Assessing Innovation in Mental Health Research

An Analysis of Senior and Junior Principal Investigators

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Motivation: funding & innovation are **not distributed equally**

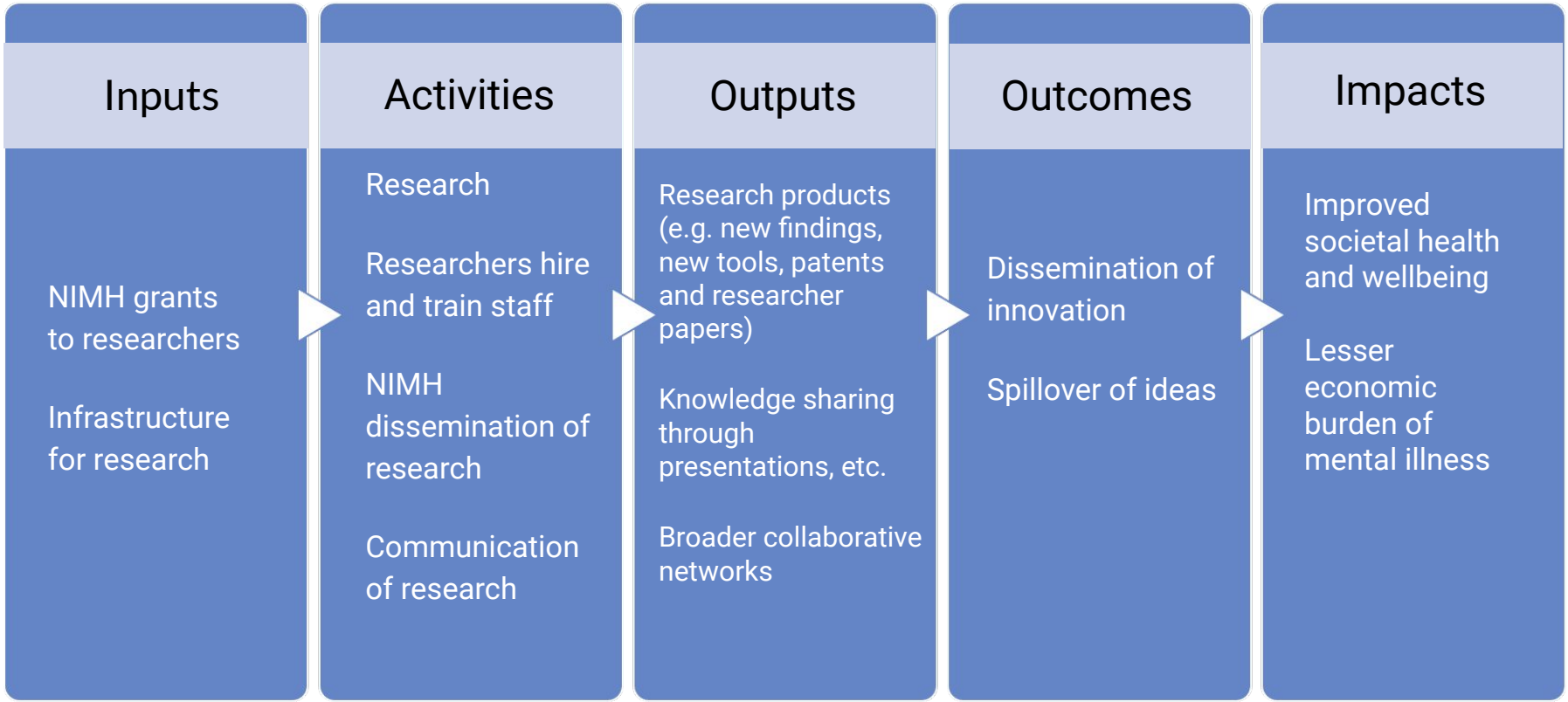
- The distribution of NIMH grant funding is highly skewed, with 10% of researchers receiving 60% of funding in the period between 2010 and 2018.[1]

- Some studies suggests that conceptual innovation is driven by researchers who are newer to a field.[2]

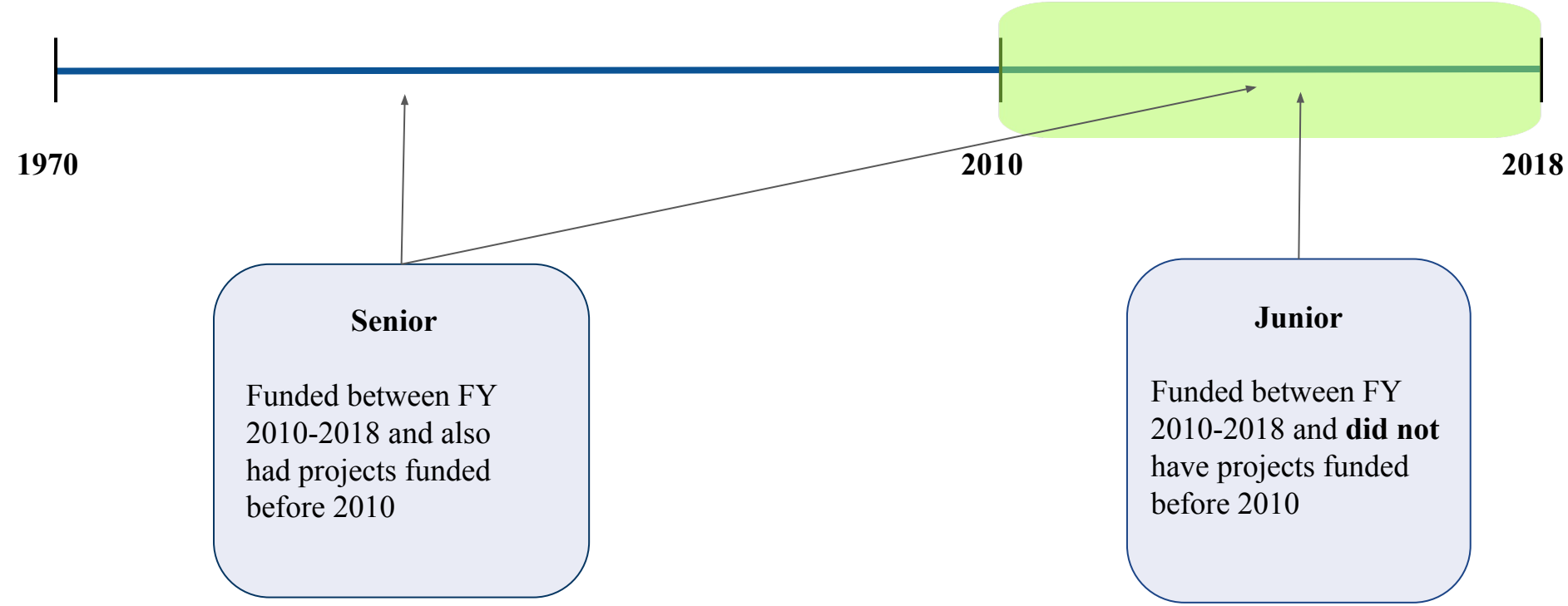
Research Question

To what extent does federal NIMH funding and patenting activity (as a proxy for innovation) differ between **junior** and **senior** researchers?

Theory of Change



Defining **Junior** and **Senior** Researchers



Analysis & Approach

Data	• Grants: Federal RePORTER (2010-2018) • Patents: PatentsView (2010-2018)
Unit of Analysis	• Principal Investigators (Junior & Senior)
Methodology	• Descriptive statistics, data management, visualizations, record linkage, and text analysis
Measures of Interest	• Patent activity • Federal research funding through NIMH*

*Not comprehensive of all mental health research funding. Some mental health funding comes through other federal agencies, (e.g. FDA), which we **did not** examine.

Juniors receive **less funding** & have **fewer patents** than senior counterparts

NIMH Researchers FY 2010-2018	**Junior**	**Senior**
Total researchers	2,782	3,943
Funding received (‘10-’18)	$ 4.0 billion	$ 11.0 billion
Unique grants	9,587	23,729
Total researchers with associated patents	35	172
Funding to patented research	$ 0.5 billion	$ 2.7 billion
Number of unique patents	67	318
Average funding per PI	$ 1.5 million	$ 2.8 million

Juniors may be focused newer technologies

Senior PI Topics: Research

train, research, program, core, center, mentor, career, scienc, mental health, support
neural, memori, cognit, task, process, brain, cortex, function, prefront, circuit
neuron, cell, receptor, express, regul, synapt, protein, molecular, mechan, signal
treatment, trial, depress, random, patient, outcom, intervent, medic, efficaci, effect
genet, genom, gene, phenotyp, schizophrenia, data, disord, variant, brain, identifi
hiv, infect, communiti, intervent, care, implement, prevent, hiv infect, aid, base
children, adolesc, risk, earli, age, parent, youth, stress, development, child

Junior PI Topics: Research

cell, neuron, synapt, protein, receptor, regul, mice, express, molecular, mous
train, research, health, implement, mental health, mentor, mental, program, career, servic
asd, children, disord, cognit, symptom, earli, development, function, neuroimag, social
memori, circuit, cortex, neural, learn, behavior, activ, prefront, fear, hippocampus
imag, brain, comput, method, tool, human, resolut, visual, data, technolog
genet, gene, genom, variant, sequenc, phenotyp, variat, identifi, gene express, disord
hiv, risk, intervent, infect, prevent, among, treatment, effect, depress, women

Senior PI Topics: Patents

imag, magnet, differ, reson, system, includ, data, generat, use, provid
acid, nucleic, cell, disclos, injuri, brain, normal, neuron, traumat, various
intend, make, psychiatr, purpos, tool, art, abstract, search, limit, neurolog
provid, method, select, screen, also, activ, use, herein, identifi, invent
present, disclosur, inhibitor, relat, base, prevent, embodi, composit, treat, system
cancer, modul, alzheim, depress, cognit, compound, subject, diseas, composit, negat
e, exampl, mediat, g, neurogenesi, activ, post, natal, general, death

Junior PI Topics: Patents

locus, bind, polypeptid, wherein, genom, interest, monom, cap, dna, effector
crispr, vector, sequenc, complex, cell, direct, provid, system, design, format
risk, determin, assay, sampl, combin, associ, genet, receptor, obtain, patient
compound, present, diseas, relat, use, treatment, level, herein, method, describ
system, provid, particular, optim, relat, compris, ortholog, engin, enzym, effect
symptom, resist, depress, patient, current, ketamin, chronic, amelior, trial, intranas
contain, thereof, alter, gene, express, agent, product, provid, one, pharmaceut

Policy Implications

Goal: Inform policymakers as to how research funding is allocated among NIMH PIs

Conclusion

NIMH funding is highly skewed in favor of senior PIs. Junior PIs are more inclined to pursue cutting-edge technologies.

Implications

Higher funding for junior PIs may boost fundamental discoveries.

Future research could examine the age of researchers being funded by NIMH.

Caveats: Limited by data and sample size

Generalizability

- Sampled only NIMH investigators

Inference

- Lack of statistical significance tests

Causality

- Non-causal findings

Measurement validity

- Productivity/innovation does not necessarily mean patenting (spillover of research, intellectual context)

Expanding with Future Research