Bansak et al (2018), "Improving refugee integration through data-driven algorithmic assignment."

Sociology Statistics Reading Group

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29 March 2018

Outline

1. Context
2. Data & methodology
3. Machine learning for public policy

Institutional/political context

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  - Of these, only ~14% are put forward (annually).
- With limited options, important to achieve best possible outcomes for those resettled.

Growing body of research

Transfer systems

- Countries buy and sell refugee resettlement quotas (Hathaway and Neve 1997, Schuk 1997, Bubb, Kremer, and Levine 2011, Moraga and Rapoport 2014).
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Bansak et al identify "practical barriers," noting: "in contrast, our data-driven approach can be immediately implemented by using existing data to optimize integration outcomes" (326).

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Method:

- Model
- Map
- Match

Data

United States

- Information on 33,728 working-age refugees resettled 2011-2016.
  - 43 locations: those receiving 200+ over entire period.
  - Covariates: sex, English-speaking, age, education, origin country, year & month of arrival, employment status.
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- Asylum seekers receiving subsidiary protection 1993-2013 (n=22,159).
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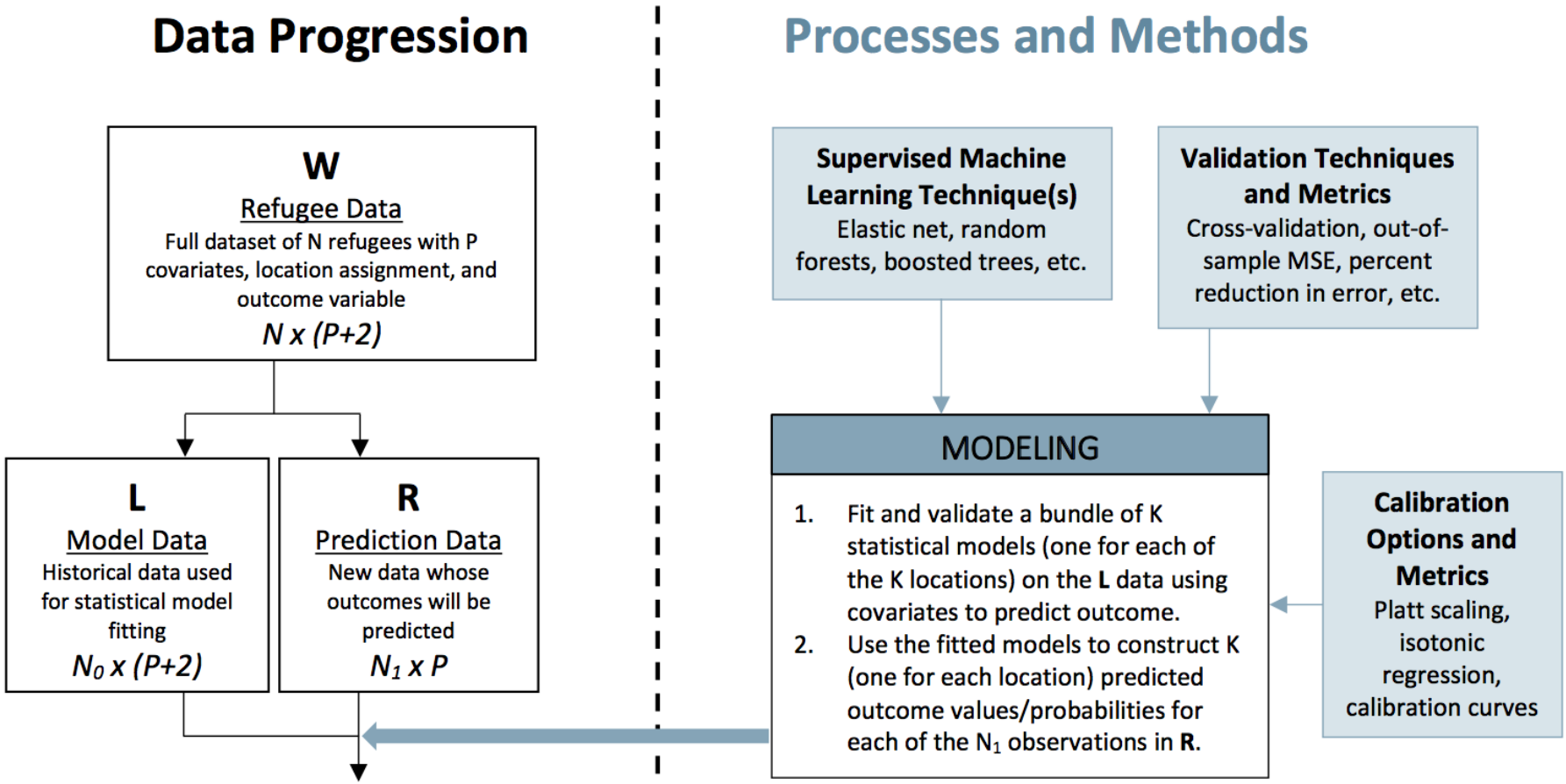
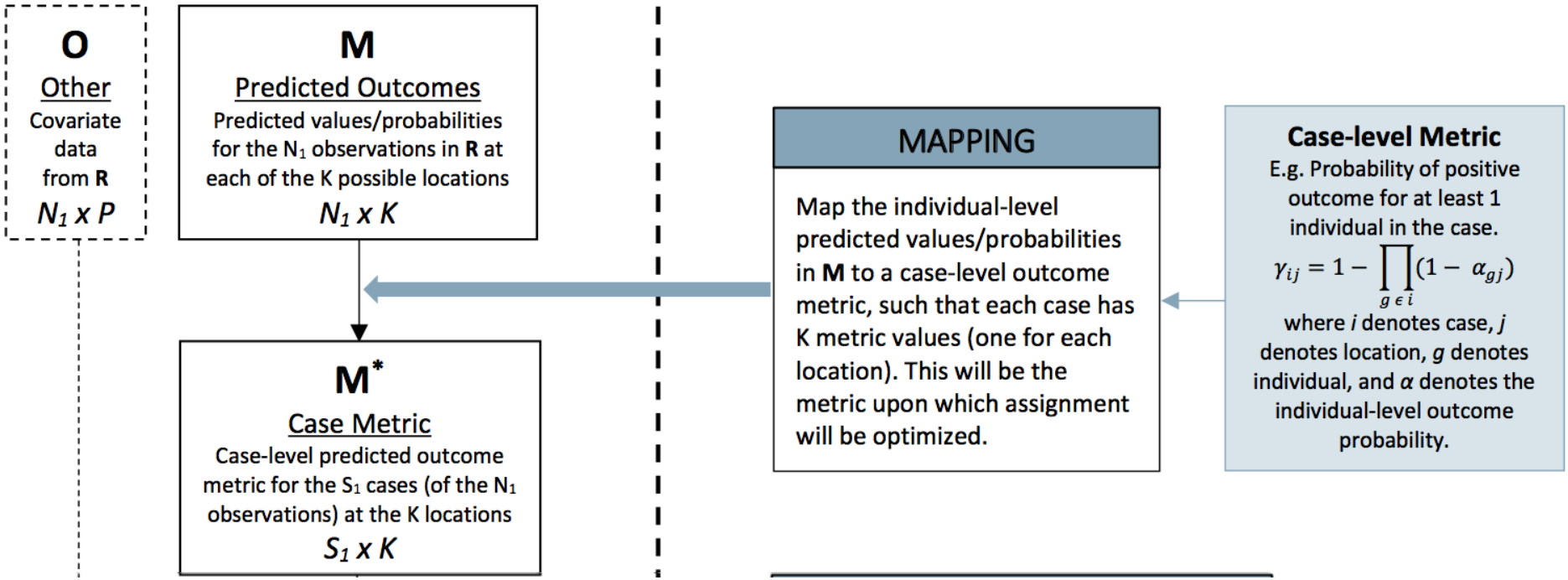
Training/test split is the key to this whole endeavor!

Step One: Model

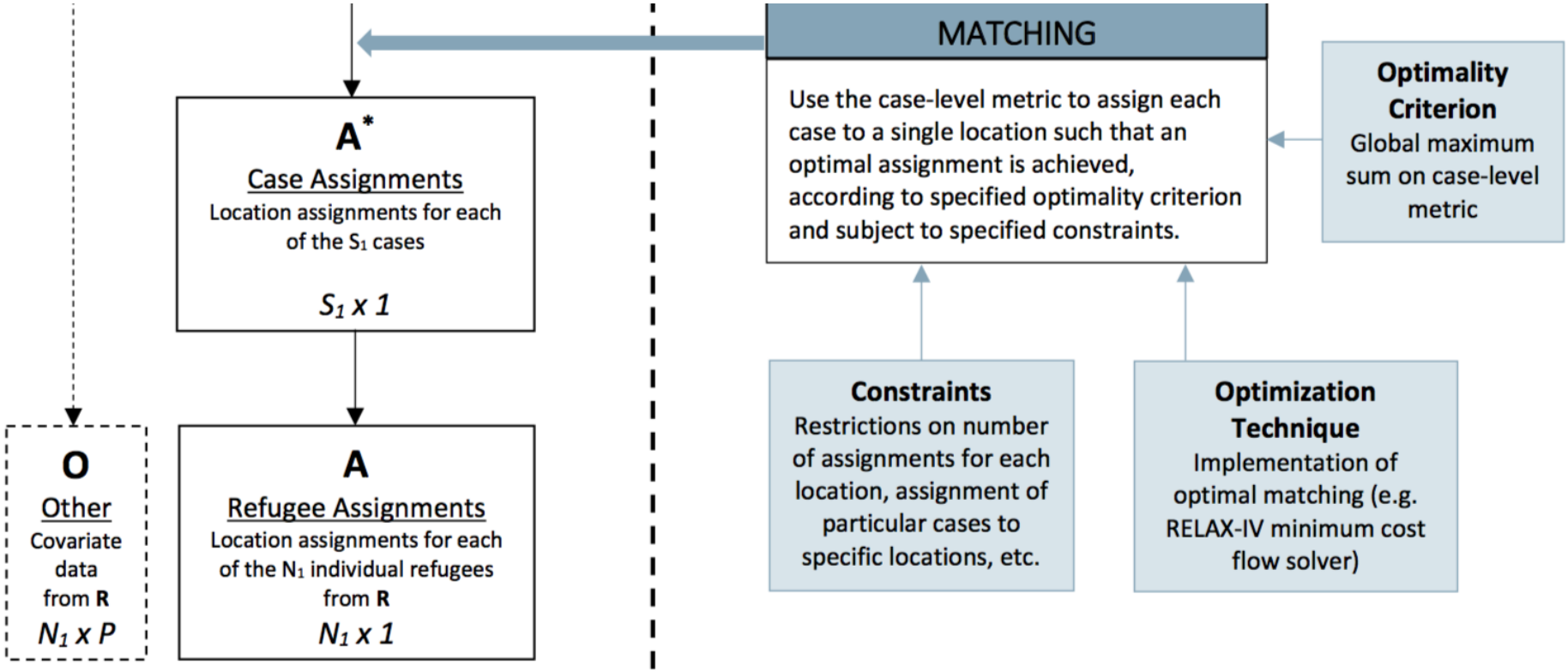
Fig. S3: **Data-driven algorithm for refugee assignment.** Figure shows a schematic of the main stages of the algorithm.



Step Two: Map


O
Other
Covariate data from R
$N_1 \times P$
M
Predicted Outcomes
Predicted values/probabilities for the N_1 observations in R at each of the K possible locations
$N_1 \times K$
M^*
Case Metric
Case-level predicted outcome metric for the S_1 cases (of the N_1 observations) at the K locations
$S_1 \times K$
MAPPING
Map the individual-level predicted values/probabilities in M to a case-level outcome metric, such that each case has K metric values (one for each location). This will be the metric upon which assignment will be optimized.
Case-level Metric
E.g. Probability of positive outcome for at least 1 individual in the case.
$\gamma_{ij} = 1 - \prod_{g \in i}(1 - \alpha_{gj})$
where i denotes case, j denotes location, g denotes individual, and α denotes the individual-level outcome probability.

Step Three: Match



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- Predicted probability of employment for median refugee approximately doubled in both countries.
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This is huge, but...

- Simulating outcome based on old system.
- No one will ever agree to do an RCT of this.

Personalized policy

- Often we target policies to the average person, or a group based mainly on location.
- These methods enable us to (potentially) choose the best treatments for individual groups or people.
- Other applications you can think of?

Ethics

- Main pushback has been lack of refugee choice.
- Is this is still an improvement over the status quo?
- People get weird about computers making human-impact decisions.

Broader questions on social science for policy

- Impressive attempt to tailor to current context, but does not fully reflect reality in some key ways.
  - E.g. sociopolitical context at destination as major integration factor.
- Think-tank industry built to narrow distance between research and policy, but gaps remain.
- Should we still design research explicitly targeting policy even with missing/inaccurate information and/or low chance of implementation?