Wharton University of Pennsylvania | CSSLab

Do nudges work?

To navigate the literature, we need a map

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Joint work with Duncan Watts at the CSS Lab at Penn

CSSLab

The Fall 2023 Cartography Team

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Which nudge works best?

It depends.

On what?

The behavior, context, people…

How about for our project?

We don’t know…run an experiment?!

Dellavigna & Linos, 2022

We don't know...

Generalizability

We don't know which features matter

(Bryan et al., 2021; Hallwsorth 2022; Simons et al., 2017; Szaszi et al., 2018; Vivalt 2020; Yarkoni 2020)

Transparency

We don't document all features

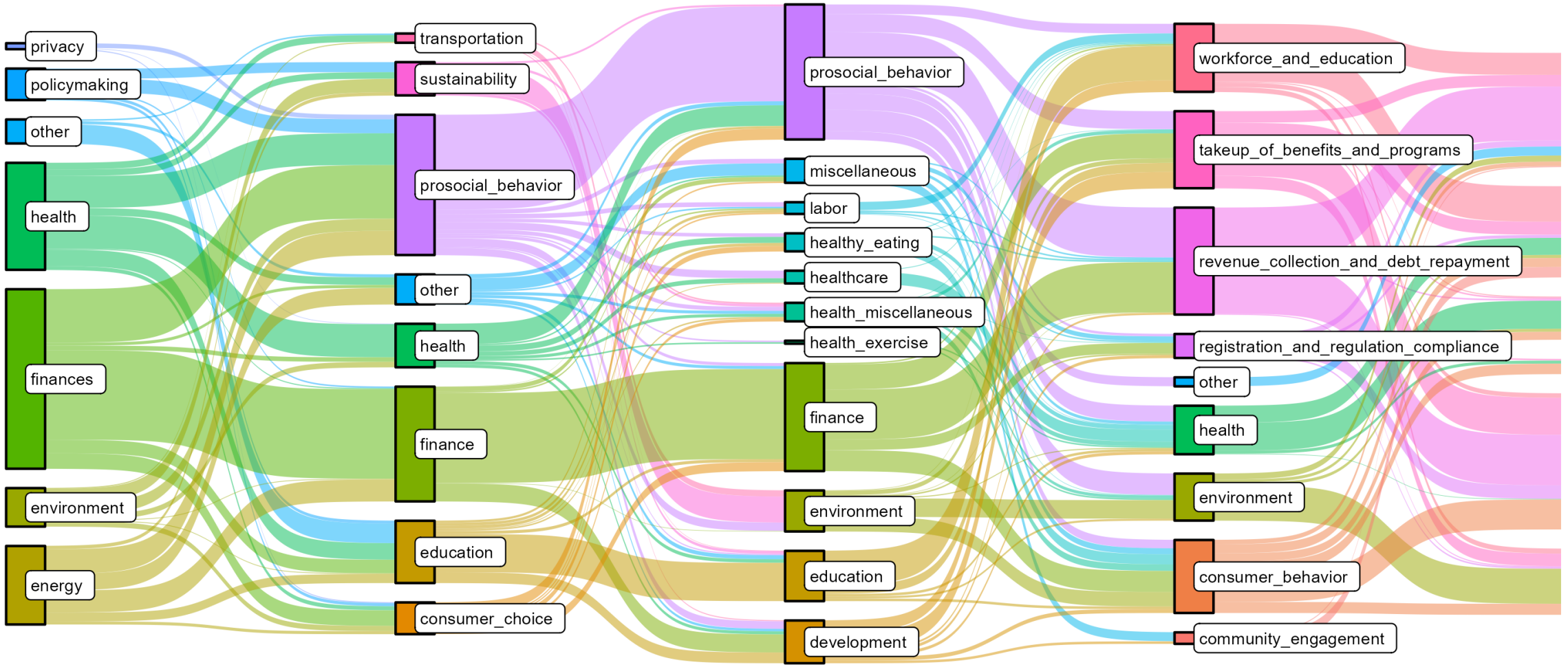
(Christensen, Freese & Miguel, 2019; Hoekstra & Vazire 2021; Nature Human Behavior Editorial Team, 2020; Munafo et al., 2017)

Commensurability

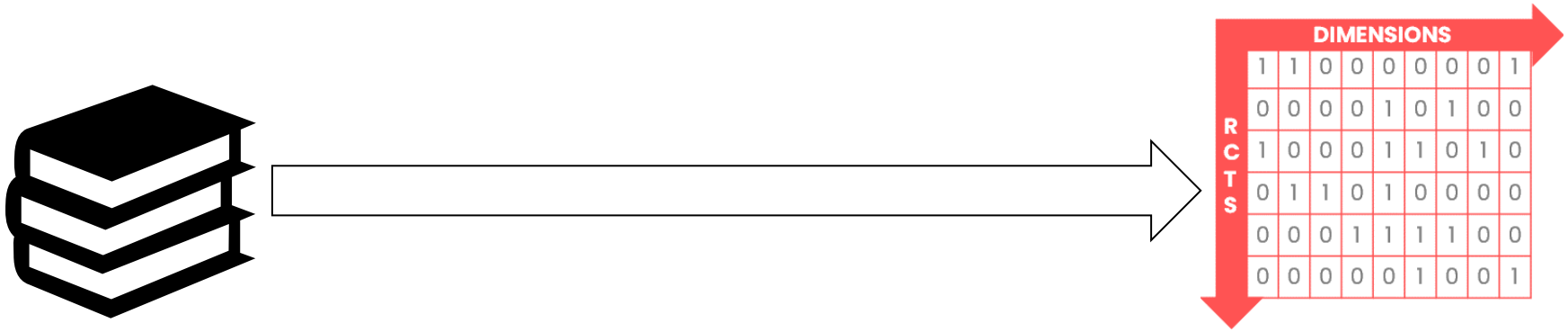
We don't speak the same language

(Almaatouq et al., 2022; Mischel 2008; Scheel 2022; Watts 2017)

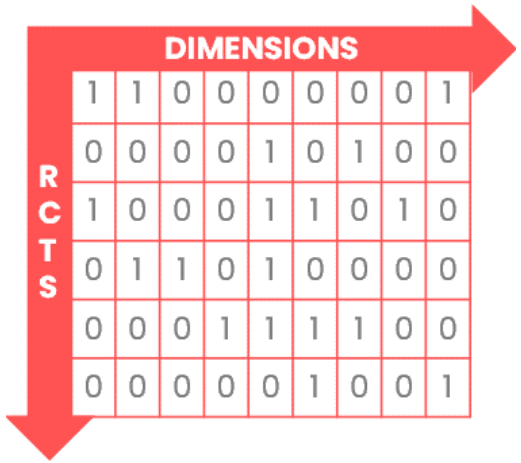
What's the *domain* of a study ? (N=155)



Hummel & Maedche, 2019 **Szaszi et al., 2018** **Beshears & Kowosky, 2020** **Dellavigna & Linos, 2022** **Mertens et al., 2022**



We use papers to not only *share* but *store* knowledge.



Szaszi et al., 2018 (nudges)
Hummel & Maedche, 2019 (nudges)

Systematic reviews

Mertens et al., 2022 (nudges)
Dellavigna & Linos, 2022 (nudges)

Meta-analyses

Athey et al., 2022 (giving)
Brody et al., 2022 (vaccines)
Zhao et al., 2022 (lab nudges)

Heterogeneity analyses

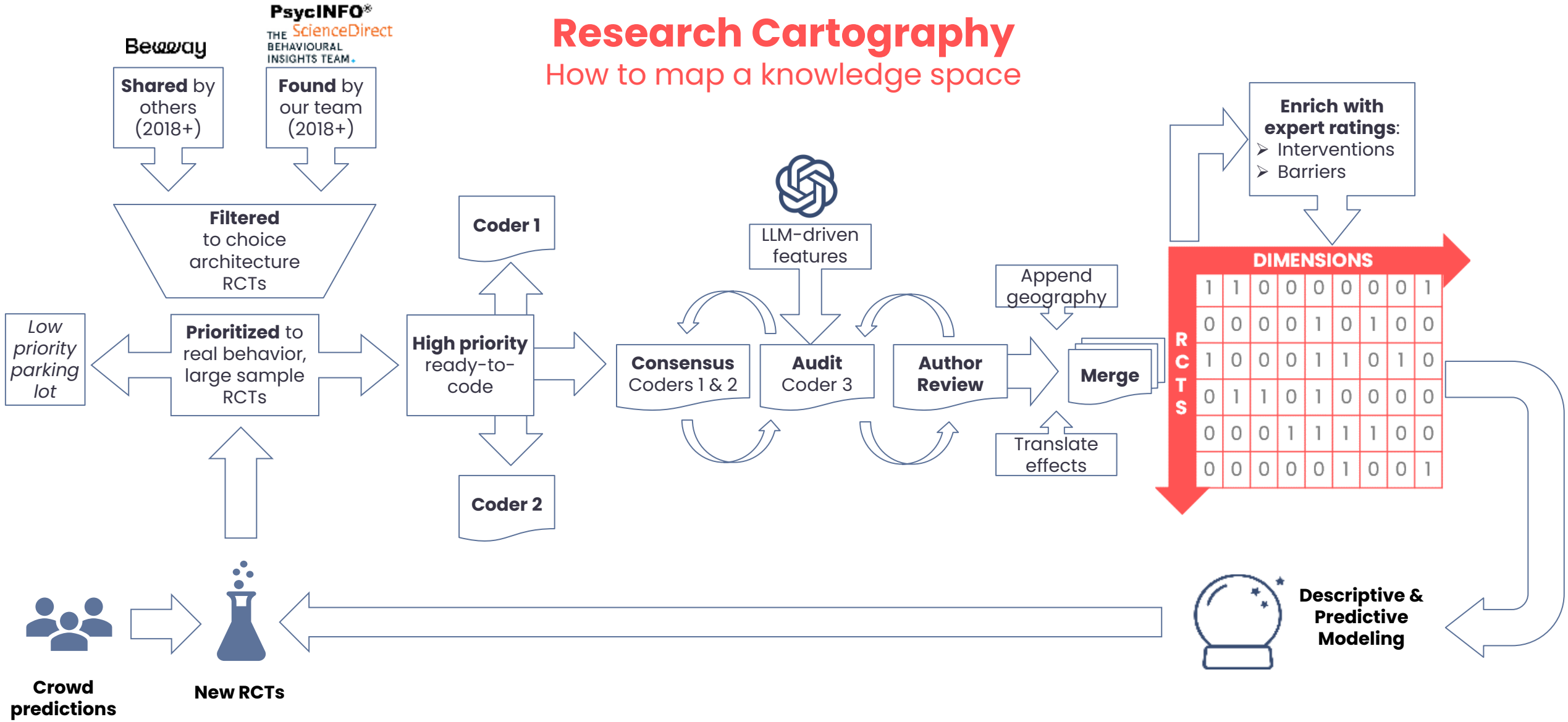
Altmedj et al., 2019 (lab studies)
Vivalt 2020 (development)
Dai et al., working paper (COVID)

Meta-prediction analyses

Building a database of cumulative evidence

Research Cartography

How to map a knowledge space

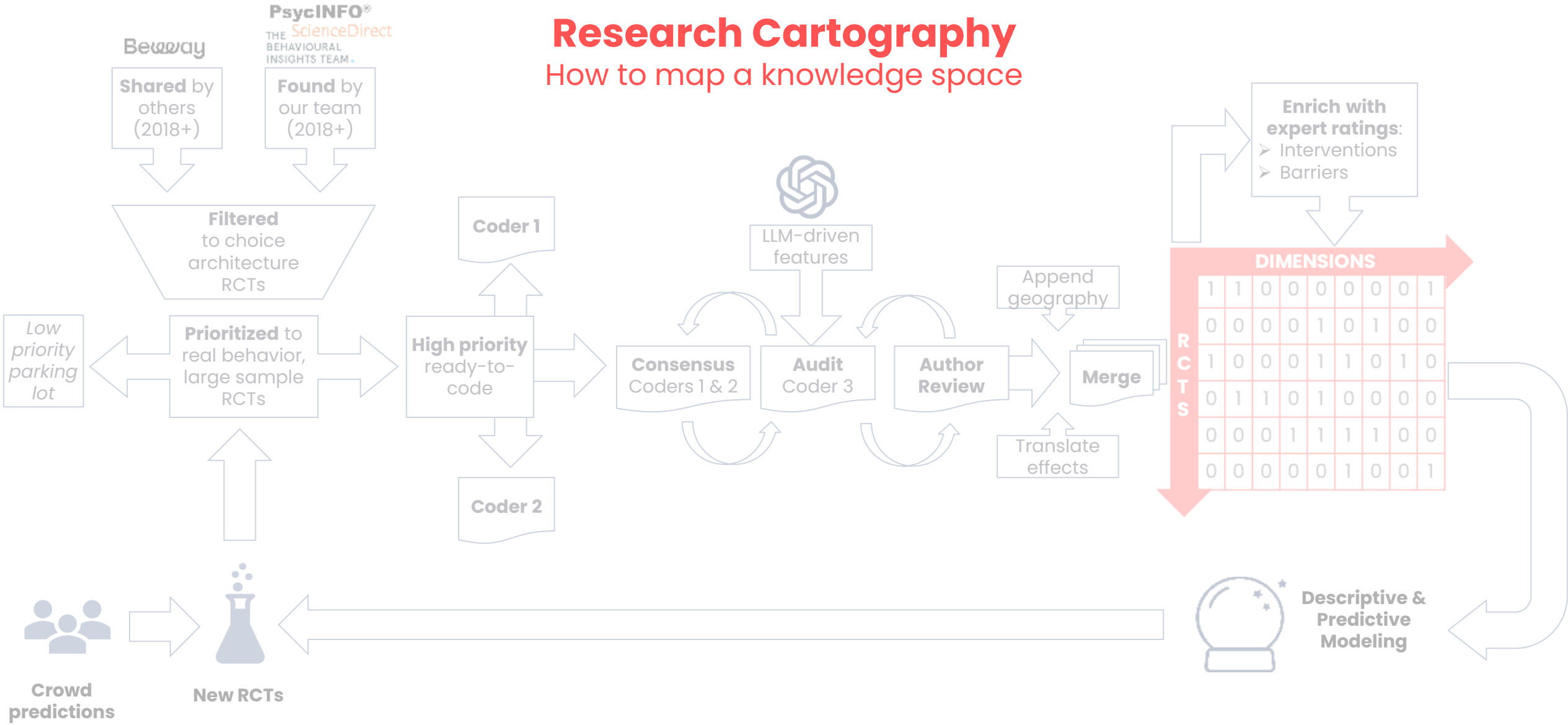


"Research Cartography"
Almaatouq et al., (2022). Beyond playing 20 questions with nature: Integrative experiment design in the social and behavioral sciences.

Processes powered by

Research Cartography

How to map a knowledge space

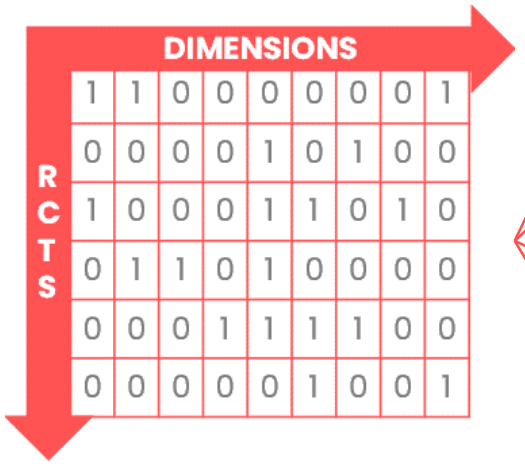


18 months

155 RCTs (of **600+** reviewed)

400+ dimensions

Processes powered by R G



Explore: Find promising “empty” regions

Translate: Unify existing theories

Explain: Build new theories

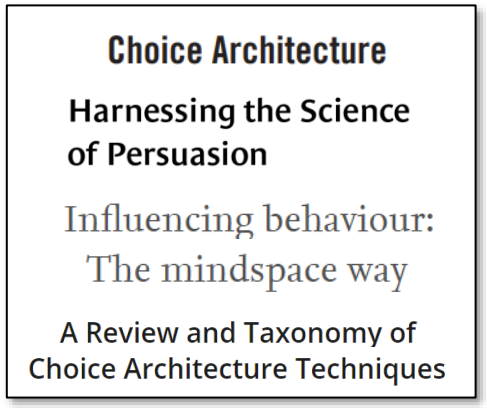
Predict: Answer

Which nudge works best?

Translate:

A computational approach to commensurability

56 nudge concepts
6 frameworks



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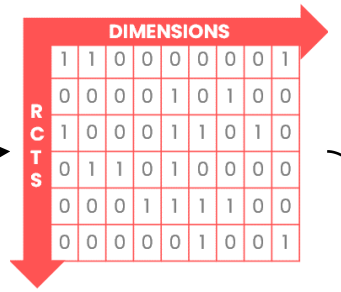
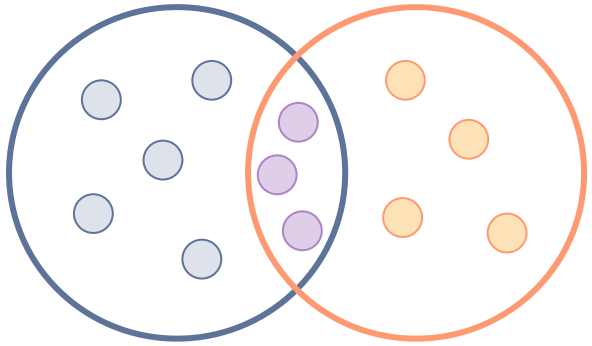


$$sim(nudgeA, nudgeB) = \frac{shared}{shared + onlyA + onlyB}$$

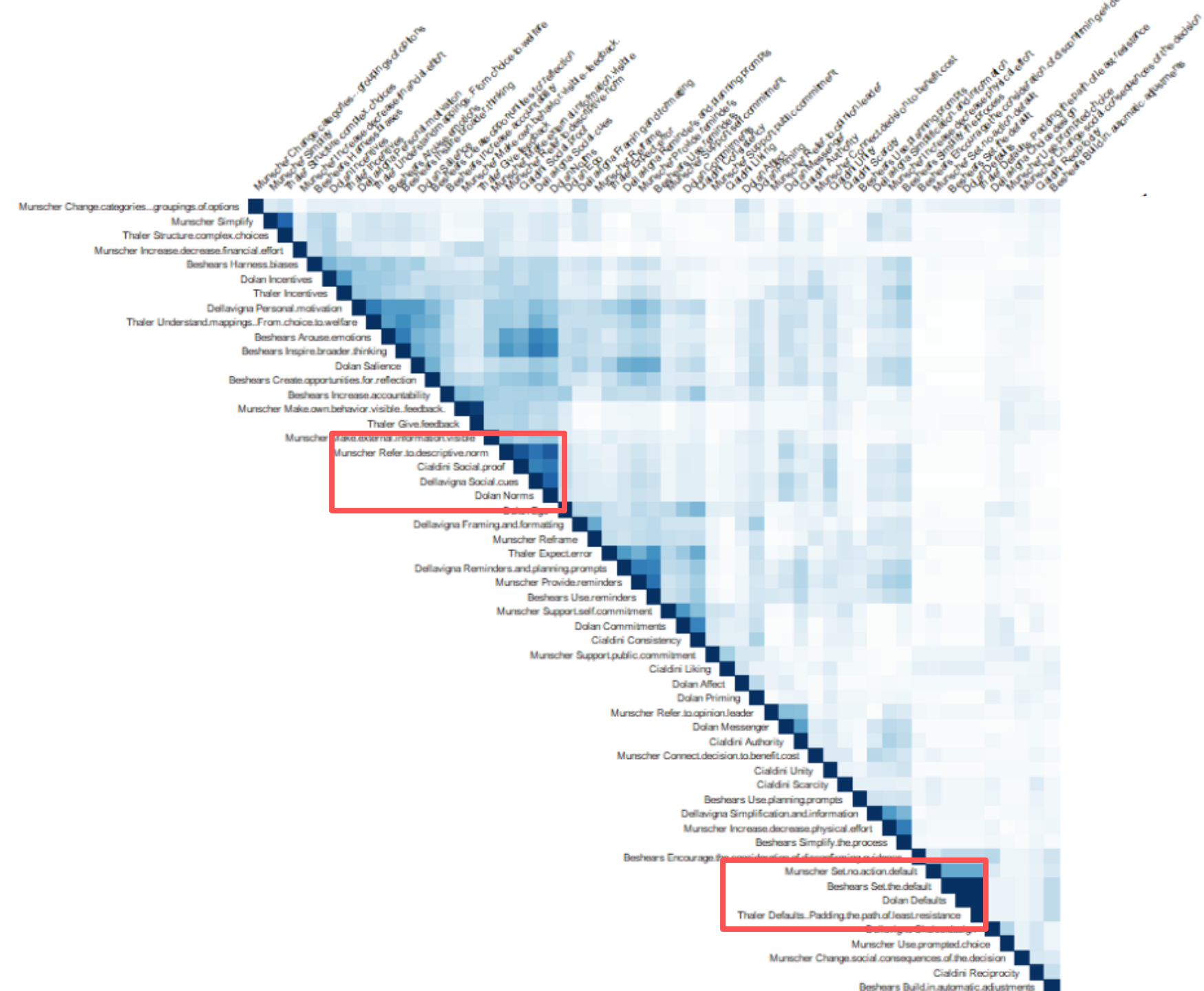
Independent

Calibrate

Nudge concept A



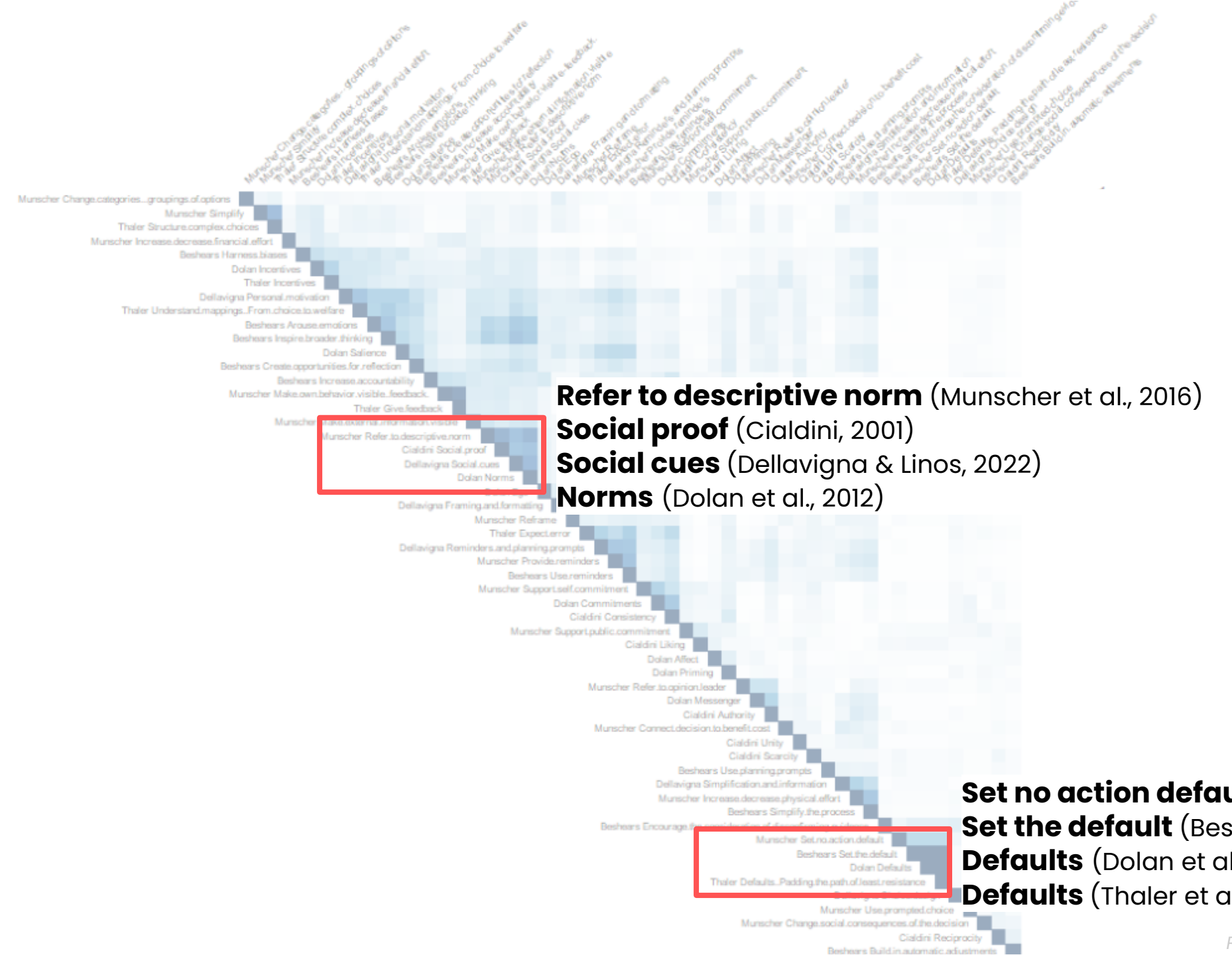
Nudge concept B



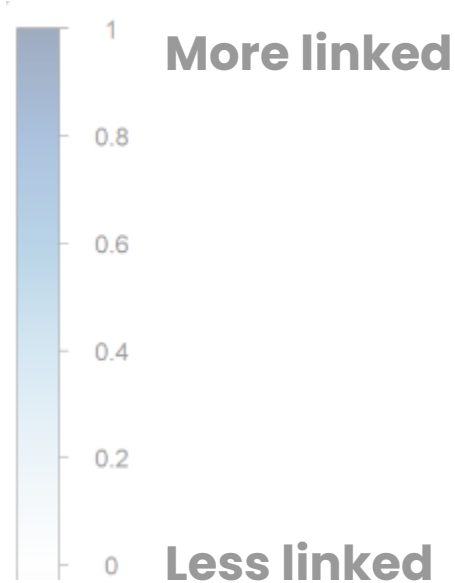
More linked

Less linked

Preliminary results (N=74 RCTs w/56 concepts)

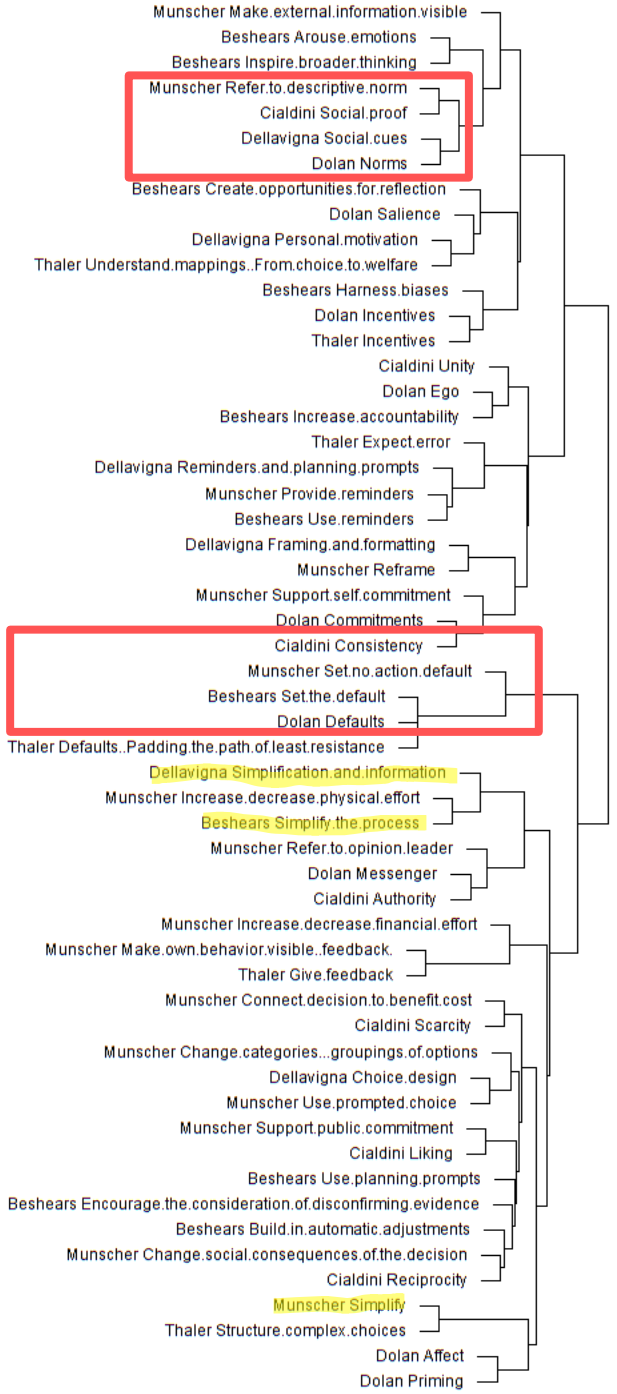


Refer to descriptive norm (Munscher et al., 2016)
Social proof (Cialdini, 2001)
Social cues (Dellavigna & Linos, 2022)
Norms (Dolan et al., 2012)



Set no action default (Munscher et al., 2016)
Set the default (Beshears & Gino, 2016)
Defaults (Dolan et al., 2012)
Defaults (Thaler et al., 2014)

Preliminary results (N=74 RCTs w/56 concepts)



Munscher Refer.to.descriptive.norm
Cialdini Social.proof
Dellavigna Social.cues
Dolan Norms

Norms

Munscher Set.no.action.default
Beshears Set.the.default
Dolan Defaults
Thaler Defaults..Padding.the.path.of.least.resistance

Defaults

Dellavigna Simplification.and.information
Munscher Increase.decrease.physical.effort
Beshears Simplify.the.process

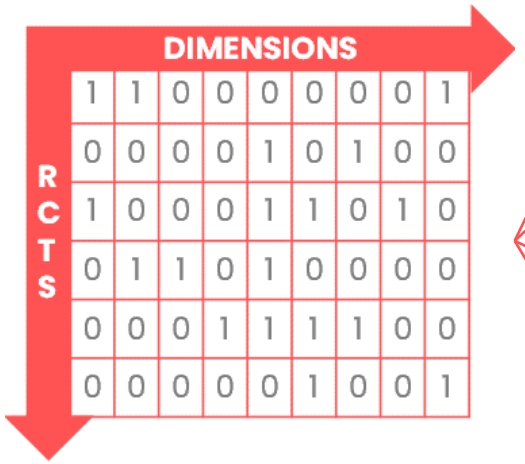
~ **Reduce** *any* **effort**

Simplify ≠ Simplify

Munscher Simplify
Thaler Structure.complex.choices

~ **Reduce** *cognitive* **effort**
(w/o reducing options)

Preliminary results (N=74 RCTs w/56 concepts)



Explore: Find promising "empty" regions

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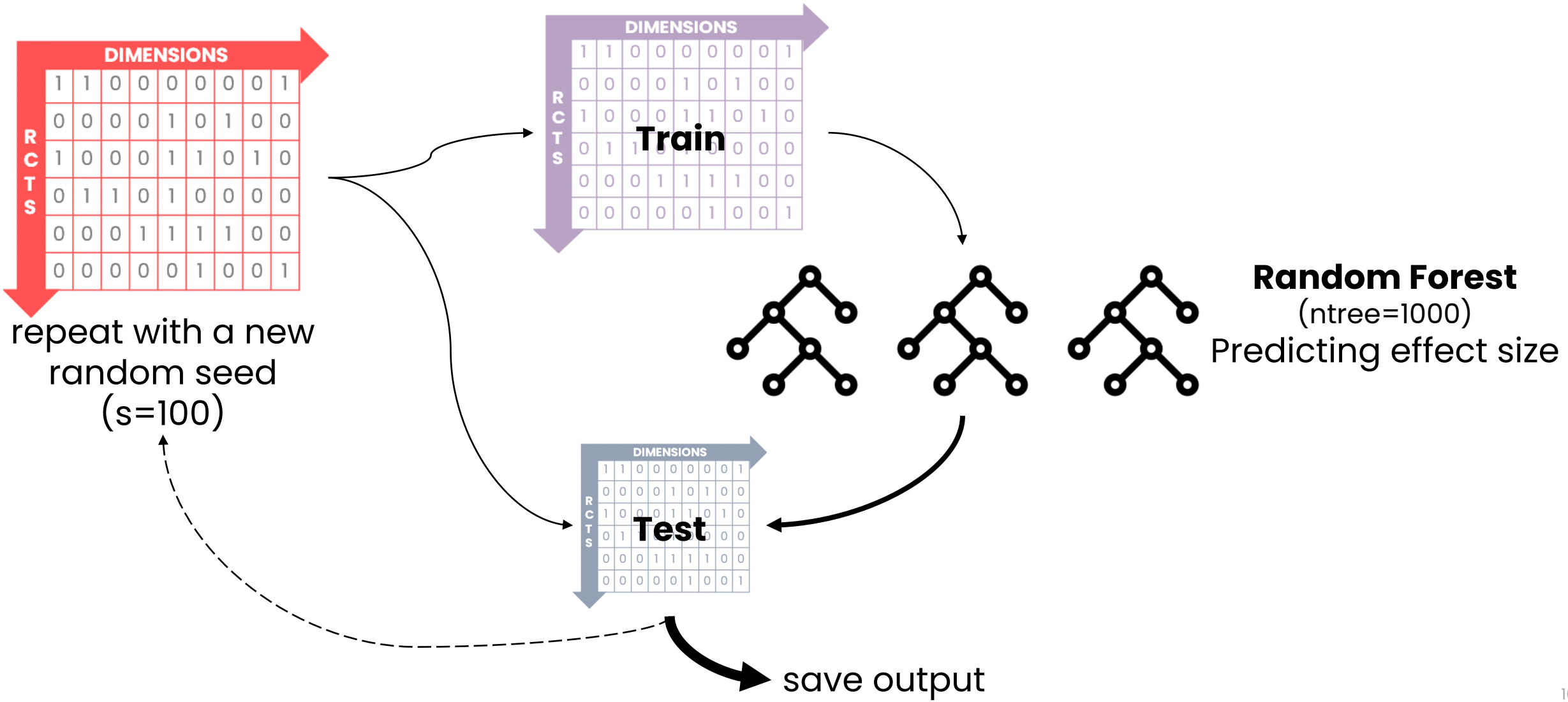
Predict: Answer

Which nudge works best?

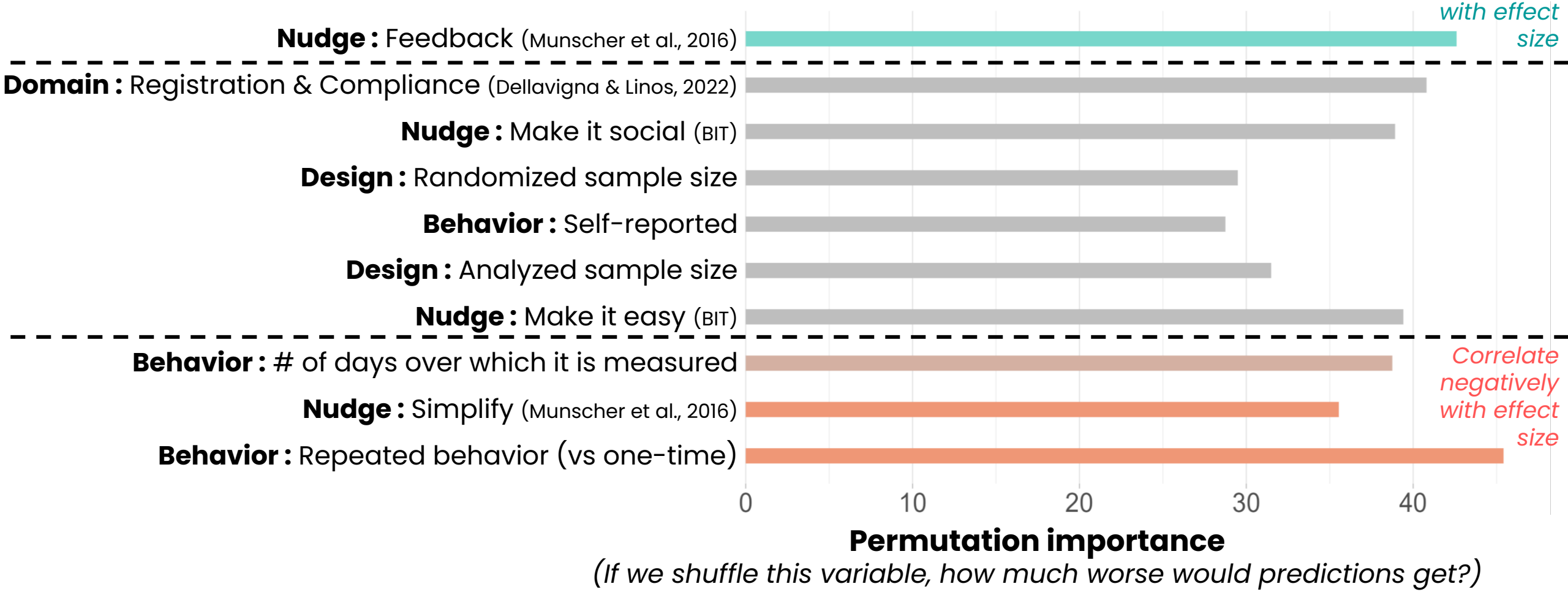
Predict: Which nudge works best?

Random Forest | 80% Train, 20% Test | looped over 100 seeds
(Altmedj et al., 2019)

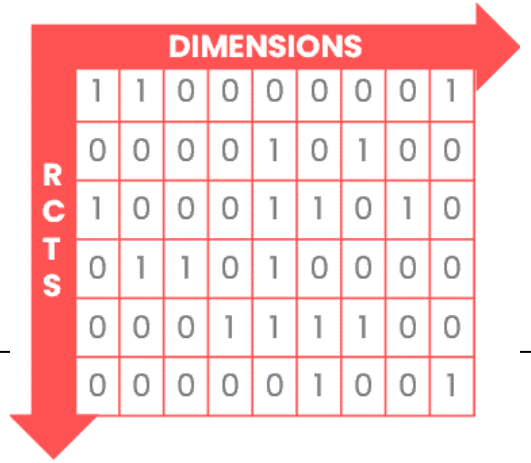


Predict: Which nudge works best?

reproducible
auditable
improvable



A long to-do list



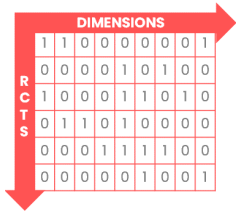
1. Add RCTs, refine dimensions, tune model specifications
2. Migrate more dimensions to our **LLM-human** "v2" process
3. Integrate **homogenous subsets of RCTs** (corporate partners)
4. Continue our pipeline for **integrative evidence** (map → RCT → map)

Which nudge works best?

How can we “know what we know” as a field if we cannot computationally combine different sources of evidence?

Prediction requires truly cumulative science.

We may be asking too much of our scientific papers – *sharing* vs. *storing* knowledge



Thank you!

This ambitious project would not be possible without our **funders**, **field partners**, **advisory board**, & **dedicated team**!

Advisors / Board: Colin Camerer, Angela Duckworth, Duncan Watts

Current Team: Anushka Bhansali, Nicole Grabel, Yang Huang, Aravika Khosla, Anoushka Kiyawat, Maatangi Krishna, Anna Lamb, Ana Pimienta, Eric Shapiro, Mia Shelton, Shannon White, Ricky Wang

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