

R03-R21 Grant Program Analysis Presentation to NIH Program Evaluation SIG October 20, 2011

Elizabeth Ruben, Jerry Phelps, Linh Pham, Helena Davis, &
Christie Drew

Program Analysis Branch
Division of Extramural Research and Training
National Institute of Environmental Health Sciences

Joshua Schnell and Duane Williams
Discovery Logic, a Thomson-Reuters Business



Introduction

Do our investments in small grants lead to successful RPG awards?

Small grants = \$120 M
between 1996-2008



Small Grant Mechanisms

- R03:
 - Maximum two years of funding
 - Direct costs up to \$50K/year
 - Not renewable
 - To support many types of projects (pilot or feasibility studies, collection of preliminary data, secondary analysis of existing data, small, self-contained research, etc.)

- R21:
 - Maximum two years of funding
 - Direct costs not to exceed \$275K for the two-year period
 - Not renewable (except when paired with the R33 mechanism)
 - Encourages new, exploratory and development research projects by providing support for early stages of project development.

Hypotheses for R03/R21 Analysis

- Hypothesis 1: R03 and R21 grant mechanisms lead to more complex grant (RPG) applications.
- Hypothesis 2: “Subsequent” RPGs have a higher Success Rate than their comparison group.
- Hypothesis 3: “Subsequent” RPGs produce more publications and produce higher quality publications faster than RPGs not resulting from an R03/R21.



Nomenclature

- R03/R21 = **Parent Grant**, small grant, or F_0 grant
- Subsequent Grant = **Matched Offspring**, Progeny, Child, or F_1

For the purposes of our analysis, “success” is defined as:

An R03 parent grant leading to a subsequent R21 or RPG grant

An R21 parent grant leading to a subsequent RPG grant

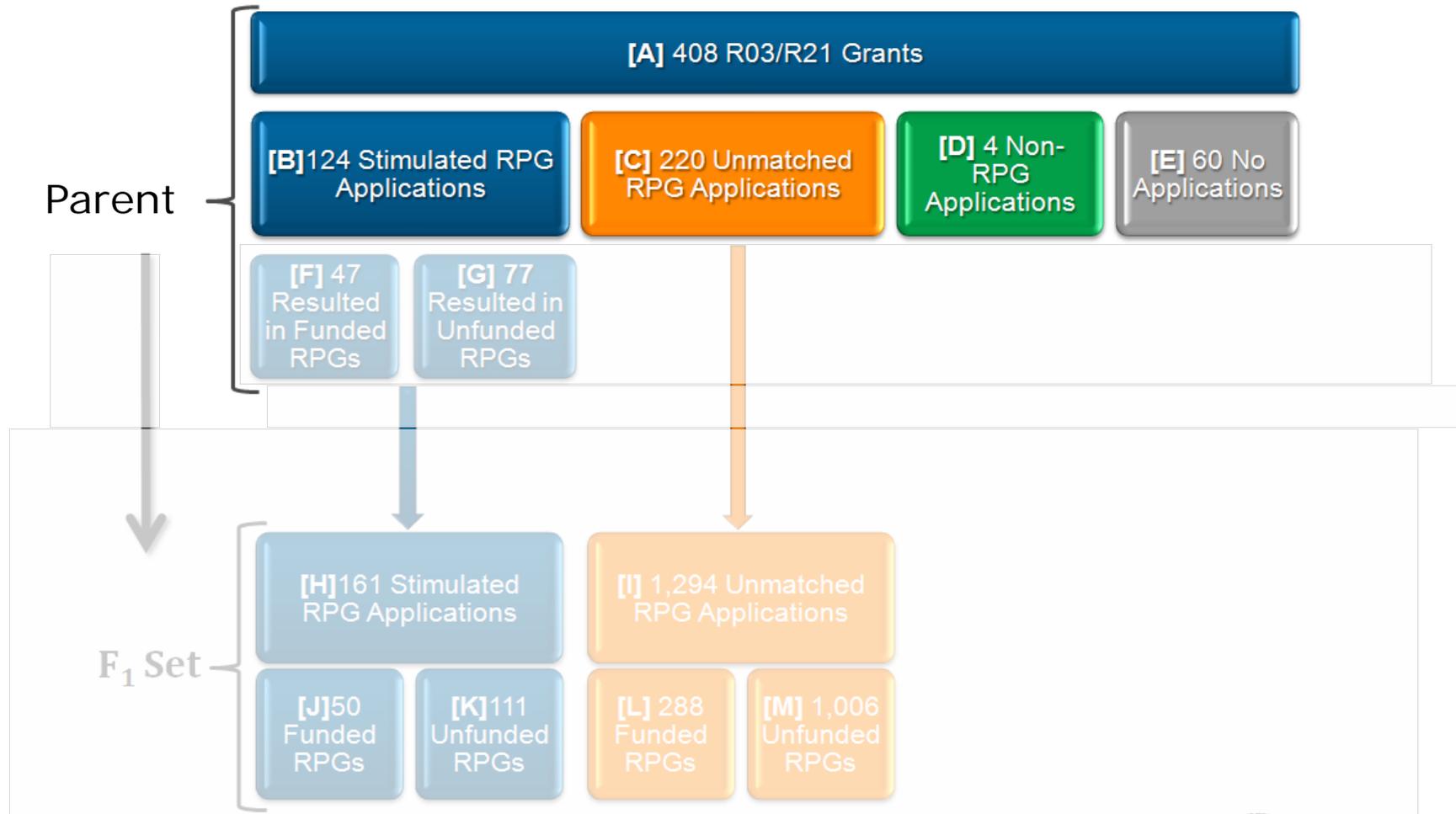


Tasks

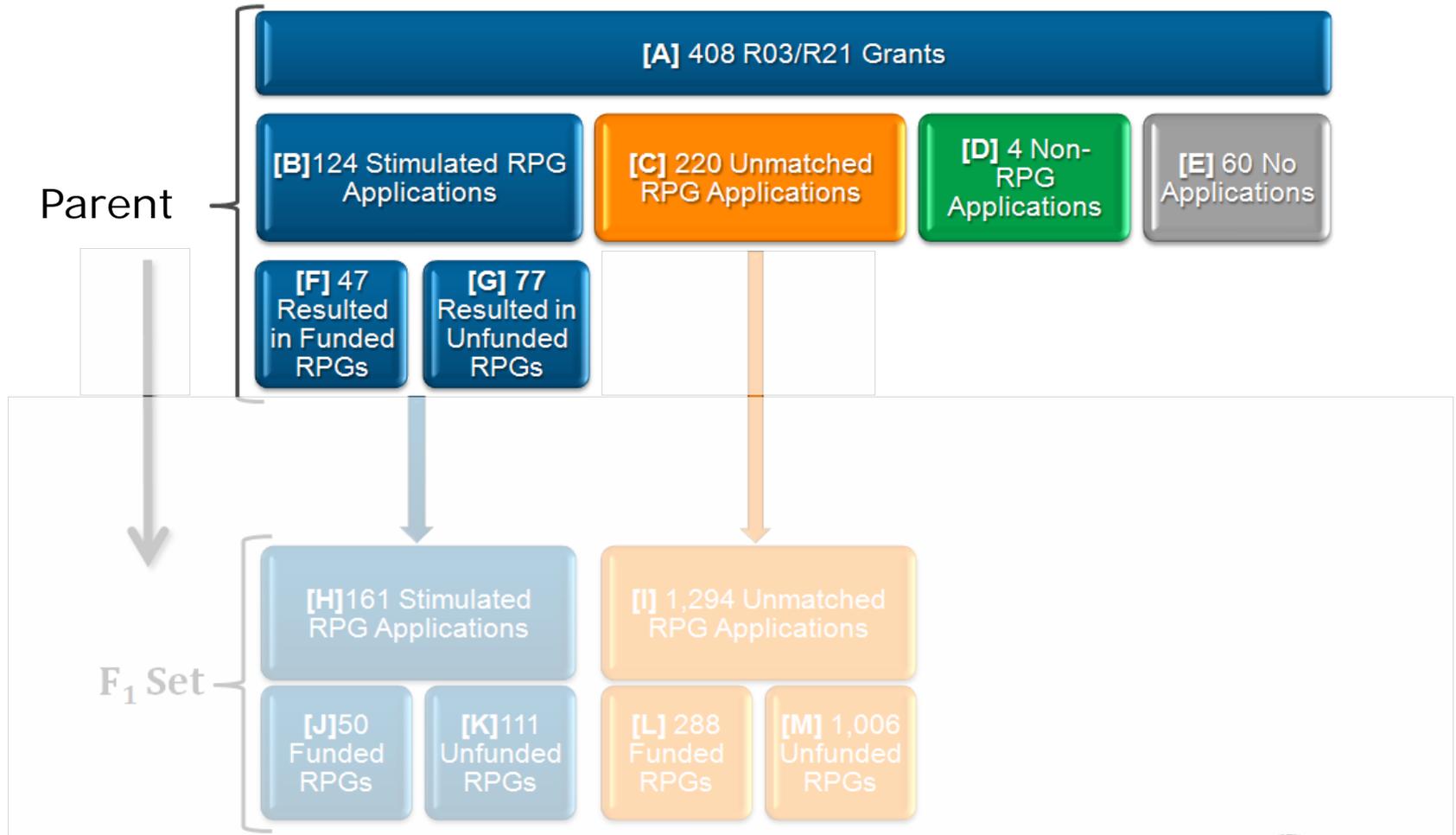
- Identify the funded ES R03/R21 grants from 1996-2008 = “small/parent grants” data set. 408 R03/R21 awarded grants from 386 Principal Investigators (PI).
- Identify “offspring” candidate set, which is the list of RPG applications submitted by the same PIs more than 12 months and less than 5 years after “parent” grants. 509 potential matches. (Discovery Logic)
- Create the final “parent – offspring” set of matched pairs of applications. 161 matched pairs from 124 “parent” grants were confirmed by Program Administrators.
- Analyze the final data set.
 - The success of the “parent” grants in developing subsequent RPG grants
 - The success rate of “offspring” and comparison groups
 - For differences between solicited and unsolicited “parent” grants
- Publication analysis to compare differences in productivity.
- Analyzed New/Early Stage Investigator status.



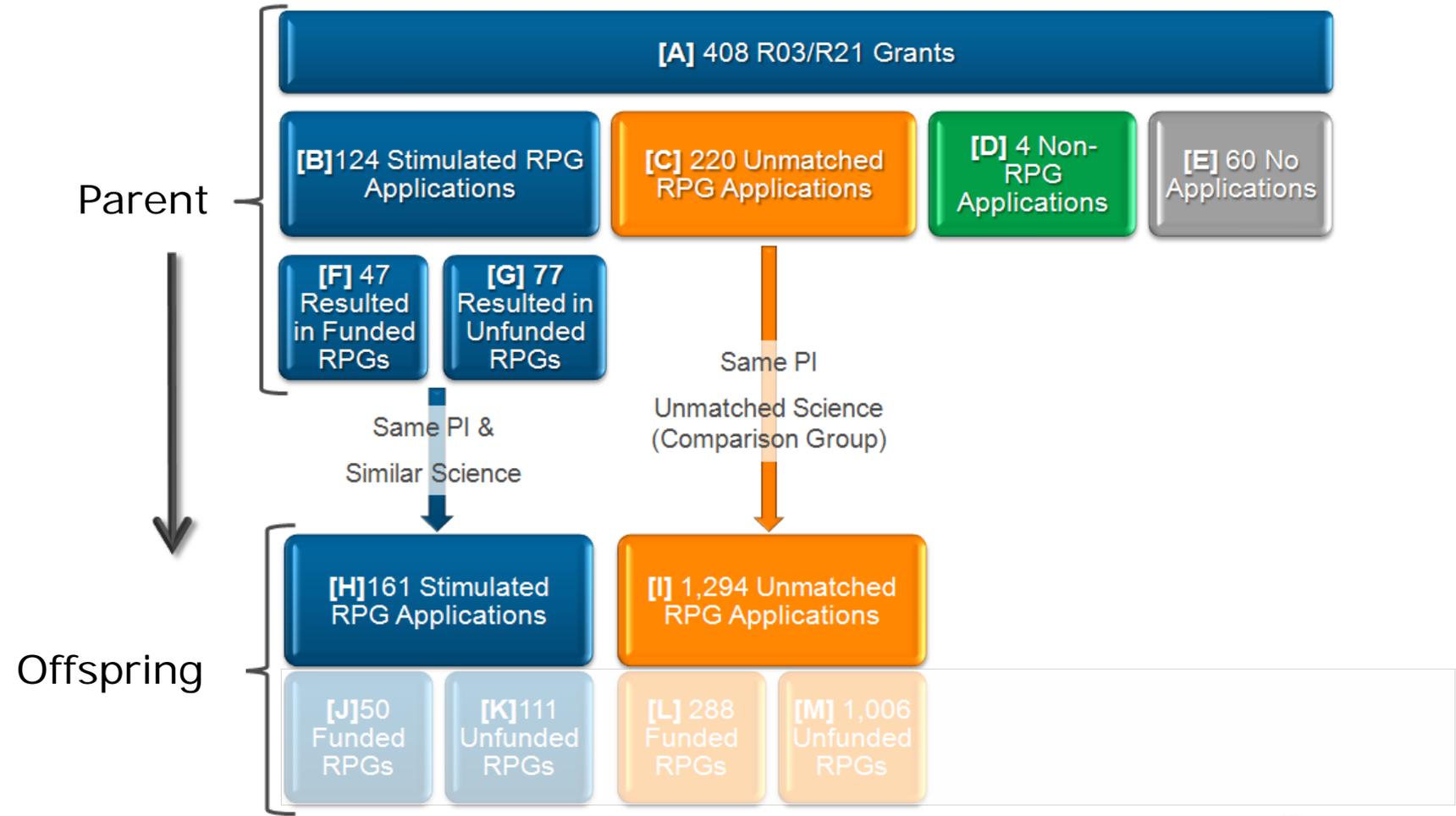
Progression of R03/R21 to Offspring Grants



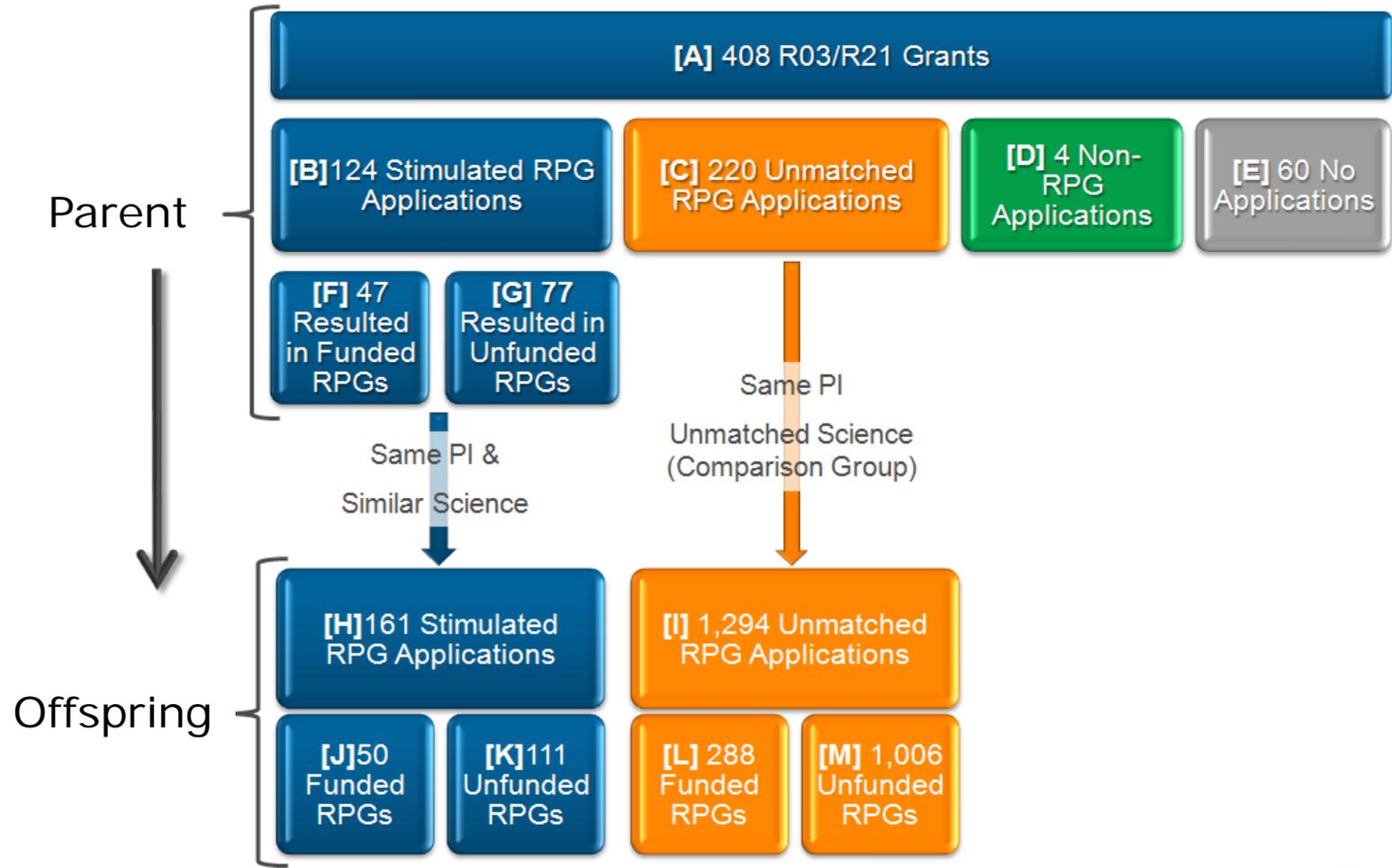
Progression of R03/R21 to Offspring Grants



Progression of R03/R21 to Offspring Grants



Progression of R03/R21 to Offspring Grants



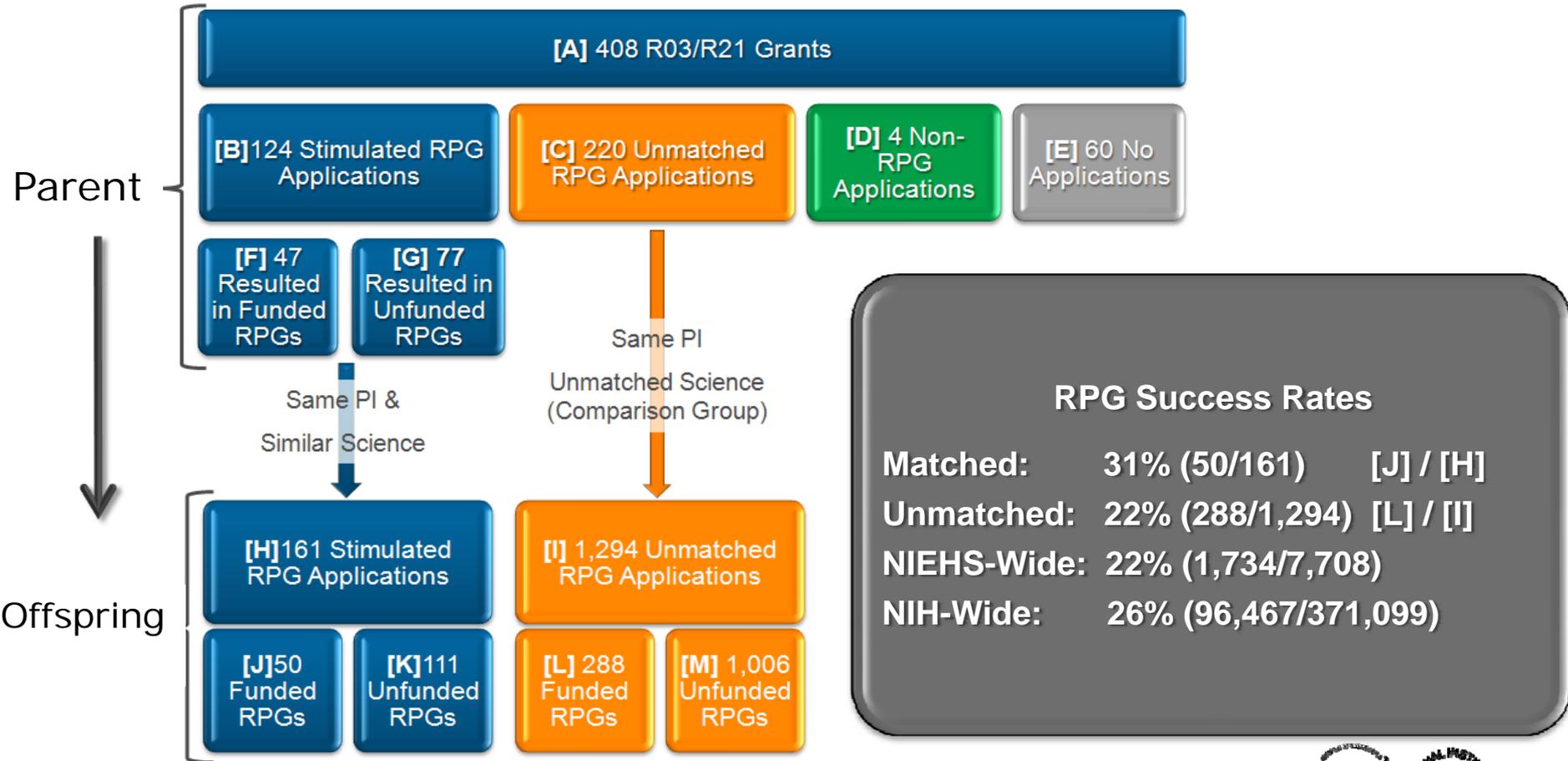
Evaluation Questions

What is the Success Rate of the “matched offspring grants”?

Is the Success Rate for the matched offspring grants better or worse than the overall NIEHS/NIH RPG success rates?



Matched Offspring Grant Applications Have a Higher Success Rate



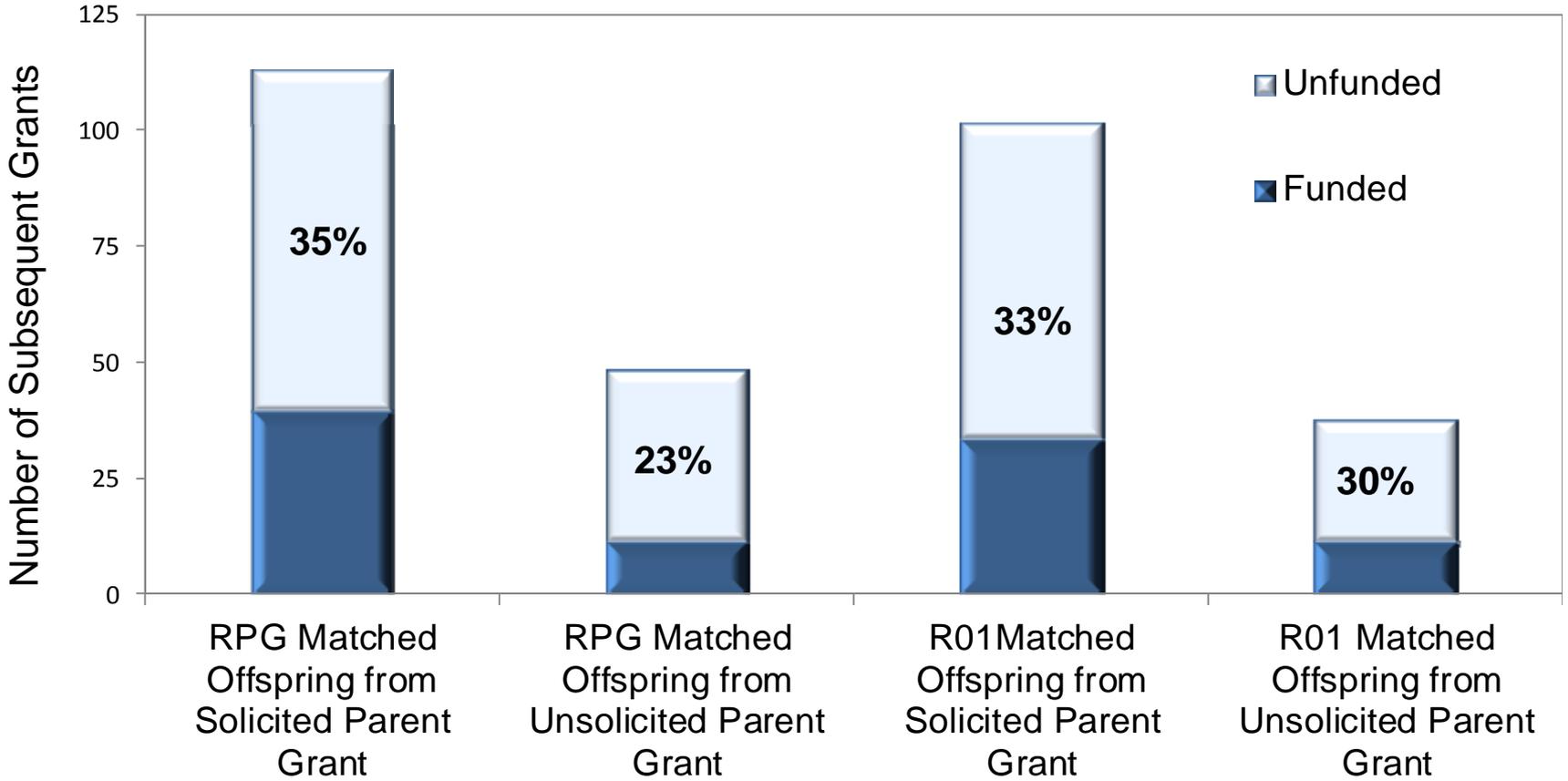
RPG Success Rates

Matched:	31% (50/161)	[J] / [H]
Unmatched:	22% (288/1,294)	[L] / [I]
NIEHS-Wide:	22% (1,734/7,708)	
NIH-Wide:	26% (96,467/371,099)	

Is there a difference in the Success Rate of Matched Offspring Grants Resulting from Solicited vs. Unsolicited R03/R21 grants?

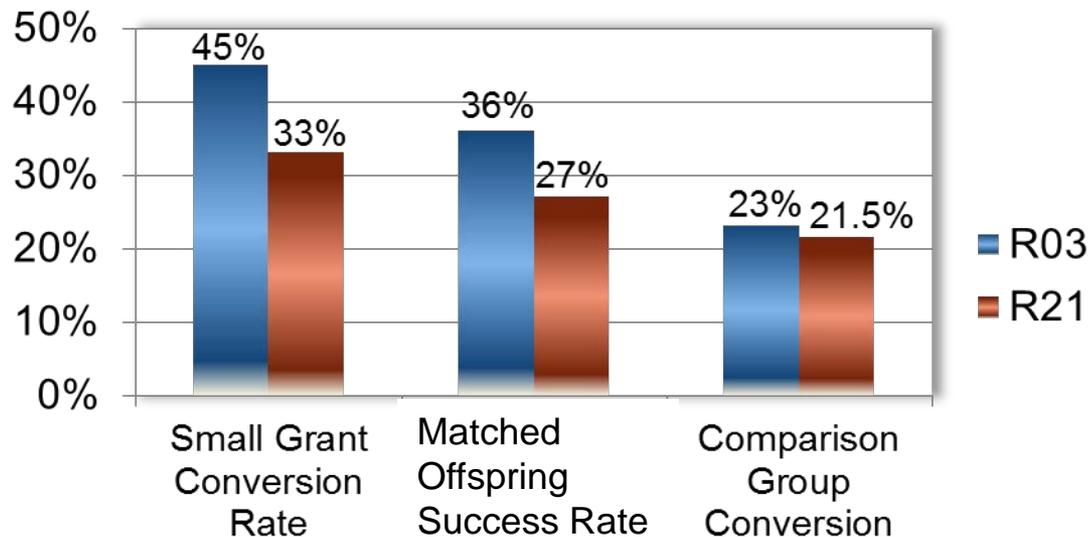


Matched Offspring Grant Applications are More Successful from Solicited R03s/R21s



Conversion Rate and Matched Offspring Success Rate for R03 vs. R21 Small Grants

The R03 offspring applications are more likely to be funded than offspring applications from an R21. However, both have higher success rates than the comparison group.



Note: From 1996 to 2008 the success rate for all RPGs at NIEHS is 22%.

Are there differences in the Bibliometric Outputs?



How Do Publication Statistics Compare?

- R03 Matched Offspring Grants: More publications per grant; more citations per grant
- R21 Matched Offspring Grants: Slightly higher impact factor

	R03		R21	
	Parent (R03)	Matched Offspring RPG Grant	Parent (R21)	Matched Offspring RPG Grant
Average Number of Publications per Grant	3.6	8.5	5.0	5.2
Average Citations per Grant	130	188	68	43
Average Citations per Paper per Grant	33	17	15	7
Average Journal Impact Factor	4.23	4.65	4.12	4.74

What is the percentage of New Investigators who use the R03-R21 mechanisms?

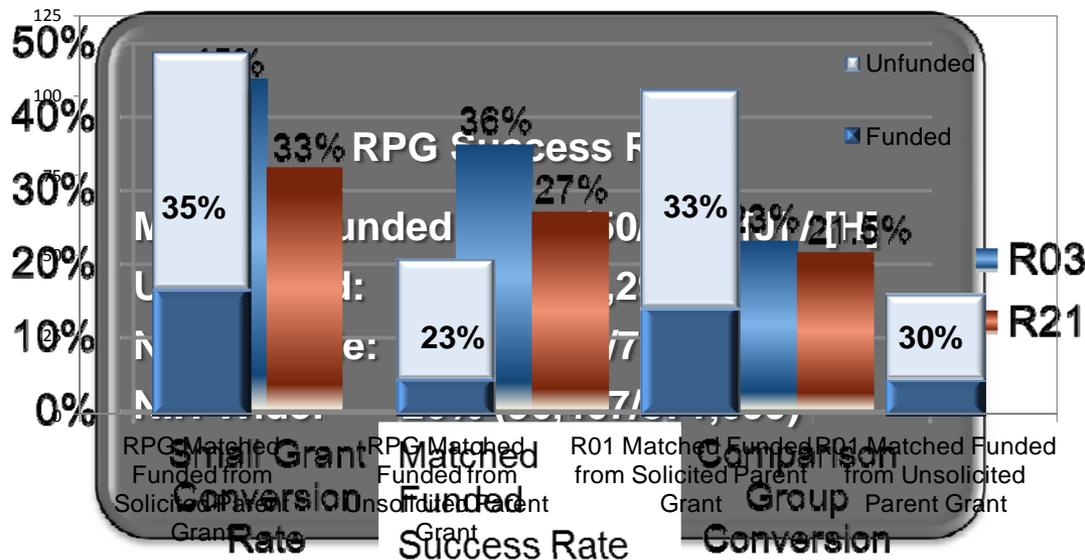


Investigator Analysis

“New” NIH Investigator?	NIH Grant AFTER the R03-R21?	New to NIEHS?	NIEHS Grant AFTER the R03-R21?
46% (179/386)	46% (83/179)	78% (300/386)	21% (62/300)

Summary

- R03/R21 grants DO STIMULATE funded offspring RPGs.
- Subsequent RPG Success Rate = 31%; Comparison Group RPG Success Rate = 22%
- R03s “converted” more successfully than R21s. (45% vs. 33%)
- Offspring RPGs from solicited small grants are more successful (35%) than unsolicited small grants (23%).



Publications results

- R03s produced fewer publications than the R21s (3.6 vs. 5) but the matched offspring grants from the R03s produced more publications and those publications were cited more frequently than the papers from the matched offspring grants from the R21s.

	R03		R21	
	Parent (R03) Grant	Matched Offspring RPG Grant	Parent (R21) Grant	Matched Offspring RPG Grant
Average Number of Publications per Grant	3.6	8.5	5.0	5.2
Average Citations per Grant	130	188	68	43
Average Citations per Paper per Grant	33	17	15	7
Average Journal Impact Factor	4.23	4.65	4.12	4.74



Conclusions

- R03 and R21 grants are effective at stimulating more complex Research Project Grant applications and awards.
- Productivity of small grants, measured by publications, is impressive especially considering the small level of funding and the short amount of time for which they are funded.
- Given that we found RPGs resulting from previously funded R03 or R21 grants have a higher success rate (31%) than those without a previous small grant history (22%), we recommend that NIEHS continues its investment in small grant mechanisms.



Acknowledgements

Colleagues at NIEHS

Jerry Phelps

Linh Pham

Helena Davis

Christie Drew

Colleagues at Discovery Logic

Joshua Schnell

Duane Williams

DETR Evaluation Committee and special thanks to

Pat Mastin

Cindy Lawler

Program Administrators who reviewed the matched pairs

eSPA Working Group

