

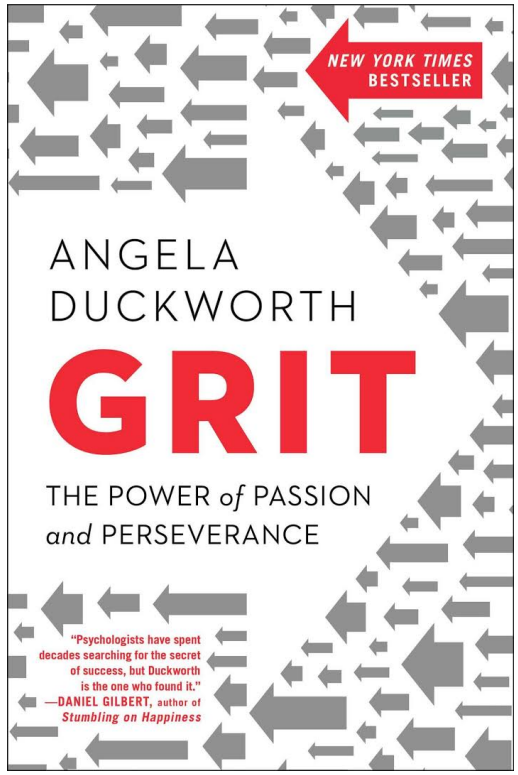

1
2
3
4
gpa

"Grit" predicts success, possibly more than IQ.[3]



[3]Learn more at `http://www.fragilefamilieschallenge.org/grit/`

"Grit" predicts success, possibly more than IQ.[3]



What makes some kids gritty?

[3]Learn more at `http://www.fragilefamilieschallenge.org/grit/`

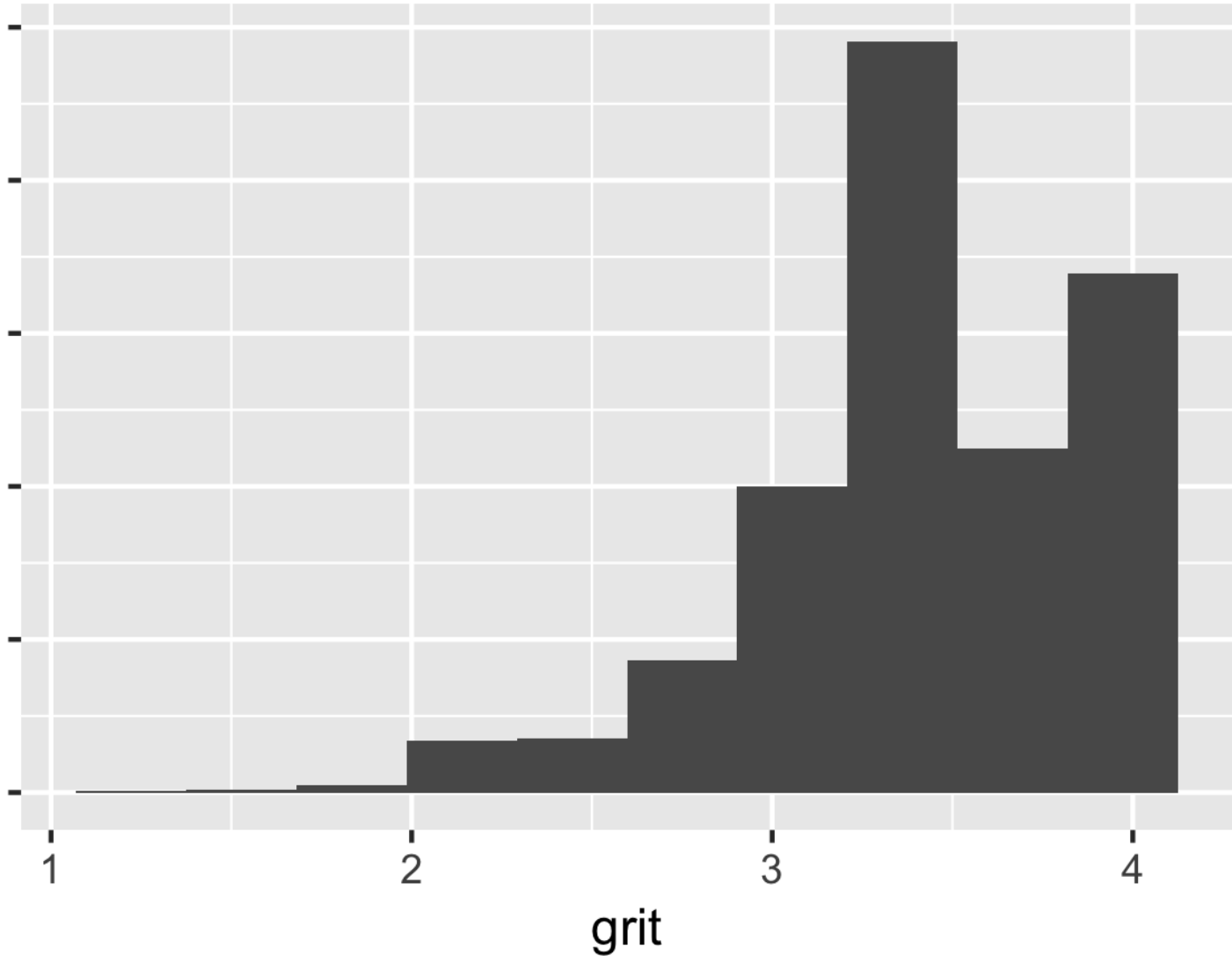
Grit[4]

D2. Thinking about how you have behaved or felt during the past four weeks, please tell me whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with the following statements.

PROBE: Thinking about the past four weeks, do you strongly agree, somewhat agree, somewhat disagree, or strongly disagree with this statement?

		STRONGLY AGREE	SOMEWHAT AGREE	SOMEWHAT DISAGREE	STRONGLY DISAGREE	REF	DK
D2I.	I keep at my schoolwork until I am done with it.....	1	2	3	4	-1	-2
D2K.	Once I make a plan to get something done, I stick to it.....	1	2	3	4	-1	-2
D2M.	I finish whatever I begin.....	1	2	3	4	-1	-2
D2V.	I am a hard worker	1	2	3	4	-1	-2

[4]This variable is reverse-coded in the data file so that higher values represent more grit.


1
2
3
4
grit

Material hardship[5]

[5] Learn more at
http://www.fragilefamilieschallenge.org/material-hardship/

Material hardship[5]

What unmeasured predictors are associated with families unexpectedly escaping severe deprivation?

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http://www.fragilefamilieschallenge.org/material-hardship/

Material hardship[5]

What unmeasured predictors are associated with families unexpectedly escaping severe deprivation?

What sends families unexpectedly into deep poverty?

[5] Learn more at
http://www.fragilefamilieschallenge.org/material-hardship/

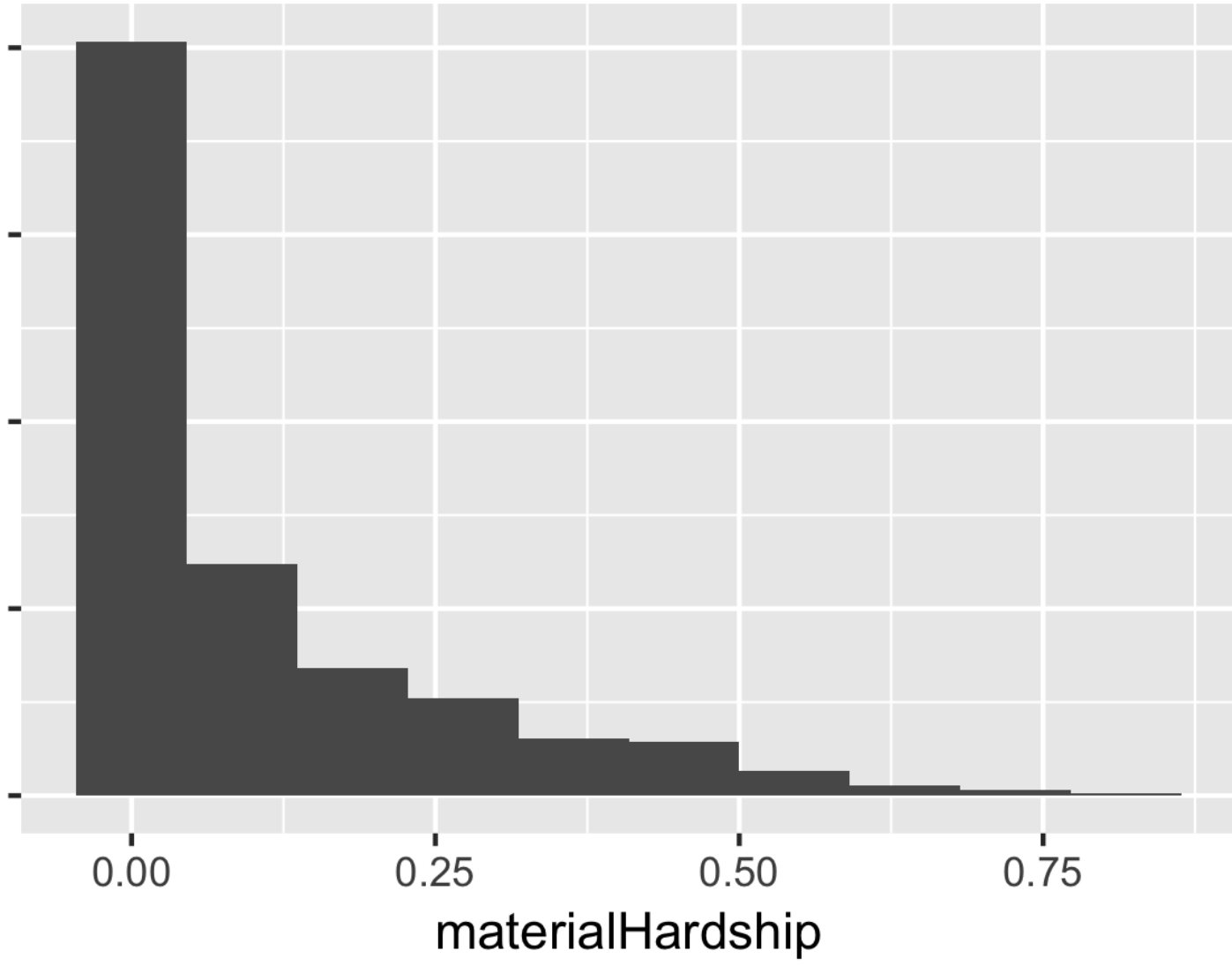
Material hardship

We are also interested in some of the problems that families face making ends meet. In the past twelve months, did you do any of the following because there wasn't enough money?

		YES	NO	REF	DK
J37.	In the past twelve months, did you receive free food or meals?	1	2	-1	-2
J38.	In the past twelve months, were you ever hungry, but didn't eat because you couldn't afford enough food?	1	2	-1	-2
J39.	In the past twelve months, did you ever not pay the full amount of rent or mortgage payments?	1	2	-1	-2
J40.	In the past twelve months, were you evicted from your home or apartment for not paying the rent or mortgage?	1	2	-1	-2
J41.	In the past twelve months, did you not pay the full amount of gas, oil, or electricity bill?	1	2	-1	-2
J42.	In the past twelve months, was your gas or electric services ever turned off, or the heating oil company did not deliver oil, because there wasn't enough money to pay the bills?	1	2	-1	-2
J43.	In the past twelve months, did you borrow money from friends or family to help pay bills?	1	2	-1	-2
J44.	In the past twelve months, did you move in with other people even for a little while because of financial problems?	1	2	-1	-2

Material hardship

J45.	In the past twelve months, did you stay at a shelter, in an abandoned building, an automobile or any other place not meant for regular housing, even for one night?	1	2	-1	-2
J46.	In the past twelve months, was there anyone in your household who needed to see a doctor or go to the hospital but couldn't go because of the cost?	1	2	-1	-2
J47.	In the past twelve months, was your telephone service (mobile or land line) cancelled or disconnected by the telephone company because there wasn't enough money to pay the bill?	1	2	-1	-2


0.00
0.25
0.50
0.75
materialHardship

Eviction[6]

[6] Learn more at `http://www.fragilefamilieschallenge.org/eviction/`

[7] Note: You will just create propensity scores for eviction given background variables; causal inference comes in the second stage of the Challenge when outcomes are measured several years from now.

Eviction[6]

Does housing eviction **cause** worse outcomes as kids transition to adulthood?[7]

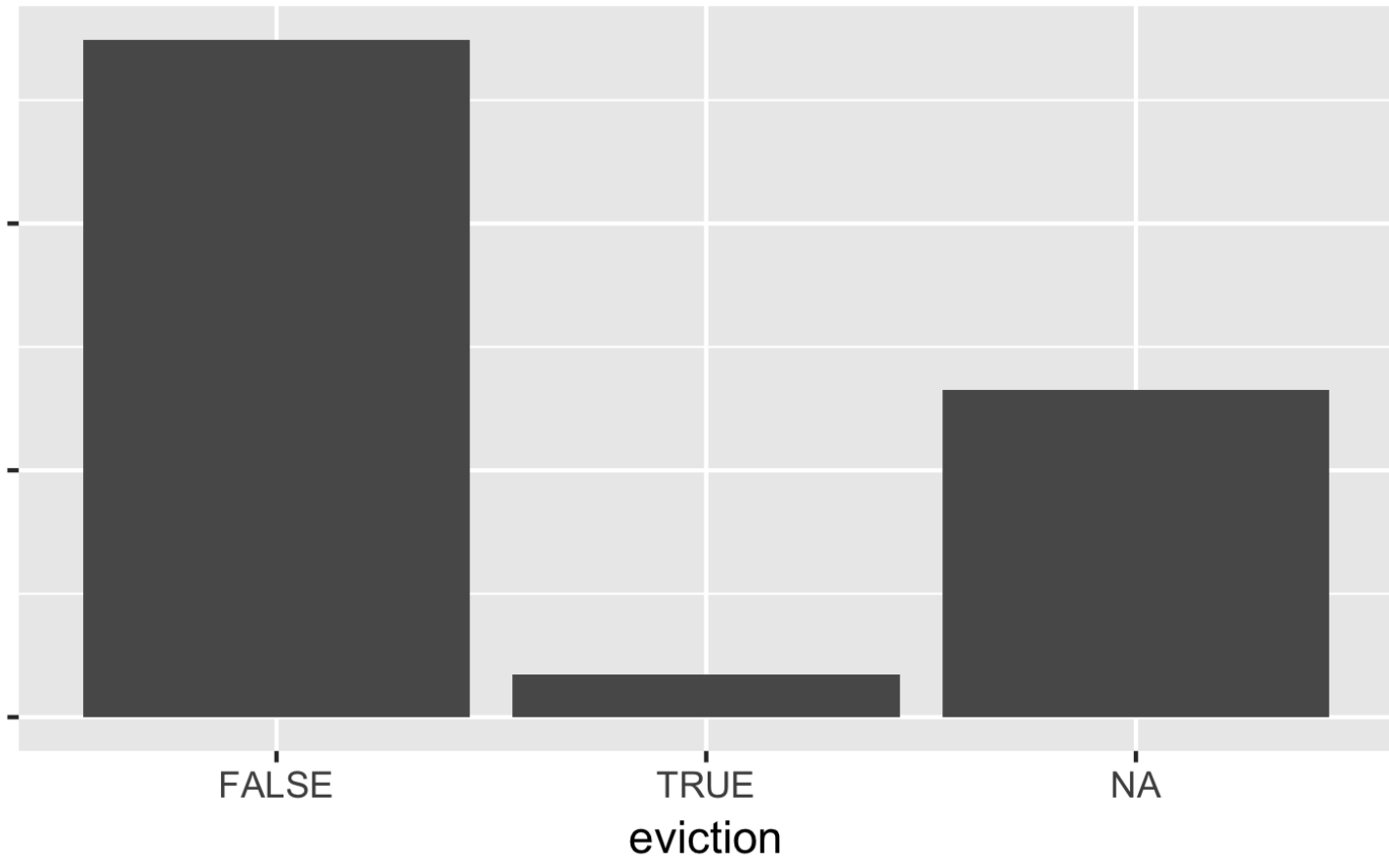
[6] Learn more at `http://www.fragilefamilieschallenge.org/eviction/`

[7] Note: You will just create propensity scores for eviction given background variables; causal inference comes in the second stage of the Challenge when outcomes are measured several years from now.

Eviction

J51. Since {MONTH AND YEAR COHORT CITY FIELDED IN YR 9}, were you evicted from your home or apartment for not paying the rent or mortgage?

YES.....1
NO.....2
REFUSED.....-1
DON'T KNOW.....-2


FALSE
TRUE
NA
eviction

Caregiver layoff[8]

[8] Learn more at `http://www.fragilefamilieschallenge.org/layoff/`

[9] Note: You will just create propensity scores for caregiver layoff given background variables; causal inference comes in the second stage of the Challenge when outcomes are measured several years from now.

Caregiver layoff[8]

Does layoff of a caregiver **cause** collateral damage for kids?[9]

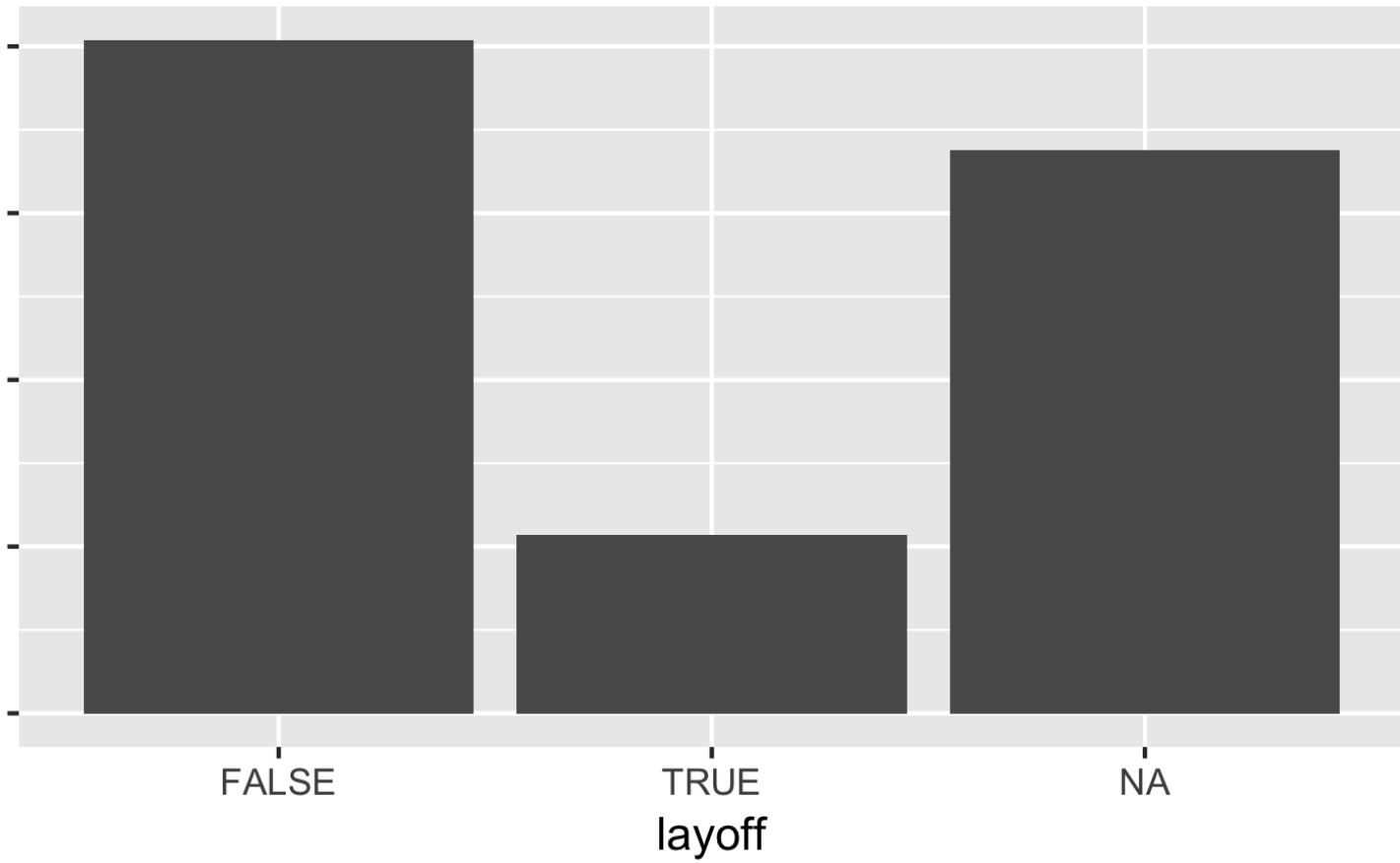
[8] Learn more at `http://www.fragilefamilieschallenge.org/layoff/`

[9] Note: You will just create propensity scores for caregiver layoff given background variables; causal inference comes in the second stage of the Challenge when outcomes are measured several years from now.

Caregiver layoff

K13. Since {MONTH AND YEAR COHORT CITY FIELDED IN YR 9}, have you been laid off from your employer for any time?

YES.....1
NO.....2
REFUSED.....-1
DON'T KNOW.....-2


FALSE
TRUE
NA
layoff

Job training[10]

[10] Learn more at
http://www.fragilefamilieschallenge.org/job-training/

[11] Note: You will just create propensity scores for job training given background variables; causal inference comes in the second stage of the Challenge when outcomes are measured several years from now.

Job training[10]

Does job training for a caregiver **cause** collateral benefits for children?[11]

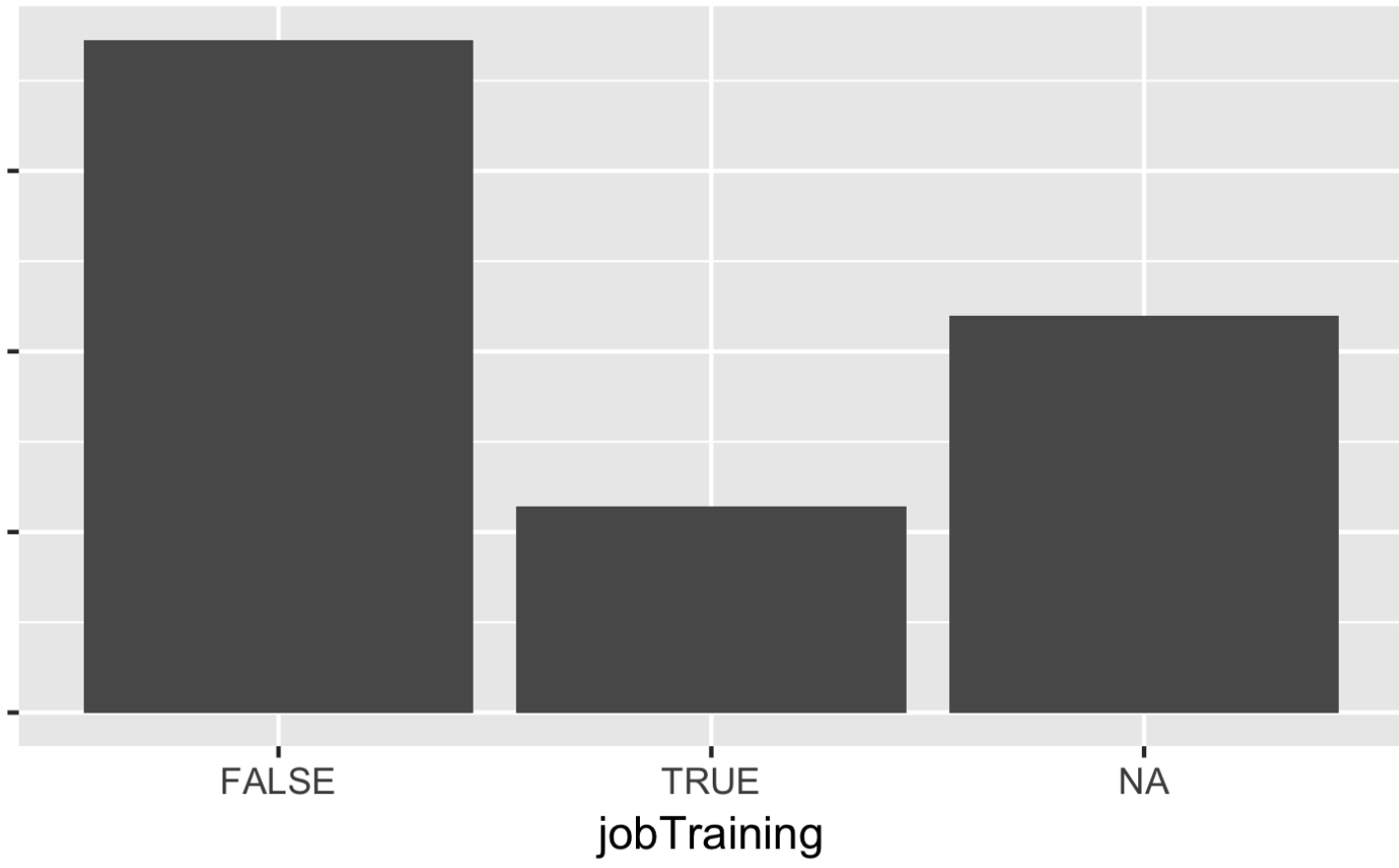
[10] Learn more at
`http://www.fragilefamilieschallenge.org/job-training/`

[11] Note: You will just create propensity scores for job training given background variables; causal inference comes in the second stage of the Challenge when outcomes are measured several years from now.

Caregiver job training

K4. Since {MONTH AND YEAR COHORT CITY FIELDED IN YR 9}, have you taken any classes to improve your job skills, such as computer training or literacy classes?

YES.....1
NO.....2
REFUSED.....-1
DON'T KNOW.....-2


FALSE
TRUE
NA
jobTraining

Introducing the data

The Fragile Families and Child Wellbeing Study is a dataset of real people who have selflessly opened up their lives to us for the last 15 years so that their experiences can contribute to scientific research. By participating in the Fragile Families Challenge, you become a collaborator in this project. It is of the utmost importance that you respect the families in the data by using what they have told us responsibly.

- Before you have access to the data, you will complete a data use agreement

- Before you have access to the data, you will complete a data use agreement
- After this activity you will delete the data from your computer

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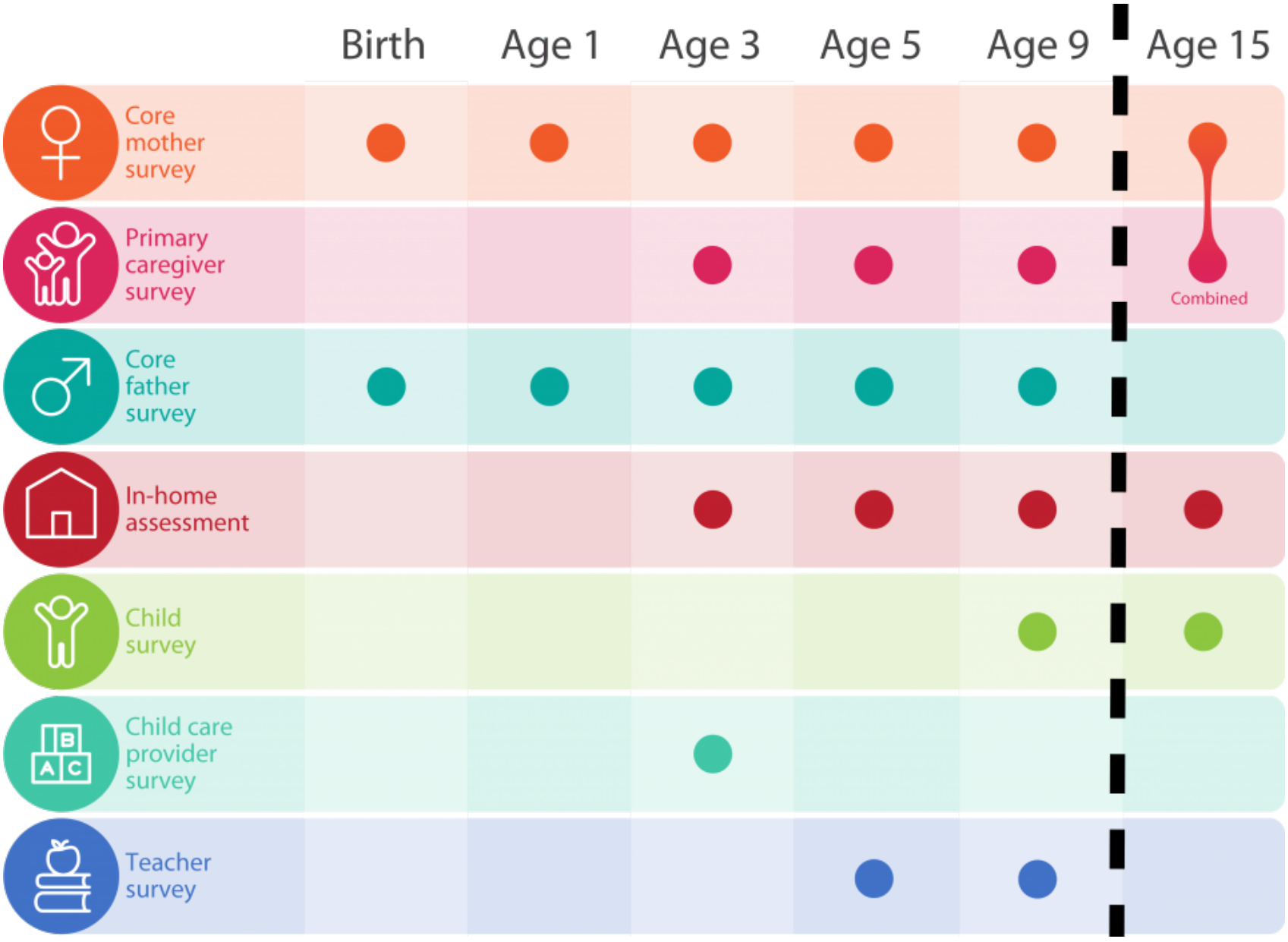
- After this activity you will delete the data from your computer
- If you want to keep working with the data afterwards, you can apply for access through the Fragile Families website


Birth
Age 1
Age 3
Age 5
Age 9
Age 15
Core mother survey
Primary caregiver survey
Combined
Core father survey
In-home assessment
Child survey
Child care provider survey
Teacher survey

RStudio Source Editor

f5f

Filter

	f5f1	f5f1a	f5f2	f5f3	f5f3a	f5f3b	f5f3b1	f5f4	f5f4a	f5f4b	f5f5	f5f6	f5f7a	f5f7b	f5f7c	f5f8a1	f5f8b1	f5f8c1	f5f8a2	f5f8b2	f5f8c2	f5f8a3
1	-9	-9	-9	-9.00	-9.00	-9.000000	-3	-9.00000	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	
2	-9	-9	-9	-9.00	-9.00	-9.000000	-3	-9.00000	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	
3	-9	-9	-9	-9.00	-9.00	-9.000000	-3	-9.00000	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	
4	-6	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	
5	-6	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	
6	2	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	2	2	2	2	-6	-6	1	12	600	
7	-6	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	
8	1	3	2	-6.00	-6.00	-6.000000	-3	196.26903	1	2	2	2	2	2	2	2	-6	-6	2	-6	-6	
9	-6	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	
10	1	1	1	-6.00	-6.00	-6.000000	-3	1310.50458	-10	2	2	2	2	2	2	2	-6	-6	2	-6	-6	
11	1	5	4	149734....	11087.07	1.271596	-3	-6.00000	-6	-6	-6	-6	1	2	2	2	-6	-6	2	-6	-6	
12	-9	-9	-9	-9.00	-9.00	-9.000000	-3	-9.00000	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	
13	1	2	1	-6.00	-6.00	-6.000000	-3	1024.43600	3	2	2	2	2	2	2	2	-6	-6	2	-6	-6	
14	-6	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	
15	1	5	3	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	2	-6	2	2	2	2	-6	-6	2	-6	-6	
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17	-6	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	
18	1	3	1	-6.00	-6.00	-6.000000	-3	877.82490	1	2	2	2	1	1	2	1	3	176	2	-6	-6	
19	-9	-9	-9	-9.00	-9.00	-9.000000	-3	-9.00000	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	
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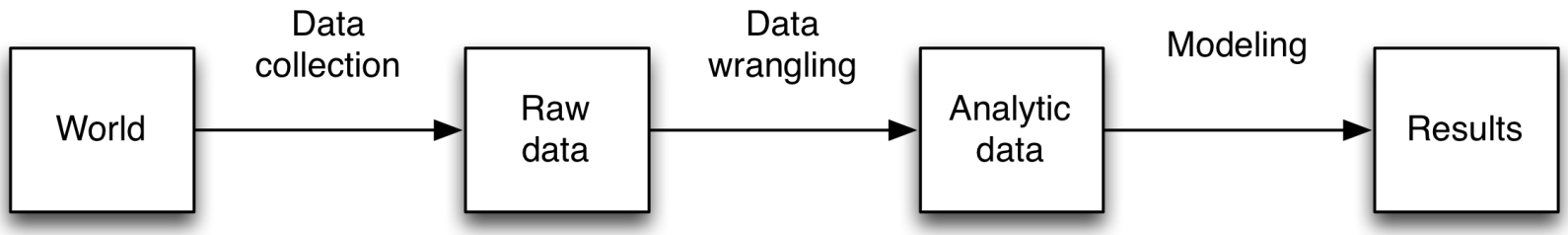
21	-9	-9	-9	-9.00	-9.00	-9.000000	-3	-9.00000	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	
22	1	1	1	-6.00	-6.00	-6.000000	-3	720.26305	1	2	2	2	1	2	2	2	-6	-6	2	-6	-6	

Showing 1 to 24 of 4,242 entries


World
Data collection
Raw data
Data wrangling
Analytic data
Modeling
Results

- A team of people[12] has spent months making the data easier to use.

[12] Alexander Kindel, Vineet Bansal, Kristin Catena, Thomas Hartshorne, Kate Jaeger, Dawn Koffman, Sara McLanahan, Maya Phillips, Shiva Rouhani, Ryan Vinh, Matthew Salganik.

- A team of people[12] has spent months making the data easier to use.
- Is it possible to do better than last time? Or, is there a fundamental limit with this data and this task?

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- Let's see if it improves performance,

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- A team of people[12] has spent months making the data easier to use.
- Is it possible to do better than last time? Or, is there a fundamental limit with this data and this task?
- Let's see if it improves performance, and let's see if you can help make this easier for future researchers.

[12] Alexander Kindel, Vineet Bansal, Kristin Catena, Thomas Hartshorne, Kate Jaeger, Dawn Koffman, Sara McLanahan, Maya Phillips, Shiva Rouhani, Ryan Vinh, Matthew Salganik.

How do I know what these variables are?

`http://metadata.fragilefamilies.princeton.edu/variables`

Introducing `cm1relf`

`metadata.fragilefamilies.princeton.edu/variables/cm1relf`

You can filter variables by:

- Topic
- Wave
- Respondent
- Variable Type (e.g., continuous, ordered categorical, unordered categorical, etc).

Why `cm1relf`?

Why `cm1relf`?

Response type	Respondent	Wave	Leaf
(blank): questionnaire c: constructed	m - mother f - father p - primary caregiver k - child t - teacher h - home o - observations n - non parental caregiver d - child care center r - family care center u - post center observations q - couple	1 - baseline 2 - year 1 3 - year 3 4 - year 5 5 - year 9 6 - year 15	(letter): survey section + (number): question number OR (string): Constructed variable ID OR (string): national or city weight

Want direct access to the metadata?

Want direct access to the metadata? No problem

- API: `api.metadata.fragilefamilies.princeton.edu`
- Python package: `github.com/fragilefamilieschallenge/ffmetadata-py`
- R package: `github.com/fragilefamilieschallenge/ffmetadata`
- Raw metadata: `api.fragilefamiliesmetadata.org/get_metadata`


PRINCETON UNIVERSITY
Fragile Families
& Child Wellbeing Study
PRINCETON | COLUMBIA
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Spotlight on FFCWS and Incarceration Research
Recent publications using the Fragile Families & Child


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Data and Documentation
Contact
General Documentation
Baseline
Year 1
Year 3
Year 5
Year 9
Year 15
FAQ
Links to documentation for each wave
Data and Documentation
Data
Data are free to download from Princeton University's Office of Population Research (OPR) data archive.
Currently, there are five waves of publicly available data including baseline and Year 1, Year 3, Year 5, and Year 9 follow-ups. In order to protect the confidentiality of survey respondents, geographic identifiers, medical records data, contextual data (i.e., census tract characteristics), macroeconomic indicators, and genetic biomarkers are not available in the public use data files. Researchers may apply for these data via a restricted use contract.
Documentation

Year 9

The Year 9 follow-up wave of data collection took place from 2007 to 2010, which makes the data useful for researchers interested in the effects of the Great Recession on children and families. It is different from previous waves because the home visit was integral to the wave procedures. In previous waves, we conducted core interviews before proceeding to the in-home components. At year 9, our initial interview was with the child's primary caregiver (usually the mother) and we scheduled a home visit at the time of that initial interview. As part of the home visit, we interviewed focal children for the first time. We attempted teacher surveys through the mail. Similar to previous waves, we have core interviews with mothers and fathers. Restricted Data at this wave include census tract characteristics of mother and father residences, macroeconomic indicators, administrative data on children's school characteristics, and genetic data from saliva samples from the mother and focal child.

PRIMARY CAREGIVER

Primary Caregiver Survey

Primary Caregiver Self-Administered

SCALES

Scales documentation

MOTHER

Questionnaire

Codebook

FATHER

Questionnaire

Codebook

CHILD

Child Survey

Home Visit Workbook

Interviewer Observations

Codebook

TEACHER

Questionnaire

Codebook

Each survey has a questionnaire and a codebook

Questionnaire:

BOX A3A2

IF PCG=BIOFATHER IN THE PCG IDENTIFIER IN THE SCREENER, GO TO A3C.

ELSE IF PCG= NON-PARENT AND RELATIONSHIP = MATERNAL GRANDPARENT(S), PATERNAL GRANDPARENT(S), OTHER RELATIVES OR FRIEND IN THE PCG IDENTIFIER IN THE SCREENER, GO TO A3B1A.

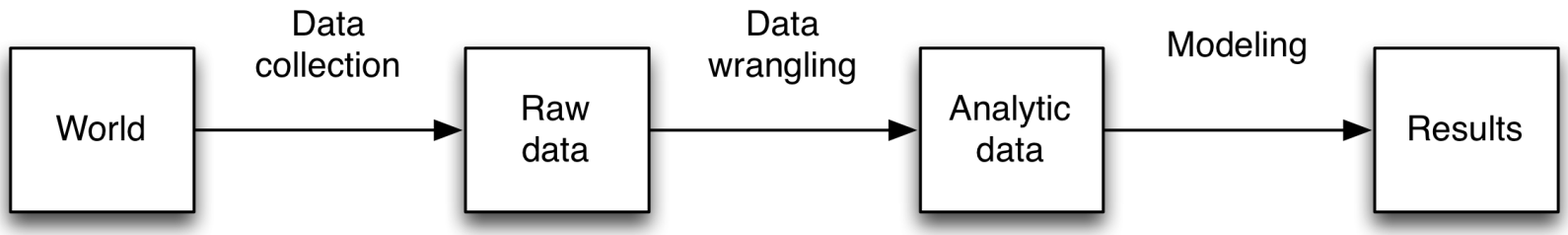
ELSE IF PCG=NON-PARENT AND RELATIONSHIP=FOSTER CARE IN THE PCG IDENTIFIER IN THE SCREENER, GO TO A3B.

ELSE IF PCG=NON-PARENT AND RELATIONSHIP = OTHER, SPECIFY IN THE PCG IDENTIFIER IN THE SCREENER, GO TO A3B1A.

ELSE IF PCG= "NOT MOTHER" IN THE PCG IDENTIFIER GO TO A3D.

A3B. Are {CHILD}'s foster parents related to you?

YES 1
NO 2
REFUSED ..... -1
DON'T KNOW ..... -2


World
Data collection
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Results

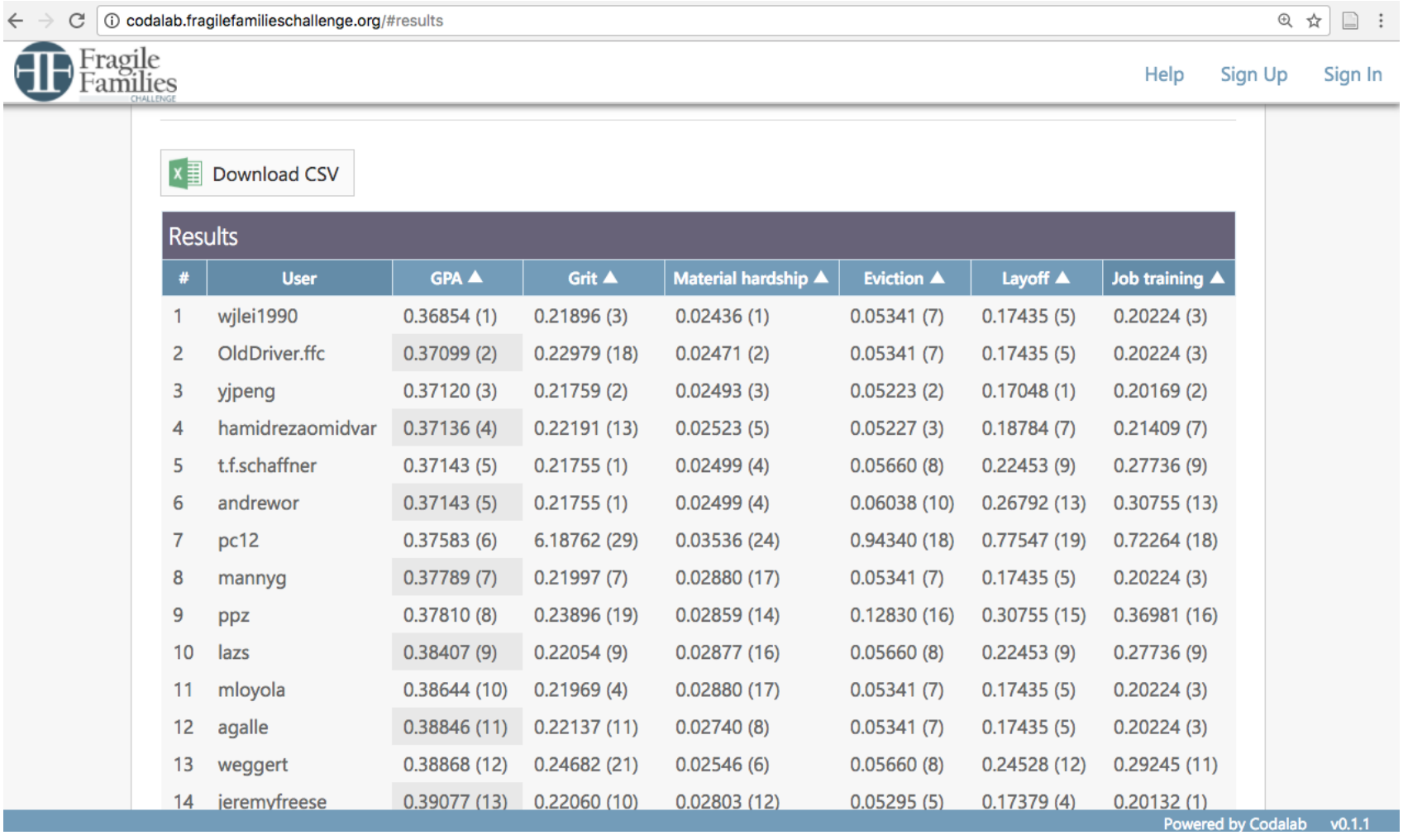
Building a submission

Submissions include:

1. Predictions
2. Code
3. Narrative explanation

Submission preparation instructions:
www.fragilefamilieschallenge.org/upload-your-contribution/

Get on the leaderboard



codalab.fragilefamilieschallenge.org/#results

Fragile Families CHALLENGE

Help Sign Up Sign In

Download CSV

Results

#	User	GPA ▲	Grit ▲	Material hardship ▲	Eviction ▲	Layoff ▲	Job training ▲
1	wjlei1990	0.36854 (1)	0.21896 (3)	0.02436 (1)	0.05341 (7)	0.17435 (5)	0.20224 (3)
2	OldDriver.ffc	0.37099 (2)	0.22979 (18)	0.02471 (2)	0.05341 (7)	0.17435 (5)	0.20224 (3)
3	yjpeng	0.37120 (3)	0.21759 (2)	0.02493 (3)	0.05223 (2)	0.17048 (1)	0.20169 (2)
4	hamidrezaomidvar	0.37136 (4)	0.22191 (13)	0.02523 (5)	0.05227 (3)	0.18784 (7)	0.21409 (7)
5	t.f.schaffner	0.37143 (5)	0.21755 (1)	0.02499 (4)	0.05660 (8)	0.22453 (9)	0.27736 (9)
6	andrewor	0.37143 (5)	0.21755 (1)	0.02499 (4)	0.06038 (10)	0.26792 (13)	0.30755 (13)
7	pc12	0.37583 (6)	6.18762 (29)	0.03536 (24)	0.94340 (18)	0.77547 (19)	0.72264 (18)
8	mannyg	0.37789 (7)	0.21997 (7)	0.02880 (17)	0.05341 (7)	0.17435 (5)	0.20224 (3)
9	ppz	0.37810 (8)	0.23896 (19)	0.02859 (14)	0.12830 (16)	0.30755 (15)	0.36981 (16)
10	lazs	0.38407 (9)	0.22054 (9)	0.02877 (16)	0.05660 (8)	0.22453 (9)	0.27736 (9)
11	mloyola	0.38644 (10)	0.21969 (4)	0.02880 (17)	0.05341 (7)	0.17435 (5)	0.20224 (3)
12	agalle	0.38846 (11)	0.22137 (11)	0.02740 (8)	0.05341 (7)	0.17435 (5)	0.20224 (3)
13	weggert	0.38868 (12)	0.24682 (21)	0.02546 (6)	0.05660 (8)	0.24528 (12)	0.29245 (11)
14	jeremyfreese	0.39077 (13)	0.22060 (10)	0.02803 (12)	0.05295 (5)	0.17379 (4)	0.20132 (1)

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Advice

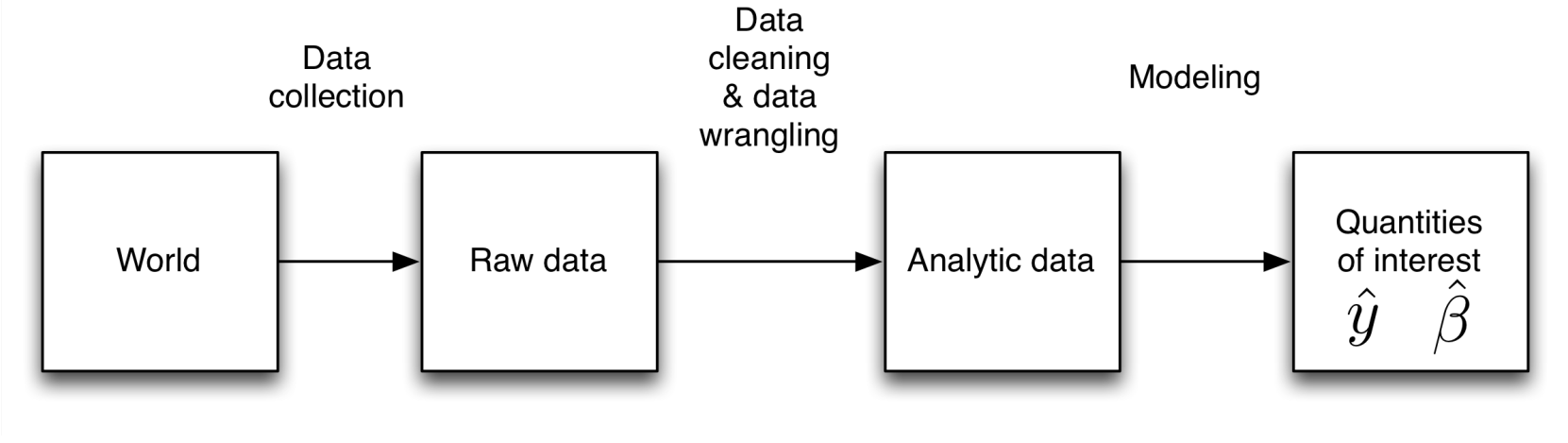
Most good approaches will likely involve

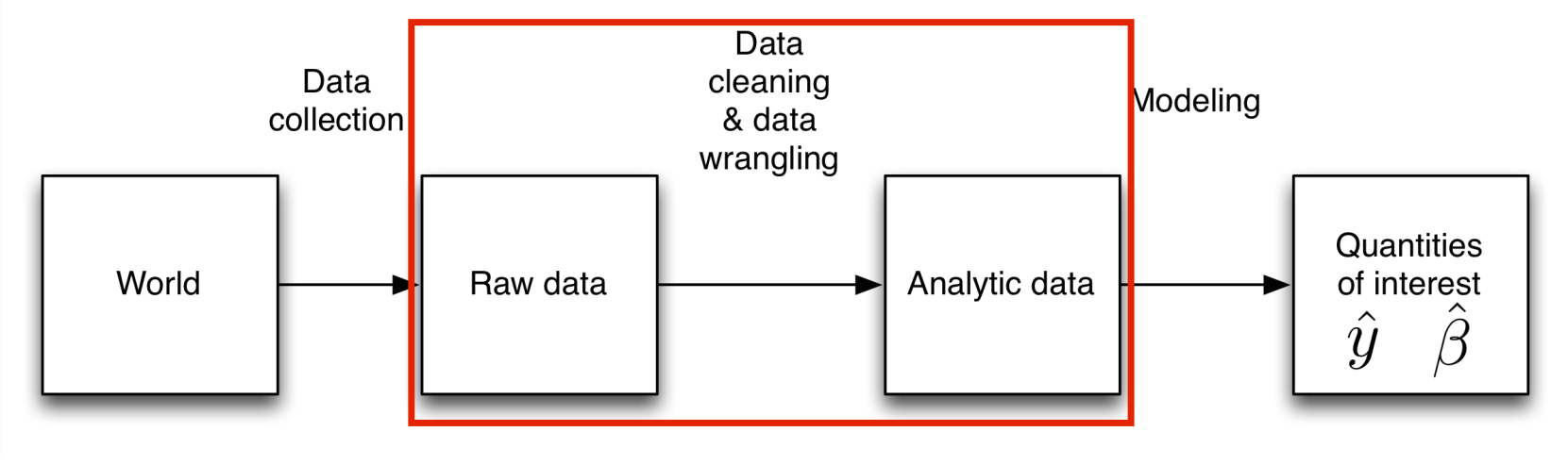
Most good approaches will likely involve

- careful data preparation

Most good approaches will likely involve

- careful data preparation
- flexible models that avoid overfitting


Data
collection
Data
cleaning
& data
wrangling
Modeling
World
Raw data
Analytic data
Quantities
of interest
$\hat{y}$ $\hat{\beta}$


Data
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RStudio Source Editor

f5f

Filter

	f5f1	f5f1a	f5f2	f5f3	f5f3a	f5f3b	f5f3b1	f5f4	f5f4a	f5f4b	f5f5	f5f6	f5f7a	f5f7b	f5f7c	f5f8a1	f5f8b1	f5f8c1	f5f8a2	f5f8b2	f5f8c2	f5f8a3
1	-9	-9	-9	-9.00	-9.00	-9.000000	-3	-9.00000	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	
2	-9	-9	-9	-9.00	-9.00	-9.000000	-3	-9.00000	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	
3	-9	-9	-9	-9.00	-9.00	-9.000000	-3	-9.00000	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	
4	-6	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	
5	-6	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	
6	2	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	2	2	2	2	-6	-6	1	12	600	
7	-6	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	
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9	-6	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	
10	1	1	1	-6.00	-6.00	-6.000000	-3	1310.50458	-10	2	2	2	2	2	2	2	-6	-6	2	-6	-6	
11	1	5	4	149734....	11087.07	1.271596	-3	-6.00000	-6	-6	-6	-6	1	2	2	2	-6	-6	2	-6	-6	
12	-9	-9	-9	-9.00	-9.00	-9.000000	-3	-9.00000	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	
13	1	2	1	-6.00	-6.00	-6.000000	-3	1024.43600	3	2	2	2	2	2	2	2	-6	-6	2	-6	-6	
14	-6	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	
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16	2	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	2	2	2	2	-6	-6	2	-6	-6	
17	-6	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	
18	1	3	1	-6.00	-6.00	-6.000000	-3	877.82490	1	2	2	2	1	1	2	1	3	176	2	-6	-6	
19	-9	-9	-9	-9.00	-9.00	-9.000000	-3	-9.00000	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	
20	-6	-6	-6	-6.00	-6.00	-6.000000	-3	-6.00000	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	
21	-9	-9	-9	-9.00	-9.00	-9.000000	-3	-9.00000	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	
22	1	1	1	-6.00	-6.00	-6.000000	-3	720.26305	1	2	2	2	1	2	2	2	-6	-6	2	-6	-6	

Showing 1 to 24 of 4,242 entries

F1. Now I would like to ask you some questions about your housing situation. Have you moved {since {DATE OF LAST INTERVIEW}/in the last four years}?

YES 1

NO ..... 2 ➡ **GO TO F7**

REFUSED ..... -1 ➡ **GO TO F7**

DON'T KNOW ..... -2 ➡ **GO TO F7**

BOX F1

IF THE FATHER IS MARRIED TO OR LIVING WITH THE MOTHER (A4 = 1 OR 4), GO TO F24.

ELSE, GO TO F1.

F1. Now I would like to ask you some questions about your housing situation. Have you moved {since {DATE OF LAST INTERVIEW}/in the last four years}?

YES 1

NO ..... 2 ➨ **GO TO F7**

REFUSED ..... -1 ➨ **GO TO F7**

DON'T KNOW ..... -2 ➨ **GO TO F7**

F1A. How many times have you moved {since {DATE OF LAST INTERVIEW}/in the last four years}?

|___|___|
ENTER NUMBER OF MOVES
OR
REFUSED ..... -1
DON'T KNOW ..... -2

F2. What is your current housing situation? Please stop me when I read the statement that describes your situation. Do you . . .

CODE ONE

Rent your own apartment or house, ... 1➡ **GO TO F4**

Live with family or friends who rent and you contribute part of the rent,..... 2➡ **GO TO F4**

Live with family or friends who rent but you do not pay rent,..... 3 ➡ **GO TO F5**

Own your own home, ... 4➡ **GO TO F3**

Live in a house or condo owned by another family member, ... 5➡ **GO TO F3**

Live in temporary housing or a group shelter, or..... 6➡ **GO TO F7**

Do you live in some other housing arrangement? (SPECIFY) ..... 91➡ **GO TO F3**

_____

HALFWAY HOUSE/TREATMENT FACILITY ..... 8➡ **GO TO F7**

JAIL/PRISON..... 9➡ **GO TO F7**

ON THE STREET, HOMELESS..... 10➡ **GO TO F7**

REFUSED..... -1➡ **GO TO F4**

DON'T KNOW..... -2➡ **GO TO F4**

F3. Approximately, how much do you think {you/they} could sell this home for today?

PROBE FOR APPROXIMATE AMOUNT.

$ |___|,|___|___|___|,|___|___|___|
ENTER AMOUNT
OR
REFUSED.....-1
DON'T KNOW.....-2

F3A. Approximately, how much do {you/they} owe on this house?

$ |___|,|___|___|___|,|___|___|___|
ENTER AMOUNT
OR
REFUSED.....-1
DON'T KNOW.....-2

F3B1. Whose name is on the mortgage for this house?

CODE ONE

FATHER'S NAME ONLY ..... 1➡ **GO TO BOX F3C**

MOTHER'S OR CURRENT PARTNER'S NAME ONLY ..... 2➡ **GO TO BOX F3C**

BOTH FATHER'S NAME AND MOTHER'S OR CURRENT PARTNER'S NAMES ..... 3➡ **GO TO BOX F3C**

FAMILY MEMBER(S) ON THE MOTHER'S OR CURRENT PARTNER'S SIDE .... 4➡ **GO TO BOX F3C**

FAMILY MEMBER(S) ON THE FATHER'S SIDE ..... 5➡ **GO TO BOX F3C**

OTHER (SPECIFY)..... 91➡ **GO TO BOX F3C**

REFUSED..... -1➡ **GO TO BOX F3C**

DON'T KNOW..... -2➡ **GO TO BOX F3C**

BOX F3C

IF RESPONDENT LIVES IN A HOUSE OR CONDO OWNED BY ANOTHER FAMILY MEMBER (F2=5), GO TO F4.

ELSE, GO TO F7.

F2. What is your current housing situation? Please stop me when I read the statement that describes your situation. Do you . . .

CODE ONE

Rent your own apartment or house, ... 1➡ **GO TO F4**

Live with family or friends who rent and you contribute part of the rent,..... 2➡ **GO TO F4**

Live with family or friends who rent but you do not pay rent,..... 3 ➡ **GO TO F5**

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Do you live in some other housing arrangement? (SPECIFY) ..... 91➡ **GO TO F3**

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HALFWAY HOUSE/TREATMENT FACILITY ..... 8➡ **GO TO F7**

JAIL/PRISON..... 9➡ **GO TO F7**

ON THE STREET, HOMELESS..... 10➡ **GO TO F7**

REFUSED..... -1➡ **GO TO F4**

DON'T KNOW..... -2➡ **GO TO F4**

This process is time consuming.

The New York Times

For Big-Data Scientists, 'Janitor Work' Is Key Hurdle to Insights

Monica Rogati, Jawbone's vice president for data science, with Brian Wilt, a senior data scientist.

Peter DaSilva for The New York Times

https://www.nytimes.com/2014/08/18/technology/for-big-data-scientists-hurdle-to-insights-is-janitor-work.html

This process is error prone.

Correction: "Her Support, His Support: Money, Masculinity, and Marital Infidelity"
American Sociological Review
80(3):469–95

This process is error prone.

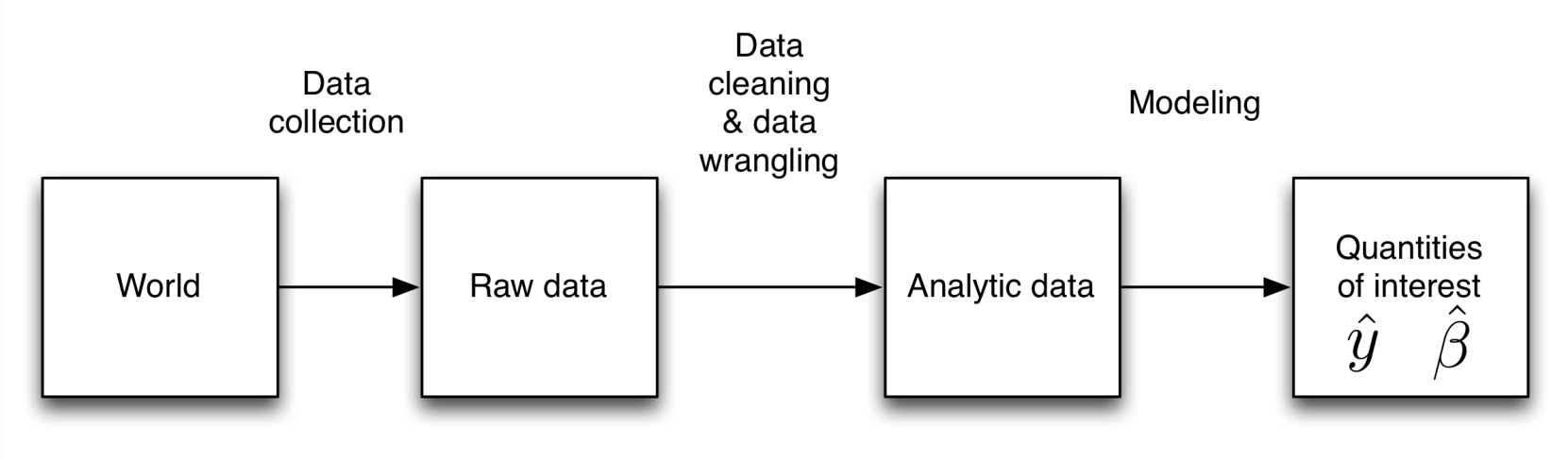
I made several errors related to the coding of missing data in my June 2015 *ASR* article, "Her Support, His Support: Money, Masculinity, and Marital Infidelity." Upon discov-

This process is frustrating.

https://www.talk2solicitors.co.uk/blog/limits-frustration-contract/

Now imagine this times 100.

Now imagine this times 100. We think this data preparation step is a critical barrier to applying machine learning methods to complex survey data.



What if this data was as easy to use as your iPhone?

Human-readable $\rightarrow$ machine-actionable

- Big team effort: Alexander T. Kindel, Vineet Bansal, Kristin Catena, Tom Hartshorne, Kate Jaeger, Dawn Koffman, Sara McLanahan, Maya Philips, Shiva Rouhani, Ryan Vinh, Matthew J. Salganik

- Big team effort: Alexander T. Kindel, Vineet Bansal, Kristin Catena, Tom Hartshorne, Kate Jaeger, Dawn Koffman, Sara McLanahan, Maya Philips, Shiva Rouhani, Ryan Vinh, Matthew J. Salganik
- Key principle: metadata is data
- see Kindel et al (2018) "Improving metadata infrastructure for complex surveys: Insights from the Fragile Families Challenge

Data preparation

There are a lot of missing entries in the data matrix

Data preparation

Not all missing data is the same

- -9 Not in wave - Did not participate in survey/data collection component
- -6 Valid skip - Intentionally not asked question; question does not apply to respondent or response known based on prior information.
- -2 Don't know - Respondent asked question; responded "Don't Know".
- -1 Refuse - Respondent asked question; refused to answer question
- NA also used occasionally

Given that we have only a few hours, I would recommend not worrying about this. In the special issue, we saw some evidence that complex approaches to missing data didn't help much.

Data preparation

You'll want to deal with unordered categorical variables

F3B1. Whose name is on the mortgage for this house?

CODE ONE

FATHER'S NAME ONLY ..... 1➡ **GO TO BOX F3C**

MOTHER'S OR CURRENT PARTNER'S NAME ONLY ..... 2➡ **GO TO BOX F3C**

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FAMILY MEMBER(S) ON THE FATHER'S SIDE ..... 5➡ **GO TO BOX F3C**

OTHER (SPECIFY)..... 91➡ **GO TO BOX F3C**

_____

REFUSED..... -1➡ **GO TO BOX F3C**

DON'T KNOW..... -2➡ **GO TO BOX F3C**

BOX F3C

IF RESPONDENT LIVES IN A HOUSE OR CONDO OWNED BY ANOTHER FAMILY MEMBER (F2=5), GO TO F4.

ELSE, GO TO F7

What are the main "recipes" that people used in the Fragile Families Challenge?

- data preparation
- feature selection
- statistical learning

Here are the approaches that authors used for data preparation (Key ideas relate to missing data and unordered categorical variables):

- Mean, median, mode imputation
- Missingness indicators
- Model-based imputation
- Imputation based on survey structure
- Constructed variables
- Principle component analysis
- One-hot encoding (dummy variables)
- Standardization
- Transformation

Here are the approaches that authors used for feature selection/variable selection (Key ideas relate to automatic vs manual):

- Prior expertise
- Study documentation
- Literature review
- F-test
- Mutual information
- Dropping low-variance features
- Multiple datasets
- Own train/test split

Here are the approaches that authors used for statistical learning (Key ideas are flexibility and over-fitting):

- general linear model (linear and logistic regression)
- Tree-based methods (e.g., random forrest, gradient boosted trees)
- Regularization approaches (e.g., LASSO, Ridge, Elastic Net)

What are the main "recipes" that people used in the Fragile Families Challenge?

- data preparation
- feature selection
- statistical learning

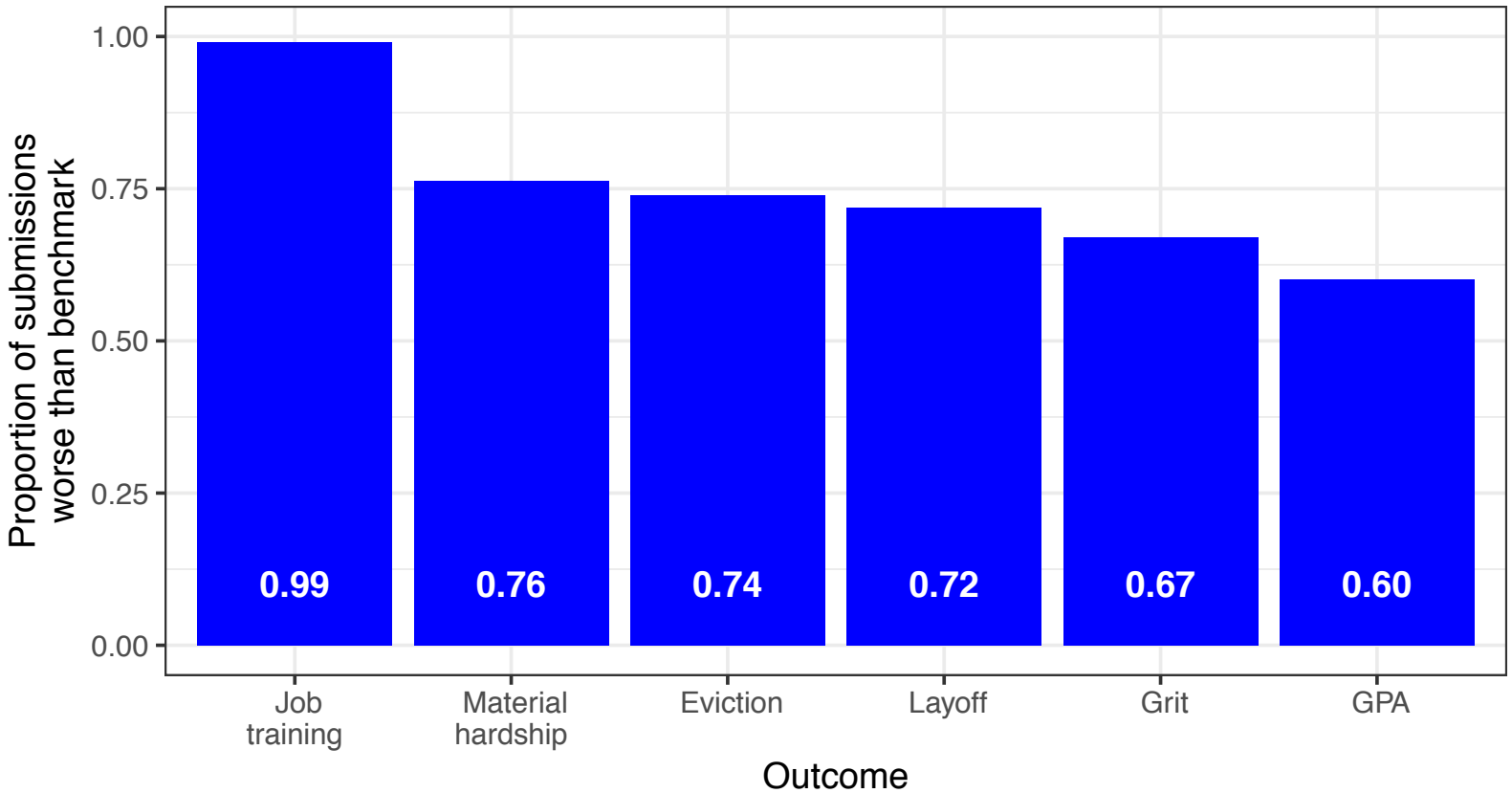
Getting started

We created a template submission zip file that includes:

- predictions.csv (one prediction per family per outcome)
- narrative (a text file explaining the approach)
- baseline.R (code to run the submission)

You can upload it here:

https://codalab.fragilefamilieschallenge.org/competitions/26


Proportion of submissions worse than benchmark
1.00
0.75
0.50
0.25
0.00
0.99
0.76
0.74
0.72
0.67
0.60
Job training
Material hardship
Eviction
Layoff
Grit
GPA
Outcome

Good luck and enjoy