

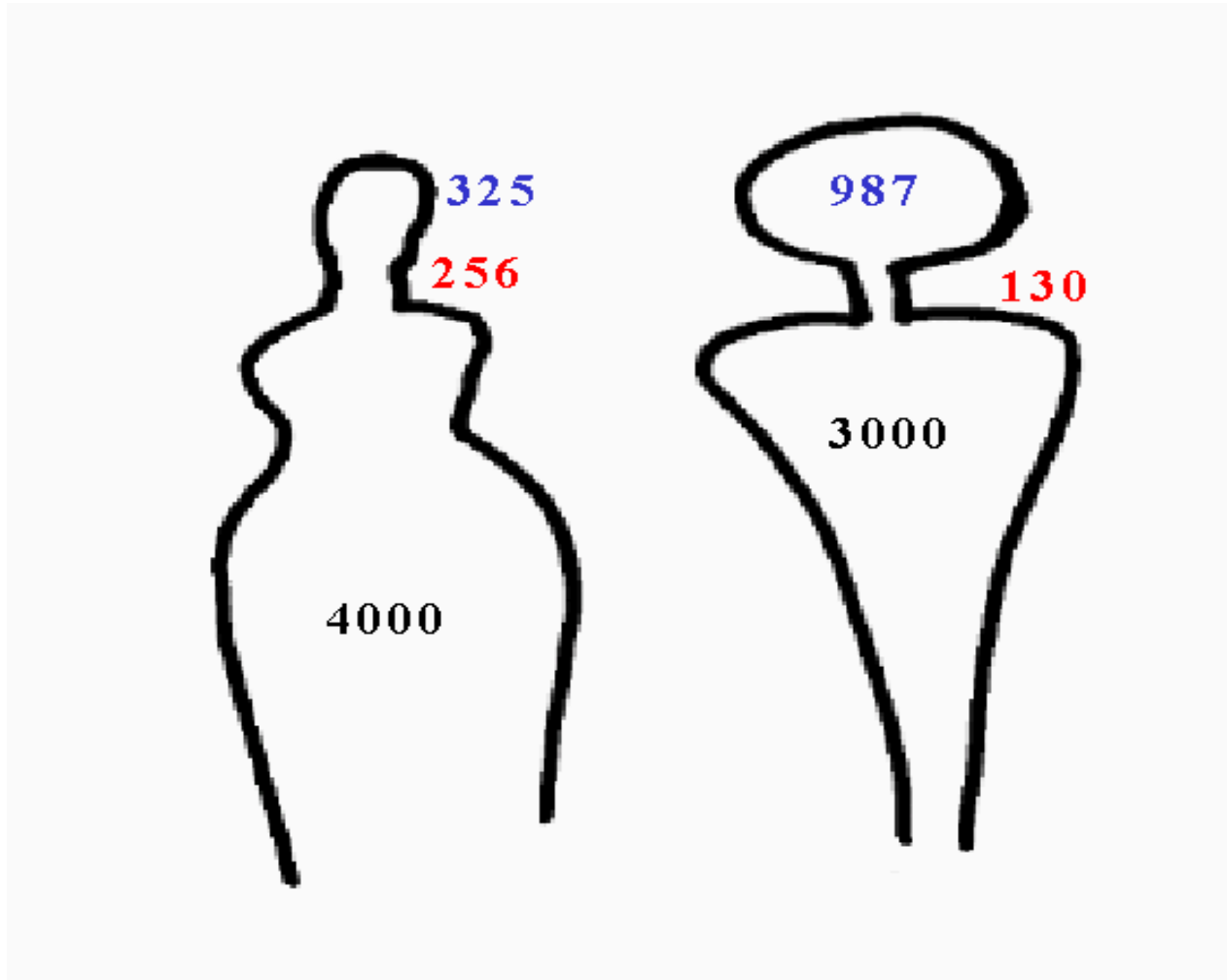
DO BABIES MATTER IN SCIENCE?

Mary Ann Mason

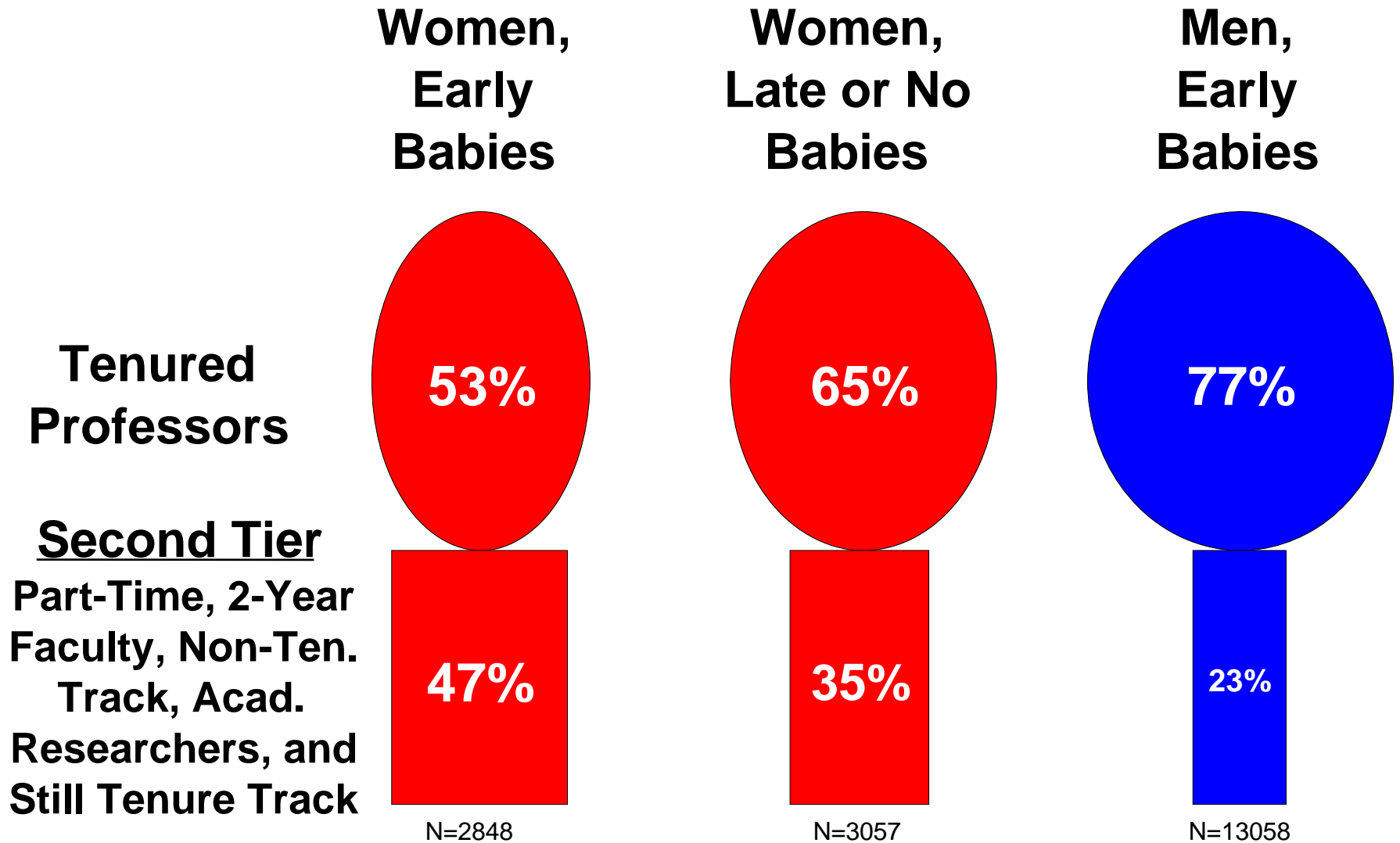
University of California, Berkeley

University of California, Berkeley

(2002)



Heads and Necks of Science PhD Recipients*



*PhDs from 1978-1984 Who Are Working in Academia 12 to 14 Years Out from PhD

Source: Survey of Doctorate Recipients. Sciences, 1979-1999.

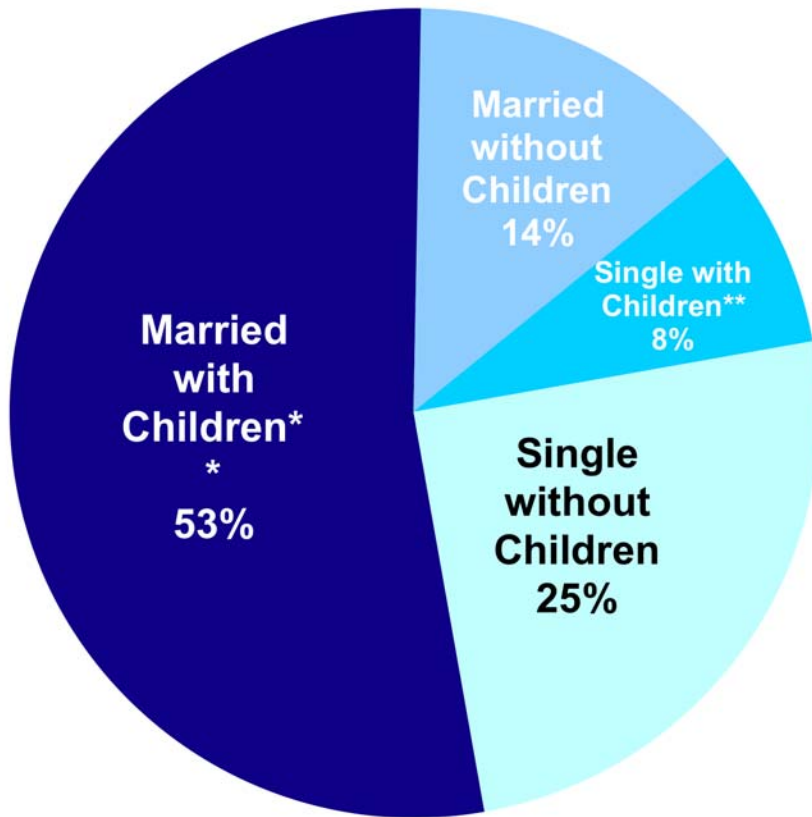
Note: The use of NSF Data does not imply the endorsement of research methods or conclusions contained in this report.

Major Findings: Family → Career

- Overall, **men** with “early babies” are 38% more likely than **women** with “early babies” to achieve tenure.
- **Women** with “early babies” leave academia before obtaining their first tenure track job.
- Single **mothers** are more successful than married mothers.
- **Women** with “late babies” do as well as women without children.
- Having no babies at all is the dominant success mode for **women**.
- **Men** who have “early babies” do very well. In fact, they do better than all others, including single **men** and **women**.
- A high percentage of **mothers** slide into the second tier, the part-time, adjunct and lecturer corps: the “gypsy scholars” of the university world.
- Many **women** change their career course in graduate school or as postdocs because of family concerns.

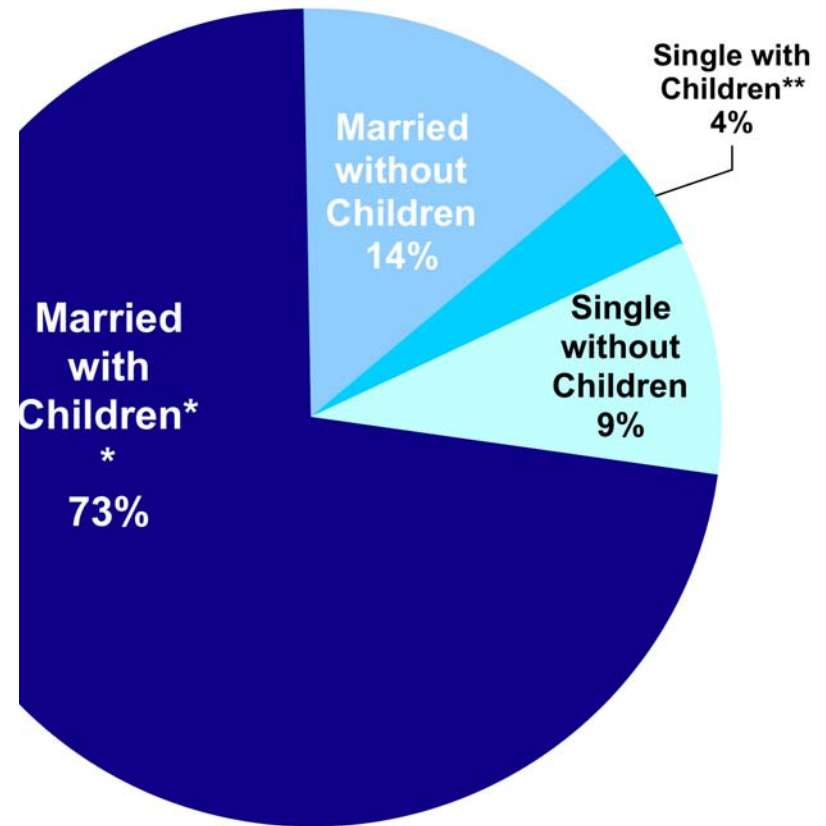
Family Status of Tenured Faculty in the Sciences*

Women



N=3109

Men



N=19,074

*PhDs from 1978-1984 Who Are Tenured 12 Years out from PhD in **STEM & Bio. Sciences.**

**Had a child in the household at any point post PhD to 12 years out.

Source: Survey of Doctorate Recipients. Sciences, 1979-1999.

Note: The use of NSF Data does not imply the endorsement of research methods or conclusions contained in this report.

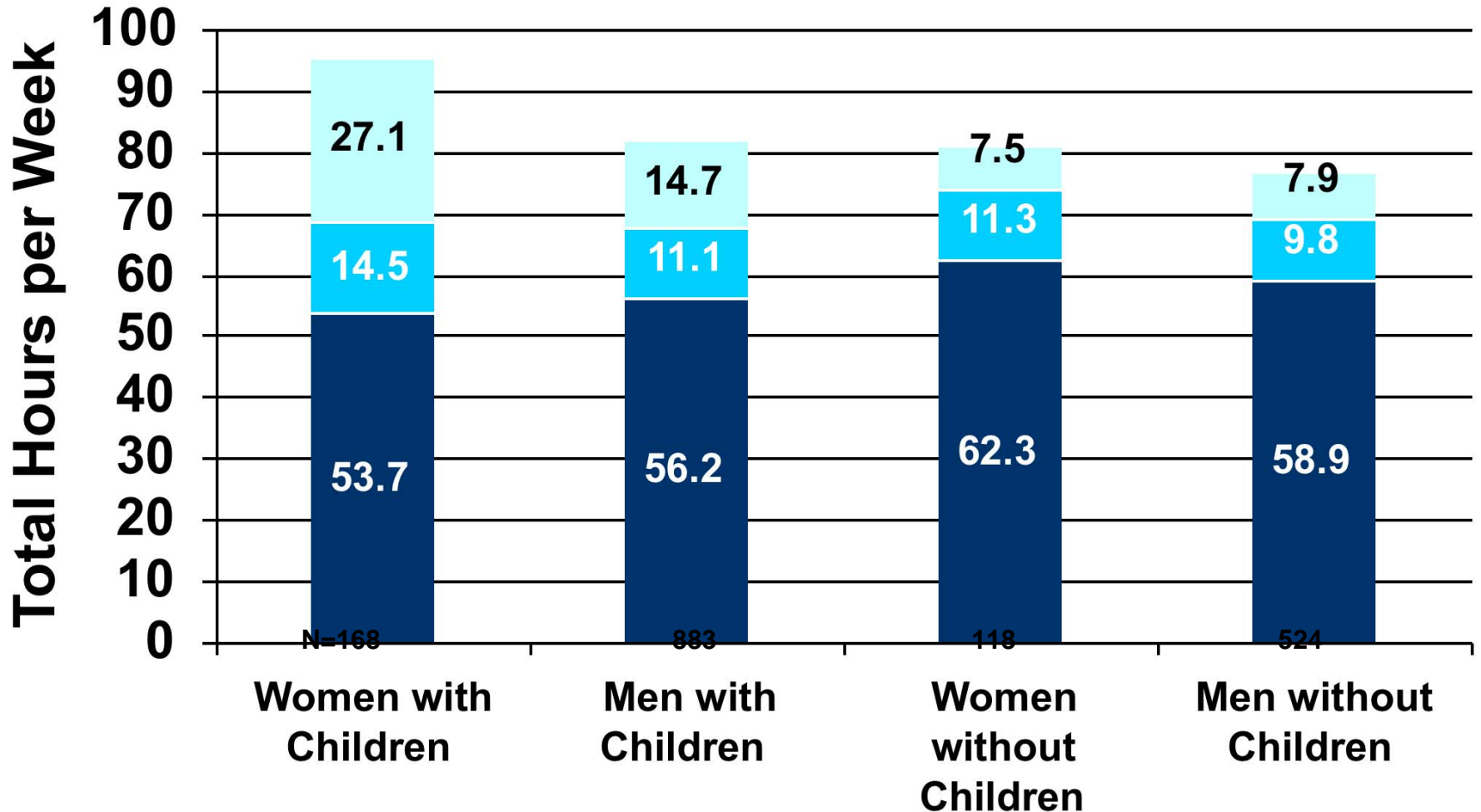
Major Findings: Career → Family

- Only one in three **women** without children who takes a fast-track university job ever become mothers.
- **Women** who achieve tenure are far more likely than **men** who achieve tenure to be single 12 years out from the PhD — more than twice as likely.
- If married, **women** are significantly more likely than **men** to experience divorce or separation.
- **Women** faculty were more than twice as likely as **men** faculty to indicate they wished they could have had more children — a full 38% of **women** said so in comparison to 18% of **men**.

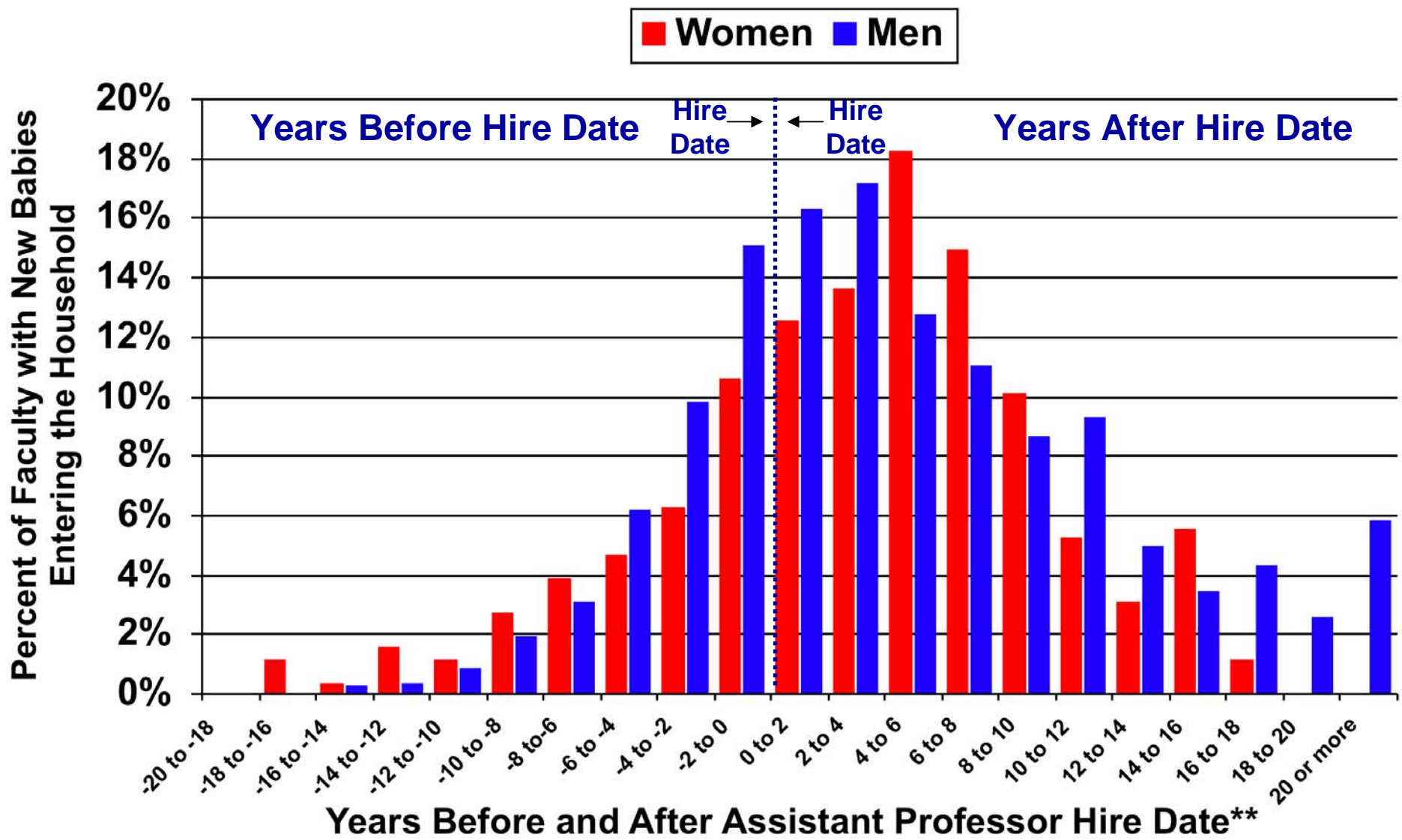
Everybody is Very Busy

(UC Faculty in the Sciences)

■ Professional ■ Housework ■ Caregiving



The Baby Lag for UC Women Faculty in Pursuit of Tenure in the Sciences*



N=1164 Men
265 Women

**Year 0 represents Assistant Professor Hire Date

*Includes STEM & Bio. Science.

Source: Mason, Mary Ann, Angelica Stacy, and Marc Goulden. 2003. "The UC Faculty Work and Family Survey." (<http://ucfamilyedge.berkeley.edu>).

New Family Friendly Initiatives for UC Berkeley Ladder-Rank Faculty

- **Active Service-Modified Duties (ASMD)** — Provides teaching relief for parents with “substantial” caregiving responsibilities for a newborn or new adoptee: two semesters/quarters for birth mothers. Funded centrally to defray the cost to departments. *An entitlement.*
- **Tenure-Clock Stoppage** — Adds one year extension to the tenure clock for tenure-track faculty parents with “substantial” caregiving responsibilities for a newborn or new adoptee (one year per birth/adoption event, with a two-year cap). *An entitlement.*
- **Flexible Part-time Option** — To allow tenure-track faculty, pre- and post-tenure, to go from full- to part-time as life needs arise (i.e. caregiving responsibilities). Would encourage departments to take into account part-time status in advancement decisions. *Under review.*
- **School for Chairs** — Promotes the use of family friendly policies, resources and benefits. *Soon to be launched.*

Graduate Student Parent Resources at UC Berkeley

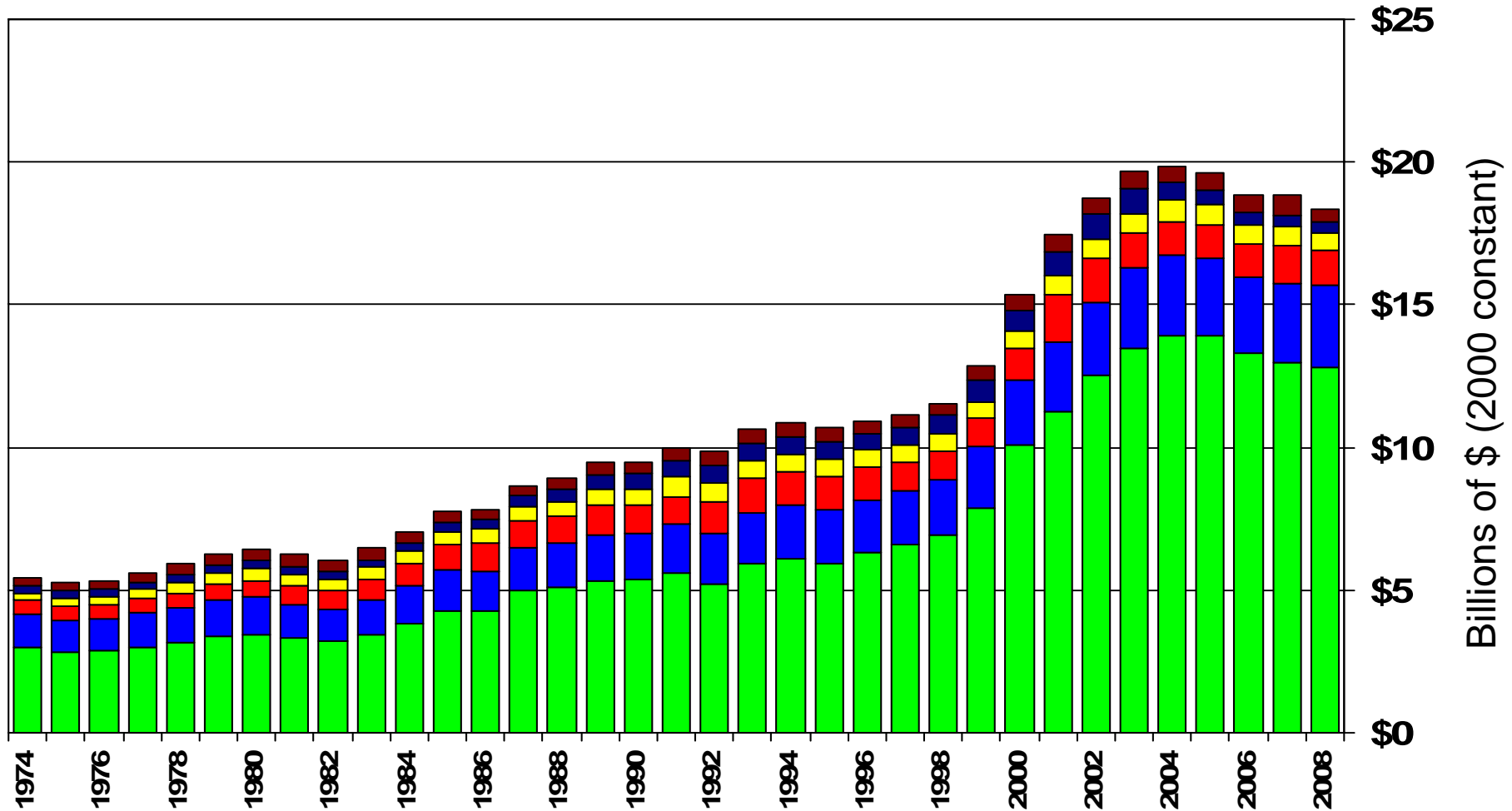
New Initiatives

- Paid Childbirth Leave (approved February 2007)
- Expanded infant/toddler/preschool slots in a new Child Development Center (opened January 2007)
- UC Families: an online newsletter and resource for students, staff, and faculty at all UC campuses who seek to balance academic goals or careers with family life. See <http://parents.berkeley.edu/ucfamilies>
- ‘Stopping the Clock’: Extensions to academic milestones (preliminary exams, qualifying exams, Normative Time completion)

Continuing Initiatives

- **Family Student Housing** (two large complexes)
- **Children’s Center & Family Resource Center** (located in Family Housing)
- **Student Parent Center** (located in Student Center)
- **Breastfeeding Support Program** (Student Health Center & campus locations)
- **Graduate Student Parent Grant** (funded by Graduate Division, administered by Financial Aid Office)

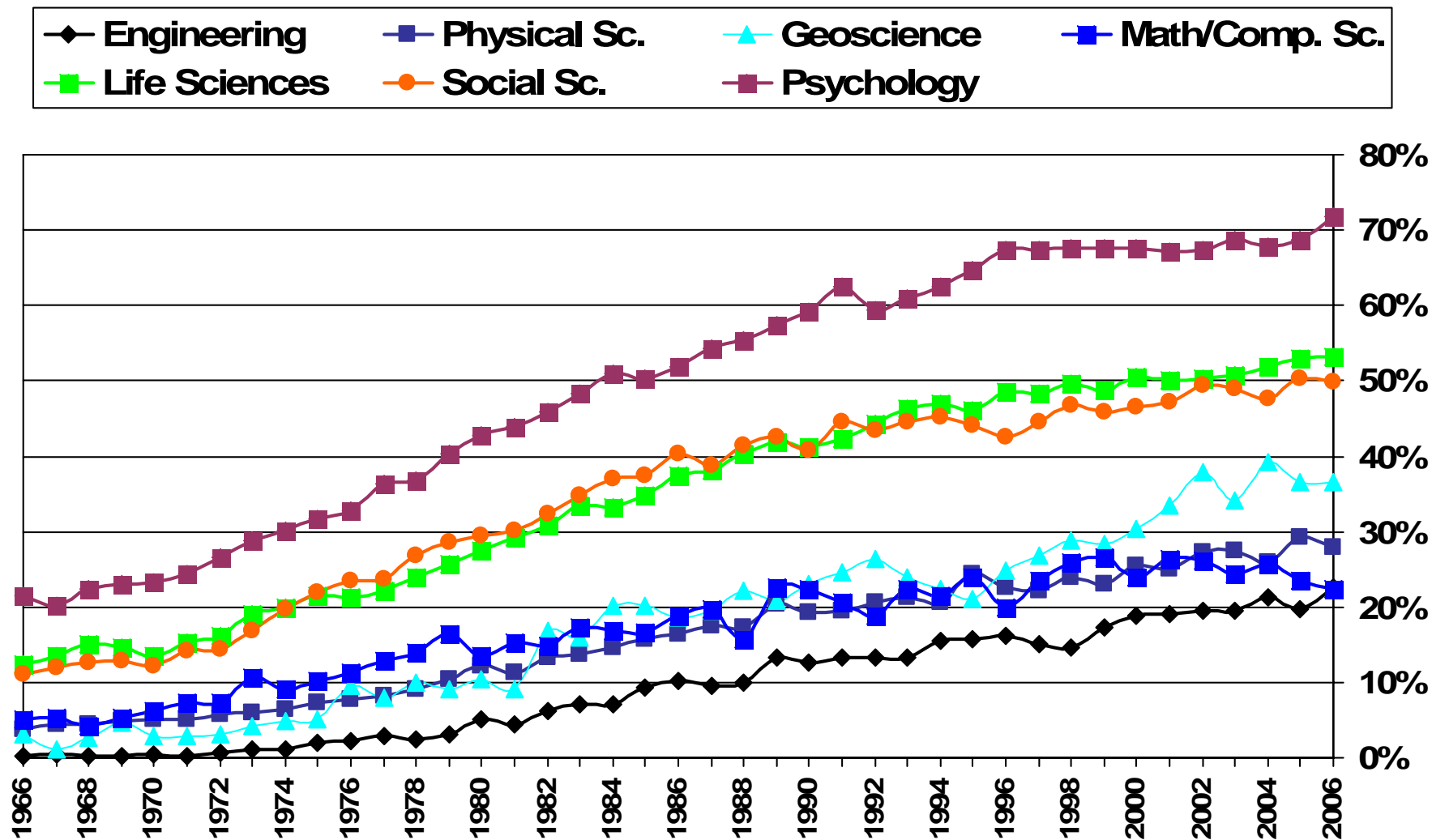
Figure 1: Basic & Applied Research Funds Awarded by U.S. Federal Agencies to Universities and Colleges (2000 constant \$*)



Source: NSF Survey of Federal Funds for Research and Development, 1974-2008. Retrieved from Webcapar, 4/20/2009.

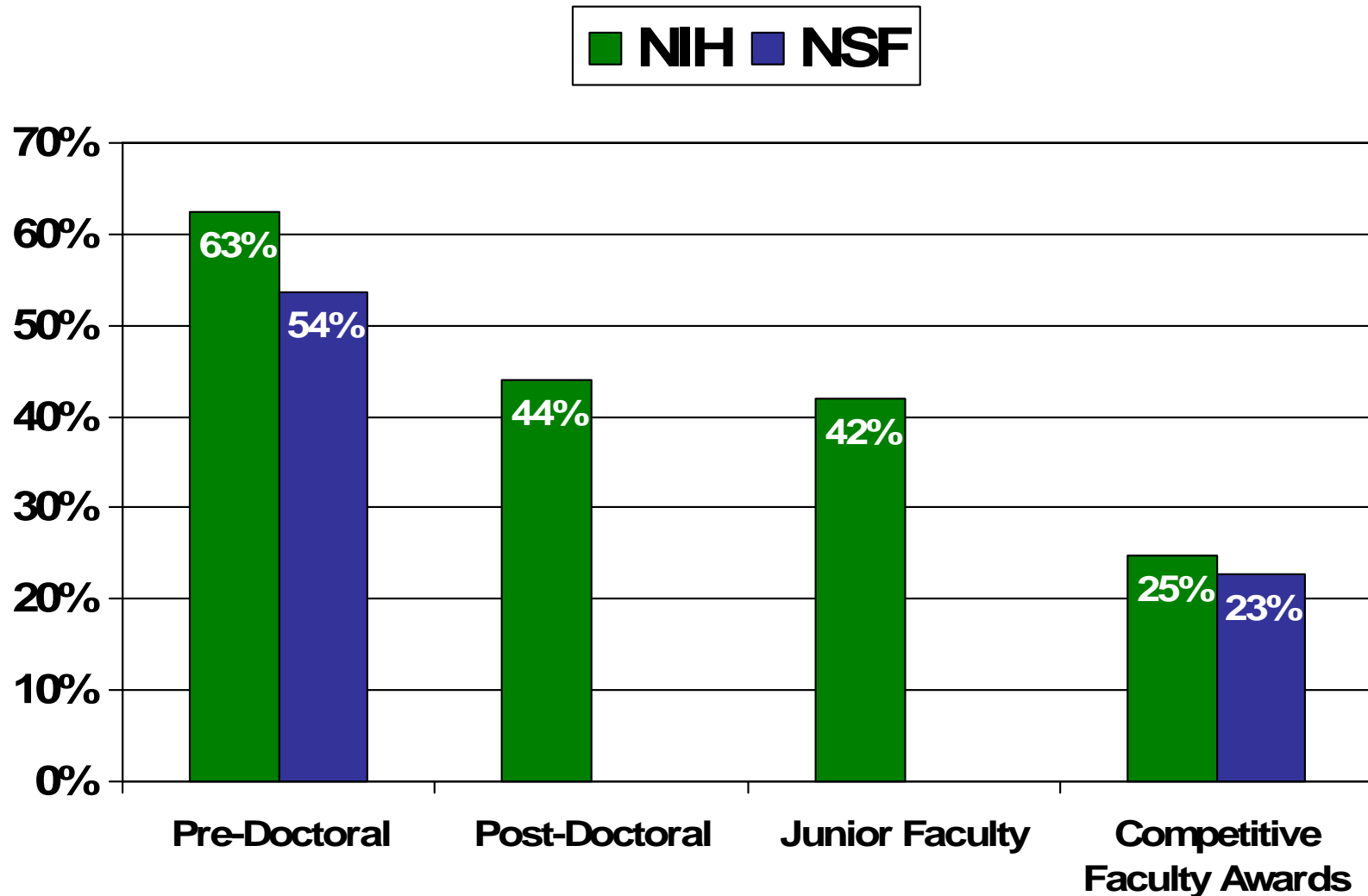
*Fiscal Year GDP Implicit Price Deflators (2000 base year), as of March 2008.

Figure 2: Women as a Percent of Doctoral Recipients in the United States (*U.S. Citizens Only*), Sciences, 1966-2006



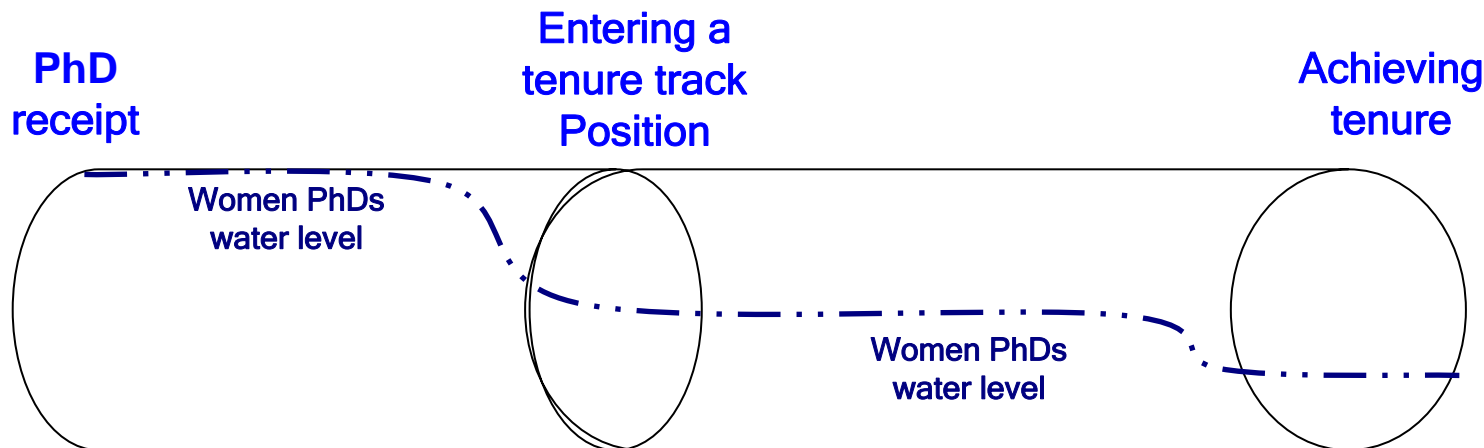
Source: National Science Foundation (NSF), Survey of Earned Doctorates, retrieved from WebCaspar, 4/15/2009.

Figure 3: Problems in the Pipeline: Women as a Percent of NIH and NSF Awards*, by Level of Award (2007)



Source: NIH and NSF Accountability Reports, 2008.

Figure 4: Leaks in the Pipeline to Tenure for Women PhDs in the Sciences*



Married women with young children

- 39% lower odds than married men with young children to get a tenure-track position
- 26% lower than married women without young children
- 32% lower than single women without young children
- 37% lower than single women with young children

Married women without young children

- 10% lower odds than married men without young children to get a tenure-track position
- 8% lower than single women without young children

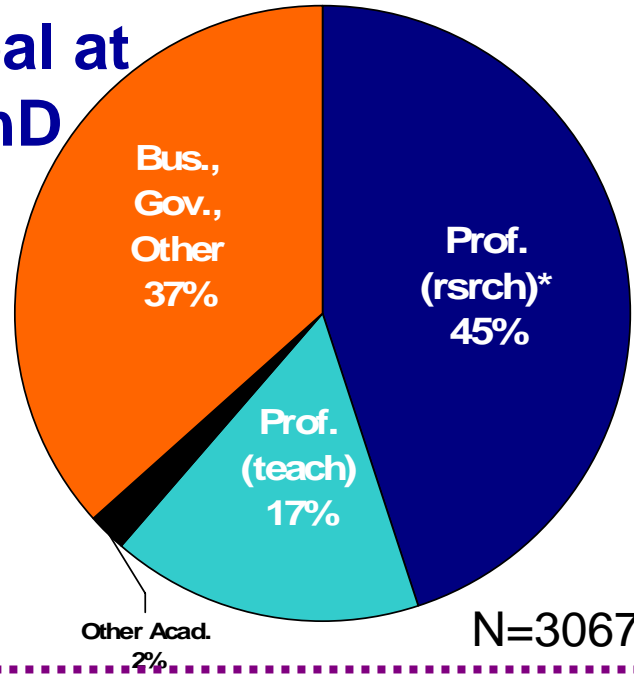
Married women with young children

- 29% lower odds than married men with young children to become tenured
- 19% lower than married women without young children
- 10% lower than single women without young children
- 34% lower than single women with young children

*Results are based on Survival Analysis of the *Survey of Doctorate Recipients* (a national biennial longitudinal data set funded by the National Science Foundation and others, 1979 to 1999) in **All Sciences, including Social Sciences**. The analysis takes into account disciplinary, age, ethnicity, PhD calendar year, time-to-PhD degree, and National Research Council academic reputation rankings of PhD program effects. For each event (PhD to TT job procurement, or TT job to Tenure), data is limited to a maximum of 16 years. The waterline is an artistic rendering of the statistical effects of family and gender. Note: The use of NSF Data does not imply the endorsement of research methods or conclusions contained in this report.

Career Goal at Start of PhD

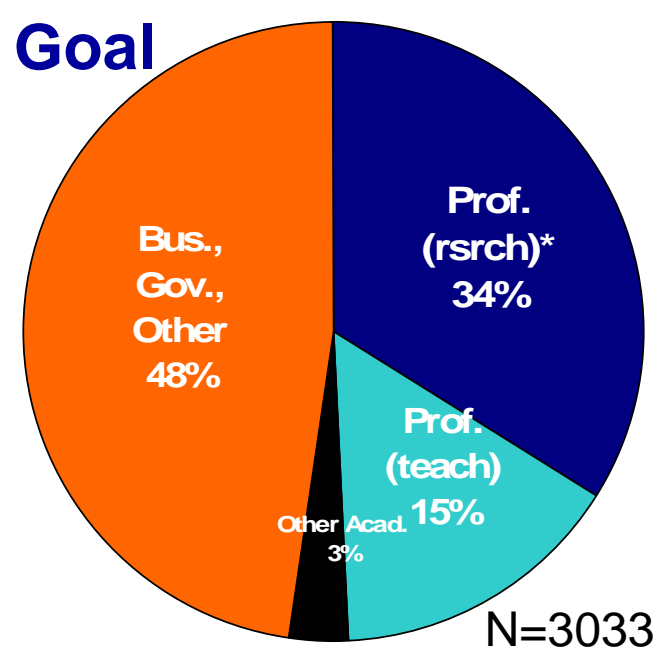
Men



**Professor w. Research Emphasis*

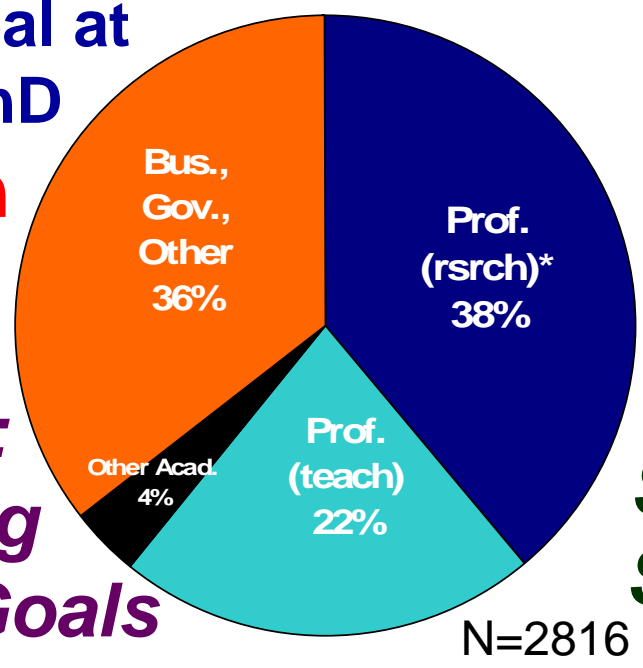
Current Goal

Men



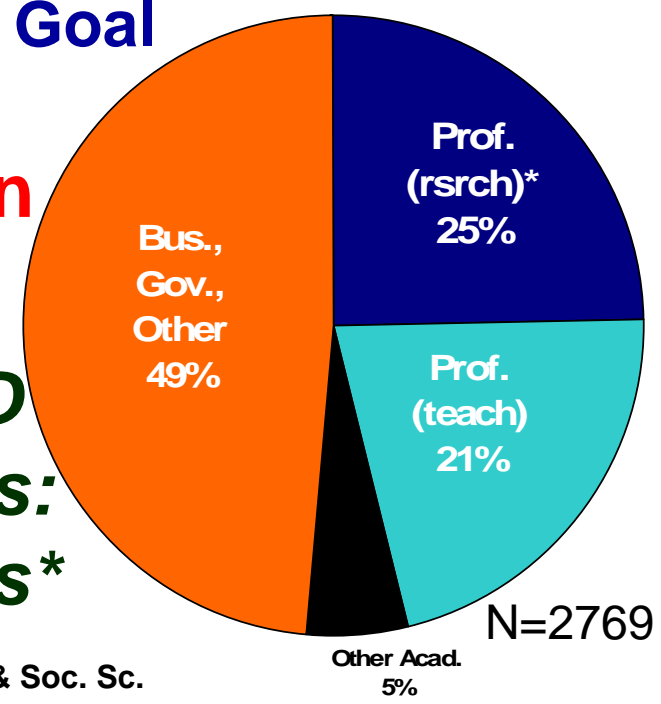
Career Goal at Start of PhD

Women



Current Goal

Women



UC PhD Students: Sciences*

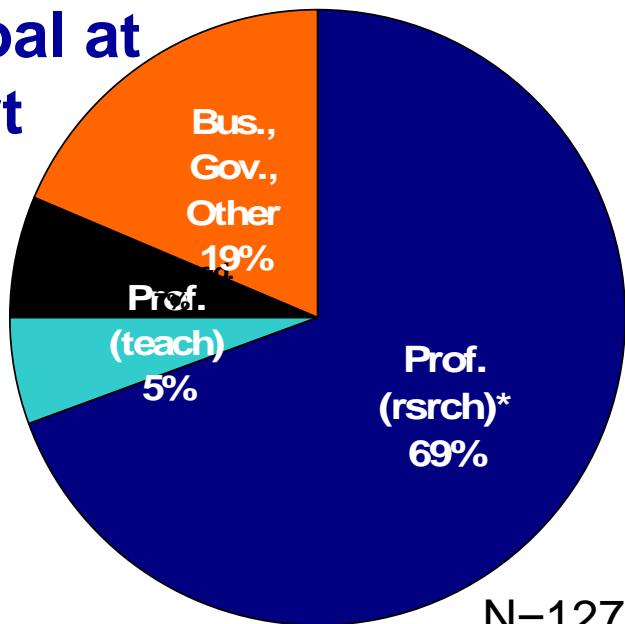
*Phys., Bio., & Soc. Sc.

Figure 5: Changing Career Goals

Source: Mason, Mary Ann and Marc Goulden. 2006. "UC Doctoral Student Career Life Survey." (<http://ucfamilyedge.berkeley.edu/grad%20life%20survey.html>).

Career Goal at Pdoc Start

Men

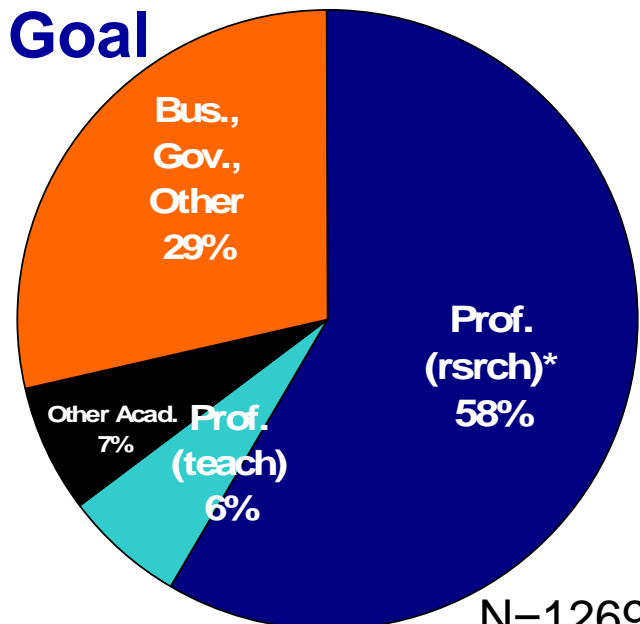


**Professor w. Research Emphasis*

N=1271

Current Goal

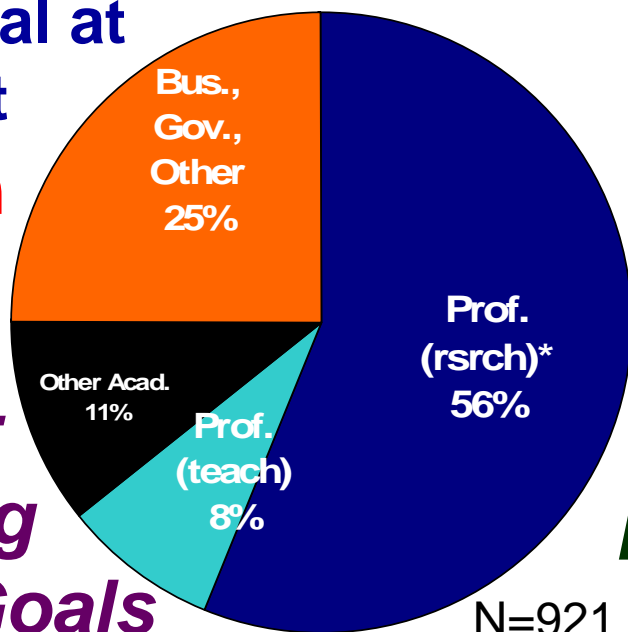
Men



N=1269

Career Goal at Pdoc Start

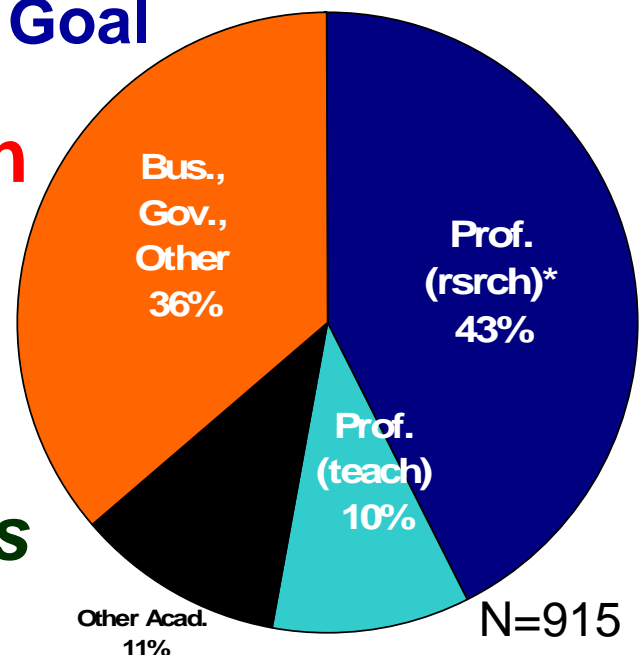
Women



N=921

Current Goal

Women



N=915

Figure 6:
Changing Career Goals

UC Postdocs

Figure 7: Reasons Most Commonly Cited by UC PhD Students in the Sciences* for *Shifting Career Goal away from Professor with Research Emphasis*

% Citing Factor As “Very Important**” in Career Goal Shift		Total	Men	Women
1	Negative experience as PhD student	44%	44%	45%
2	Other life interests	42%	35%	48%
3	Professional activ. too time consuming	41%	35%	47%
4	Issues related to children	34%	20%	44%
5	Geographic location Issues	33%	27%	37%
6	Feelings of isolat./alienation as PhD stud.	31%	30%	31%
7	Career advancement issues	30%	33%	27%
8	Job security	28%	28%	28%
9	Bad job market	27%	27%	27%
10	Monetary compensation (e.g. salary, ben.)	26%	31%	22%
11	Spouse/partner issues or desire to marry	26%	21%	29%
12	Other career interests	24%	22%	26%

*Phys., Bio., & Soc. Sc. **Not applicable is excluded from analysis. N=797 to 1006 358 to 475 435 to 526

Yellow shading indicates the group's response is significantly higher than the other group's response (P<.01).

**Reasons Most Commonly Cited by UC Postdoctoral Scholars for
Shifting Career Goal away from Professor with Research Emphasis**

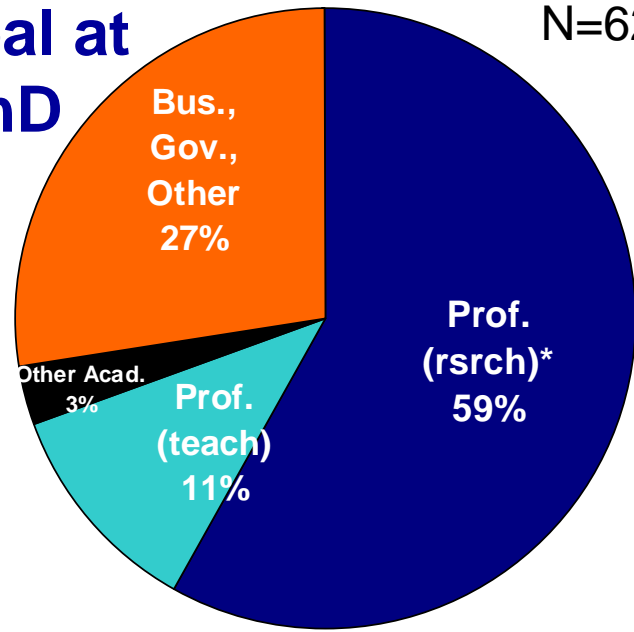
% Citing Factor As “Very Important*” in Goal Shift		Total	Men	Women
1	Career advancement issues	49%	56%	42%
2	Bad job market	47%	50%	43%
3	Job security	46%	50%	42%
4	Monetary compensation (e.g. salary, ben.)	46%	54%	37%
5	Issues related to children	42%	34%	52%
6	Geographic location Issues	40%	44%	37%
7	Professional activ. too time consuming	36%	31%	42%
8	Other life interests	32%	29%	35%
9	Spouse/partner issues or desire to marry	32%	33%	31%
10	Negative experience as a postdoc	28%	30%	27%
11	Other familial-related concerns	26%	26%	26%
12	Feel. of isolation/alienat. as posdoc	25%	19%	33%
13	Good job market (elsewhere)	25%	27%	22%
14	Lack of encouragem./lack of mentor	24%	15%	33%

*Not applicable is excluded from analysis. N=186 to 247 101 to 126 85 to 120

Yellow shading indicates the group’s response is significantly higher than the other group’s response (P<.05).

Career Goal at Start of PhD

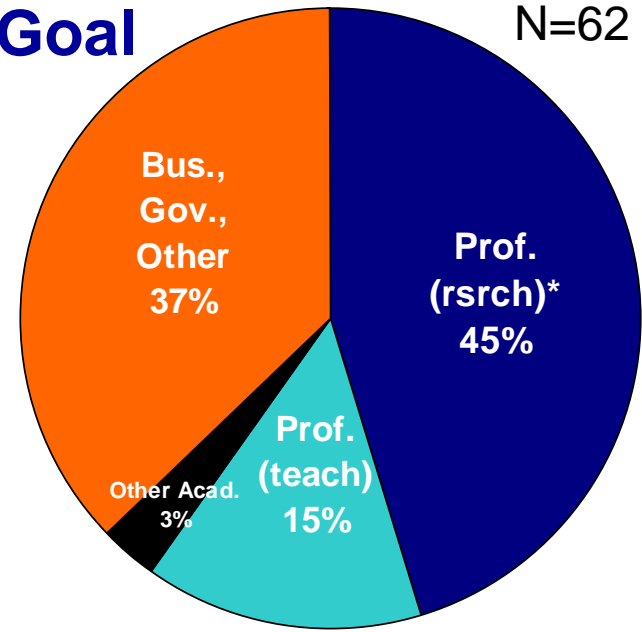
Men



N=62

Current Goal

Men

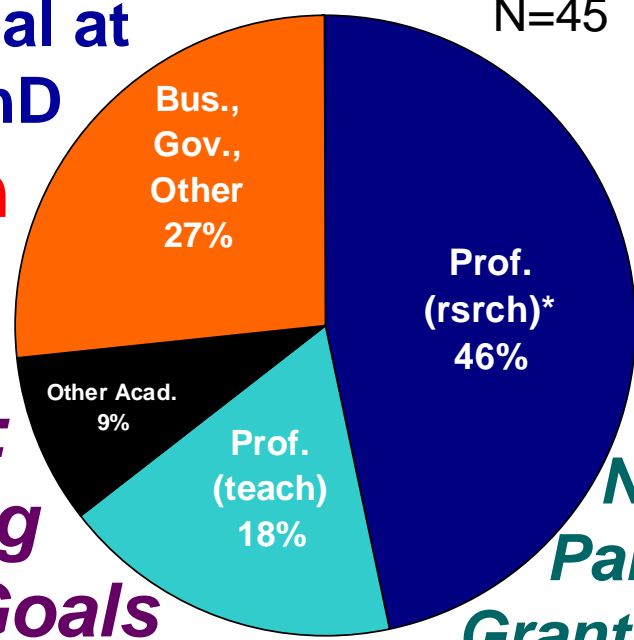


N=62

**Professor w. Research Emphasis*

Career Goal at Start of PhD

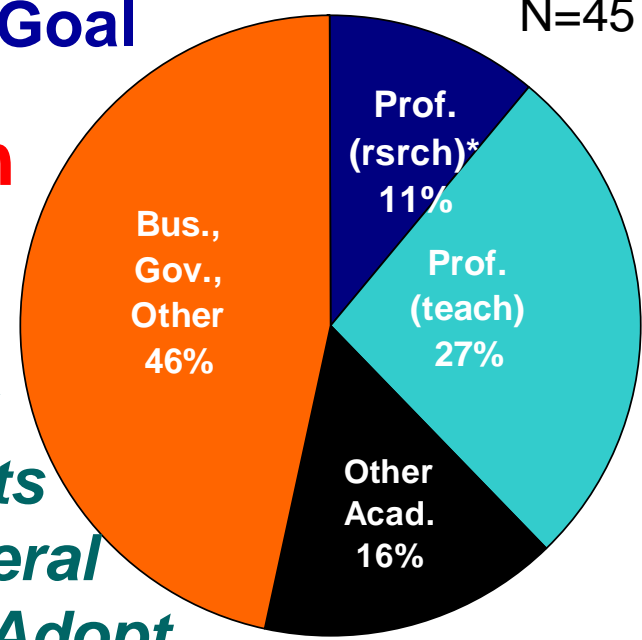
Women



N=45

Current Goal

Women



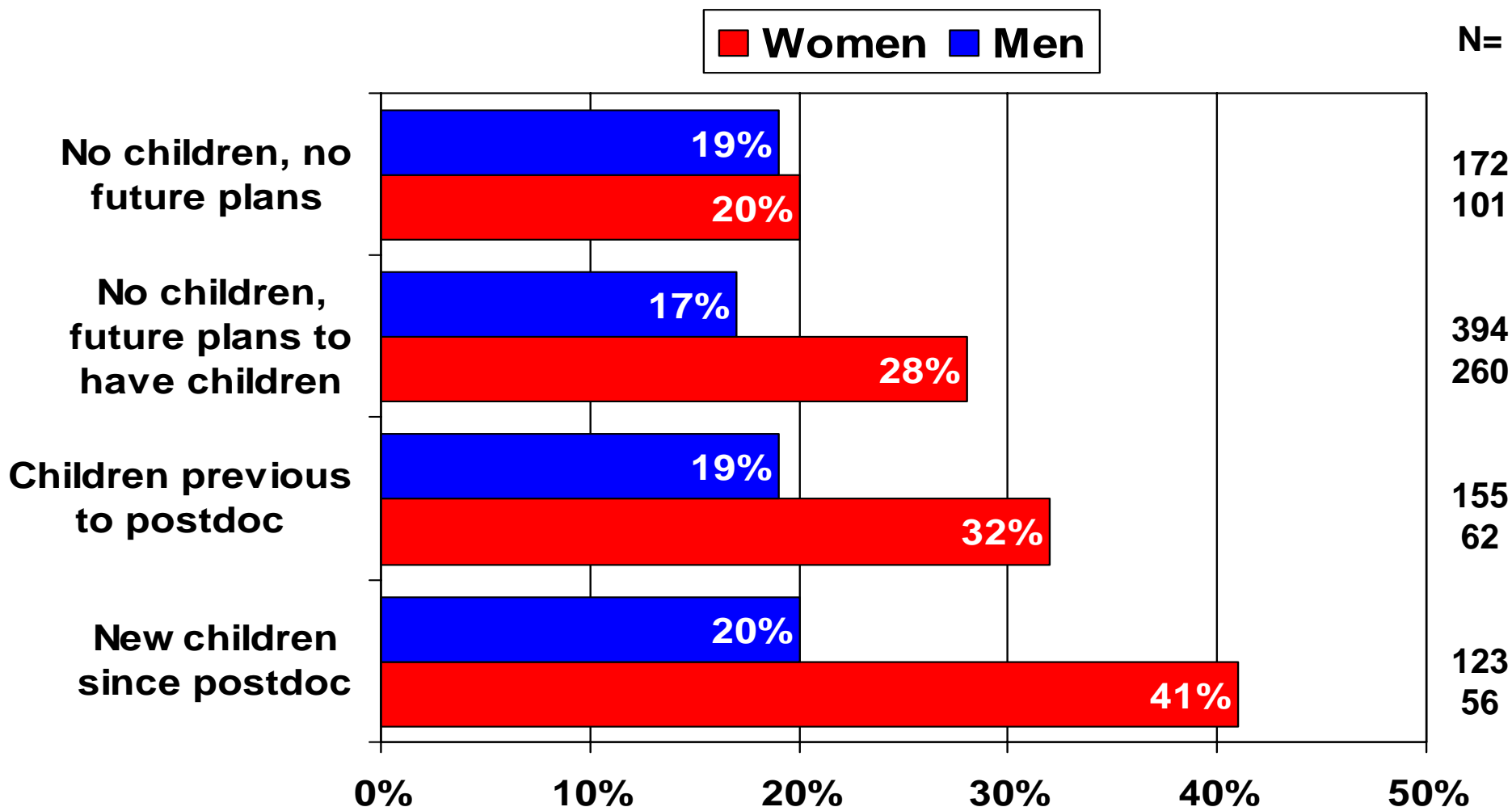
N=45

Figure 9: Changing Career Goals

*UC PhD Students:
New Parents
Paid Off Federal
Grants at Birth/Adopt.*

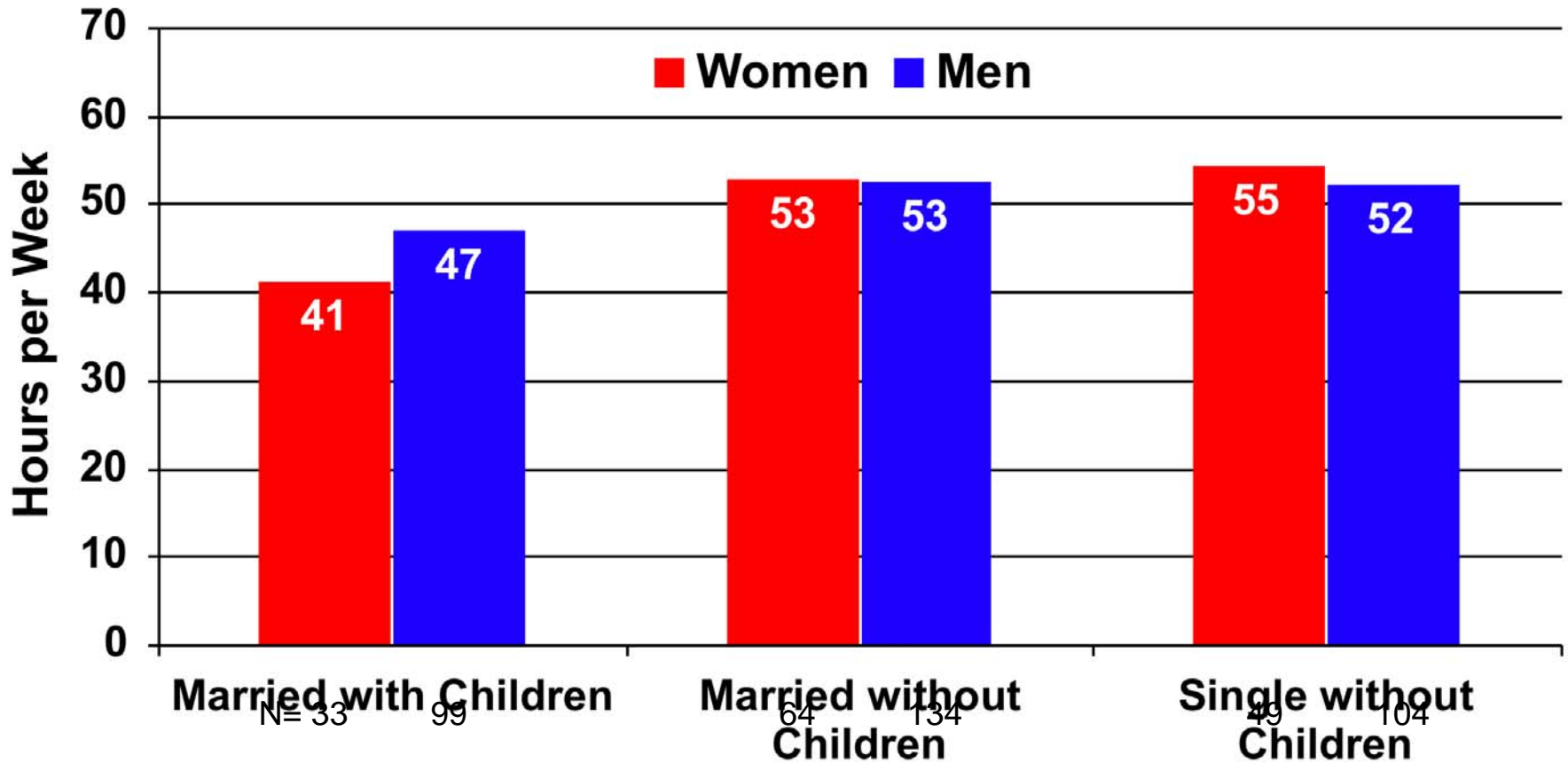
Source: Mason, Mary Ann and Marc Goulden. 2006. "UC Doctoral Student Career Life Survey." (<http://ucfamilyedge.berkeley.edu/grad%20life%20survey.html>).

**Figure 8: Shifting Career Goal away from Professor with Research Emphasis:
UC Postdoctoral Scholars, by Gender and Family Status/Future Plans**



Percent of Postdocs with Professor with Research Emphasis Goal at Start Who Shifted Career Goal to Another by Time of Survey

Average Number of Hours Worked Each Week as a Postdoc

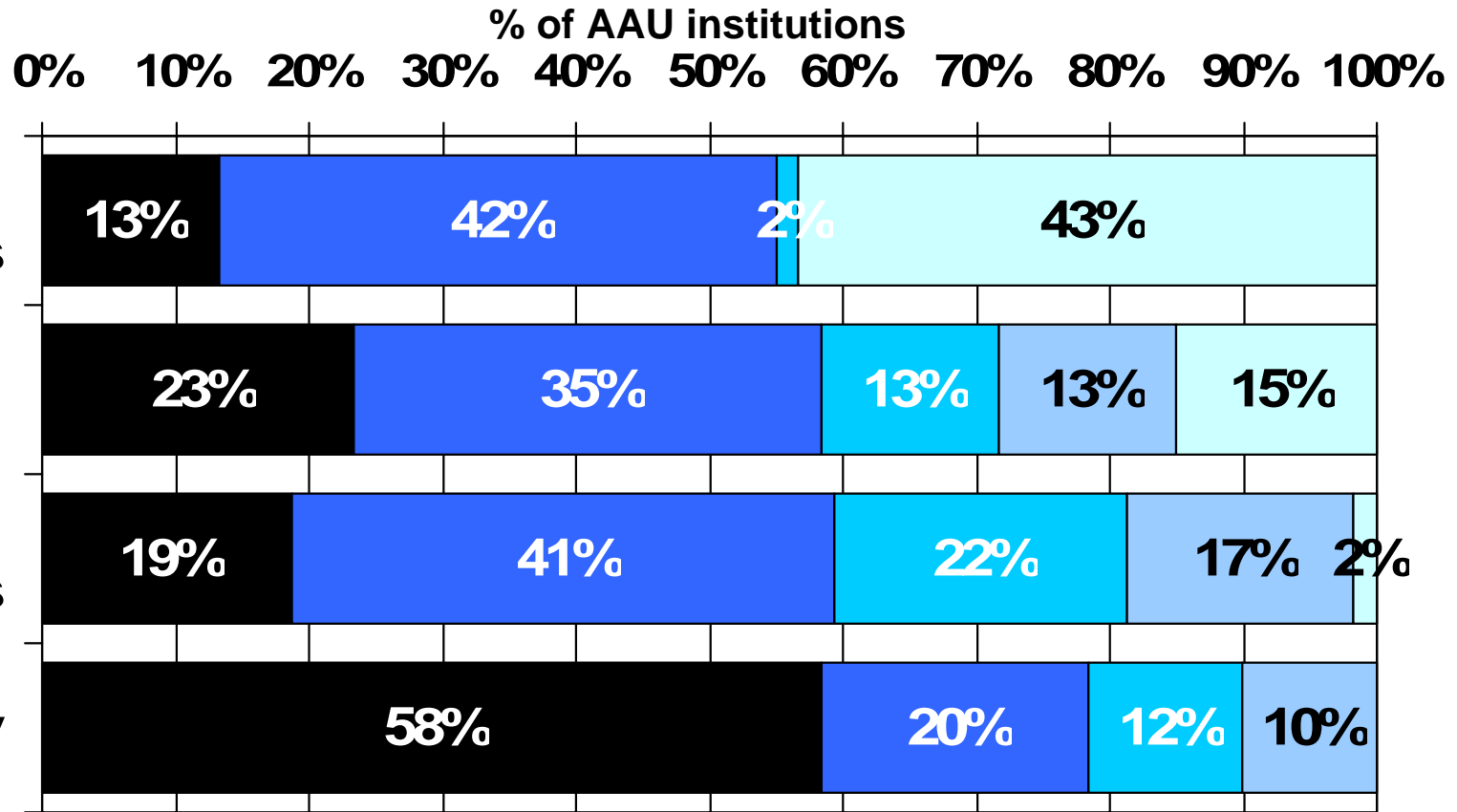


**Figure 10: Shifting Goal away from Professor w. Research Emphasis: All 13 Respondent Explanations*:
UC Women PhD Stud. Parents Paid Off Federal Grants at Time of Birth/Adopt. Event**

- Can't keep working 60 hours a week b/c of family.
- Having a child.
- I don't see how I could balance family and career as a professor at a research university, as I find it increasingly rewarding and necessary to be with my children.
- I have always been conflicted about the amount of time I want to devote to career and family. I like research. I like academia. I also like working in the non-profit world. Geographic location - proximity to family is also important to me, and I would compromise on career to be closer to family and/ or a location I am comfortable in.
- I haven't had an outstanding graduate career in terms of making an impact on my field and I don't see myself wanting to put in enough time and effort to be an outstanding postdoc (the next step). I am not willing to sacrifice my home life to become a top-notch academic. Plus, I am very interested in communicating science to the public and I love writing, so a career in science writing or science outreach has become my focus.
- I often feel disgusted by the political climate found in academic settings. Having ones idealistic notions that merit will trump spin dashed is a painful experience. Furthermore, I am frustrated and annoyed by the attitude/reality that unless you are brilliant or childless with a very supportive spouse you should not expect a pleasant career. The propagation of these ideas by senior faculty has disgusted me.
- I think it might be easier to balance work and family in a faculty position where the emphasis is on teaching. I have also found that while I enjoy research, my strength is teaching.
- I think that working as an academic at a major research university will be too difficult (very stressful) for me, as a person who wants to expand her family in the very near future.
- I waiver because of the amount of time needed to work at a research institution and the lack of salary that it entails (not enough to justify moving my entire family to an area where my partner might not be able to find work in his field).
- I've realized that an academic career that involves research AND teaching demands far more time than I'm willing to take away from my family.
- Largely due to familial responsibilities and time commitments. I feel that for me, research demands too much time away from my family. Also, as a woman, I don't feel as if current academic environments are any more supportive of women with families in research. The majority of women I've seen in research do not hold high faculty position, and those with families are even fewer. I do not want to sacrifice family for career, so I've changed my goals to accommodate these

*3 women respondents chose not to explain their reason for shifting their career goal away from Professor (res, emphasis).
changes. Now I would like to miss as little as possible in my children's lives.
Source: Mason, Mary Ann and Marc Goulden. 2006. UC Doctoral Student Career Life Survey. (<http://ucfamilyedge.berkeley.edu/grad%20life%20survey.html>).

Figure 11: Provision of Paid Maternity Leave for Academic Populations at Association of American Universities (AAU) (60 of 62 total)



Black = Entitlement to at least 6 weeks of paid leave.

Blue = Limitations to paid leave (e.g., only for particular groups, partial pay, less than 6 weeks, requirements for previous service time, etc.).

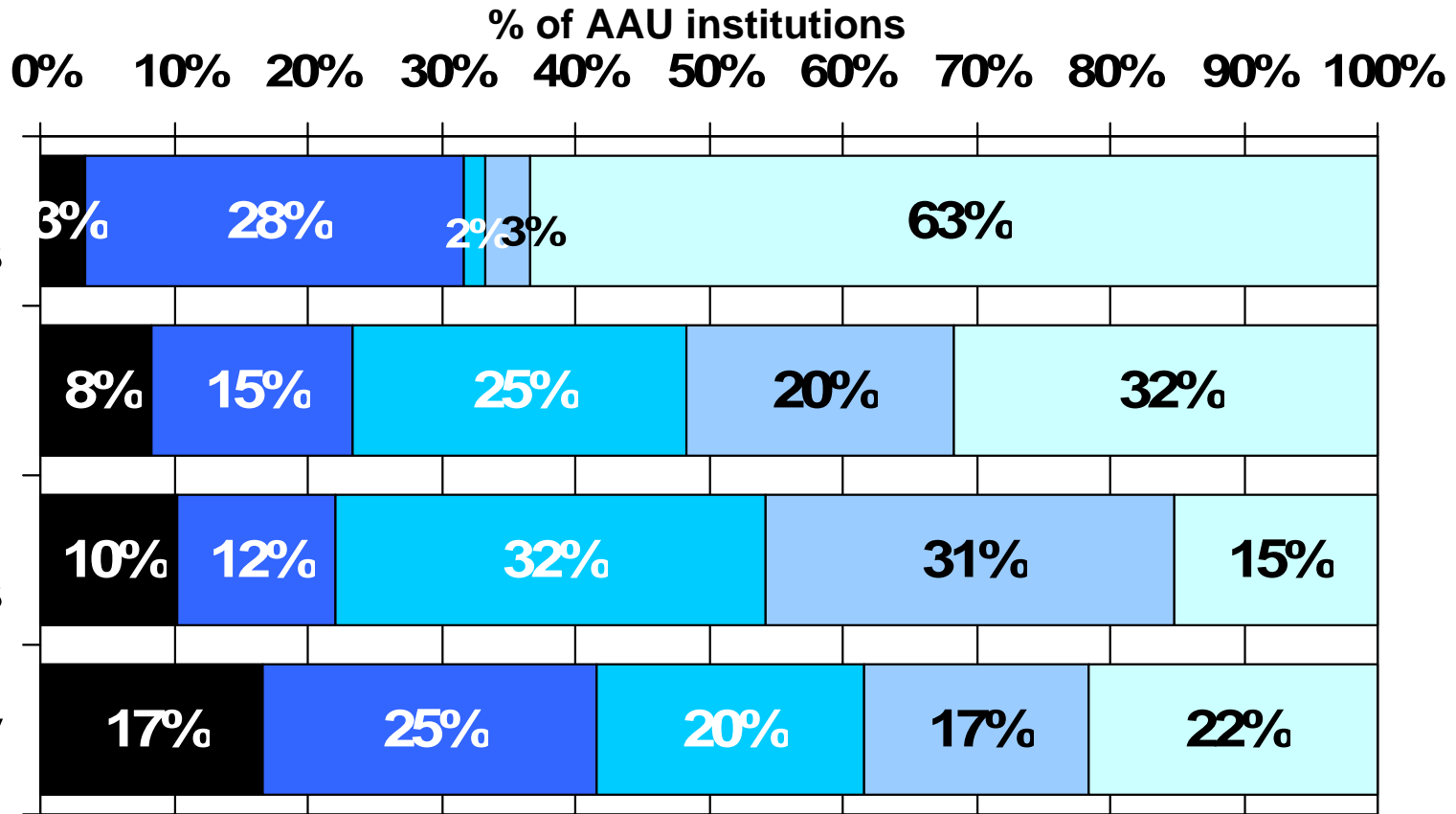
Turquoise = Paid leave depends on sick and/or vacation leave accruals.

Lighter Blue = Delay in availability of sick and/or vacation leave accruals, ie., FMLA.

Lightest Blue = Less, ad hoc, or no paid leave available.

Source: Mason, Mary Ann, Marc Goulden, and Karie Frasch. 2008. "Family Accommodation Policies for Researchers at AAU Universities Survey."

Figure 12: Provision of Paid Parental Leave for Academic Populations at Association of American Universities (AAU) (60 of 62 total)



Black = Entitlement to at least 1 week of paid leave.

Blue = Limitations to paid leave (e.g., only available to primary caregiver, only for particular groups, partial pay, requirements for previous service time, etc.).

Turquoise = Paid leave depends on sick and/or vacation leave accruals.

Lighter Blue = Delay in availability of sick and/or vacation leave accruals, ie., FMLA.

Lightest Blue = Less, ad hoc, or no paid leave available.

Figure 13: Title IX: Pregnancy & Family Status Discrimination

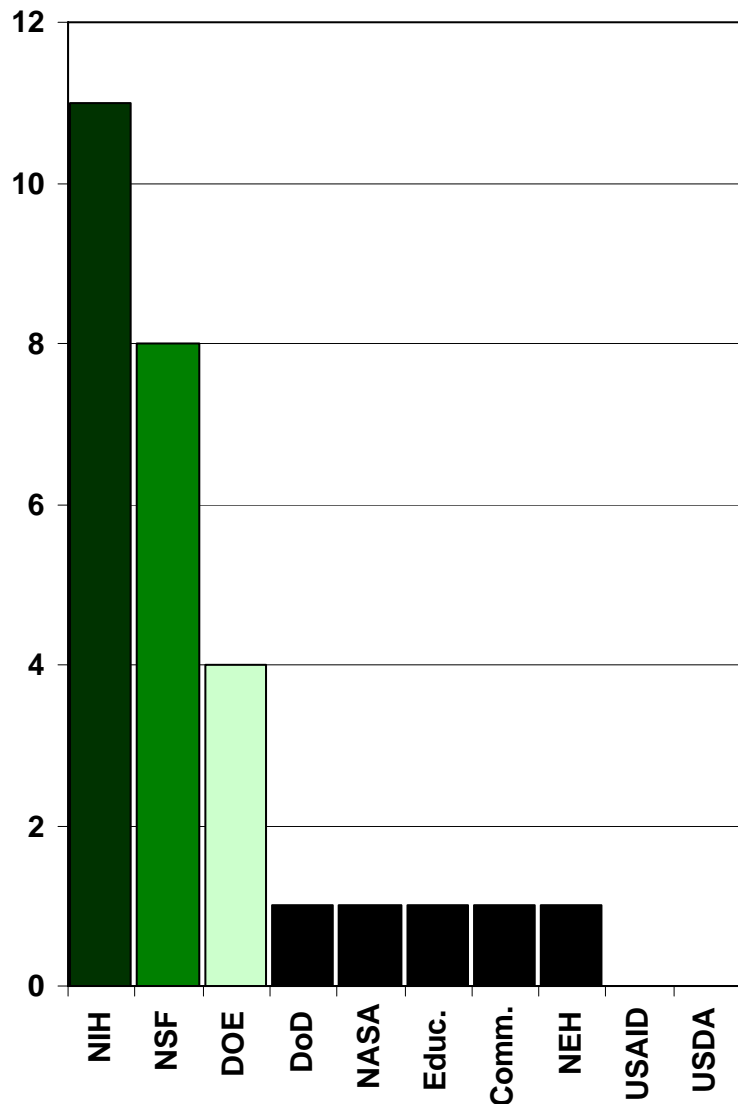
“No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance.”¹

- (a) **General.** A recipient shall not apply any policy or take any employment action:
- (1) **Concerning the potential marital, parental, or family status of an employee. . . which treats persons differently on the basis of sex; or**
 - (2) Which is based upon whether an employee or applicant for employment is the head of household or principal wage earner in such employee's or applicant's family unit.
- (b) **Pregnancy.** A recipient shall not discriminate against or exclude from employment any employee or applicant for employment on the basis of pregnancy, childbirth, false pregnancy, termination of pregnancy, or recovery therefrom.
- ...
- (d) **Pregnancy leave.** In the case of a recipient which does not maintain a leave policy for its employees, or in the case of an employee with insufficient leave or accrued employment time to qualify for leave under such a policy, **a recipient shall treat pregnancy, childbirth, false pregnancy, termination of pregnancy and recovery therefrom as a justification for a leave of absence without pay for a reasonable period of time, at the conclusion of which the employee shall be reinstated to the status which she held when the leave began or to a comparable position, without decrease in rate of compensation or loss of promotional opportunities, or any other right or privilege of employment.**²

¹ 20 U.S.C. § 1681.

² 45 C.F.R. 618.530 (National Science Foundation); 45 CFR 86.57 (Department of Health and Human Services, including the National Institutes of Health); 10 CFR 1040.53; (Department of Energy).

Figure 14: Possible Family Friendly Offerings by Federal Agencies to Support Researchers Paid Off of Grants/Contracts and PIs



Possible Offering	# offer
1. No Cost Extensions	8
2. Supplements to support family accommodations	3
3. Policy or statements supporting women in the academic pipeline	3
4. Gender equity workshops	3
5. Part-time effort on fellowship or grant to accommodate family caregiving needs	2
6. Outreach efforts to encourage women applicants	2
7. Extend fellowship period for caregiving	2
8. Clear policy expectations for various classes of researchers	1
9. Defer start of fellowship period for caregiving	1
10. Allow dependent care expenses to be charged to grants for conferences or meetings	1
11. Re-entry grants for those who have stopped out for family caregiving needs	1
12. Discount caregiving resume gaps in grant reviews	0
13. Provide instructions to peer reviewers on family accommodations	0
14. Data collection on gender and family status	0
15. No time-based application restrictions – e.g., begin within X years after degree	?

Source: Mason, Goulden, Frasch, "Federal Agencies Survey," 08-09.

Possible Policy Recommendations – Universities and Federal Agencies

- 1. Promote clear, well-communicated, base-line family accommodation policies for all classes or researchers.***
 - Federal Agencies can play a role in this by setting clear policies for various classes of researchers (e.g. NIH Kirchstein Fellows).**
 - Universities can be more proactive (draw on best practices).**
- 2. Provide Federal Agency or University supplements to offset family event productivity loss and help PIs.***
 - Use some stimulus money to fund supplements.**
 - Explore funding models: University direct costs vs. indirect costs.**
- 3. Collaboratively, move toward a full package of family friendly policies/resources that take into account the career/family life-course.***
- 4. Remove time-based criteria for fellowships and productivity assessments that does not acknowledge in a meaningful way family events and their impact on career timing (start and end dates).***
 - Discount resume gaps due to family issues.**
 - Provide relevant instructions to peer reviewers.**
- 5. Collect and analyze the necessary data to assure Title IX compliance and assess the efficacy of existing and future policy initiatives.***