

THE GLOBAL SURVEY ITS HISTORY AND FUTURE

Laura Merner

The American Institute of Physics

- An organization providing services to 10 physics-related societies, including the American Physical Society and the American Astronomical Society
- Has a Statistical Research Center with 12 employees all specializing in survey methodology and statistics

The Global Surveys of Physicists

- With Women's Working Group of the International Union of Pure and Applied Physics (IUPAP), American Institute of Physics has done 3 global surveys
- Associated with International Conferences of Women in Physics
 - 2002, Paris
 - 2005, Rio de Janeiro
 - 2008, Seoul (a larger effort that took several years)

Why a Global Survey of Physicists?

- Goal: To describe common problems that women in physics across the world face in their work and education
- We must have data on factors that affect women's careers so that we know where the problems lie. Then we can take action!

The first two global surveys of physicists

- More than 1000 women from more than 50 countries responded to each survey
- Only women were included
- English only
- Focused on women's
 - Education
 - Work and family
 - Opportunities
 - Resources

Purposes of third survey

- To ensure comparability across countries— one report at the end of the process
- To show whether women physicists' experiences are different from men's
 - Opportunities
 - Resources
 - Career Advancement
- To provide survey in languages other than English
- Funded by Henry Luce Foundation & National Science Foundation

Languages

- English
- French
- Russian
- Arabic
- Simplified Chinese
- Spanish
- German
- Japanese

GLOBAL SURVEY OF PHYSICISTS

لإجراء استطلاع الرأي باللغة العربية، انقر هنا. [مرحبًا بكم في استطلاع الرأي العالمي بشأن الفيزيائيين](#)

欢迎参与全球物理工作者调查。 [以中文参与调查，请点击此处](#)

Welcome to the Global Survey of Physicists. [To take the survey in English, click here](#)

Bienvenue à l'étude mondiale à l'intention des physiciens et physiciennes. [Pour participer à cette étude en français, cliquez ici](#)

Wir möchten Sie bei der globalen Umfrage unter Physikerinnen und Physikern begrüßen. [Klicken Sie hier, um die Umfrage in deutscher Sprache auszufüllen](#)

物理学者に関する世界的調査へのご協力ありがとうございます。
[日本語でアンケートにお答えいただく場合は、ここをクリックしてください](#)

Добро пожаловать во всемирный опрос физиков. [Чтобы пройти опрос на русском языке, нажмите здесь](#)

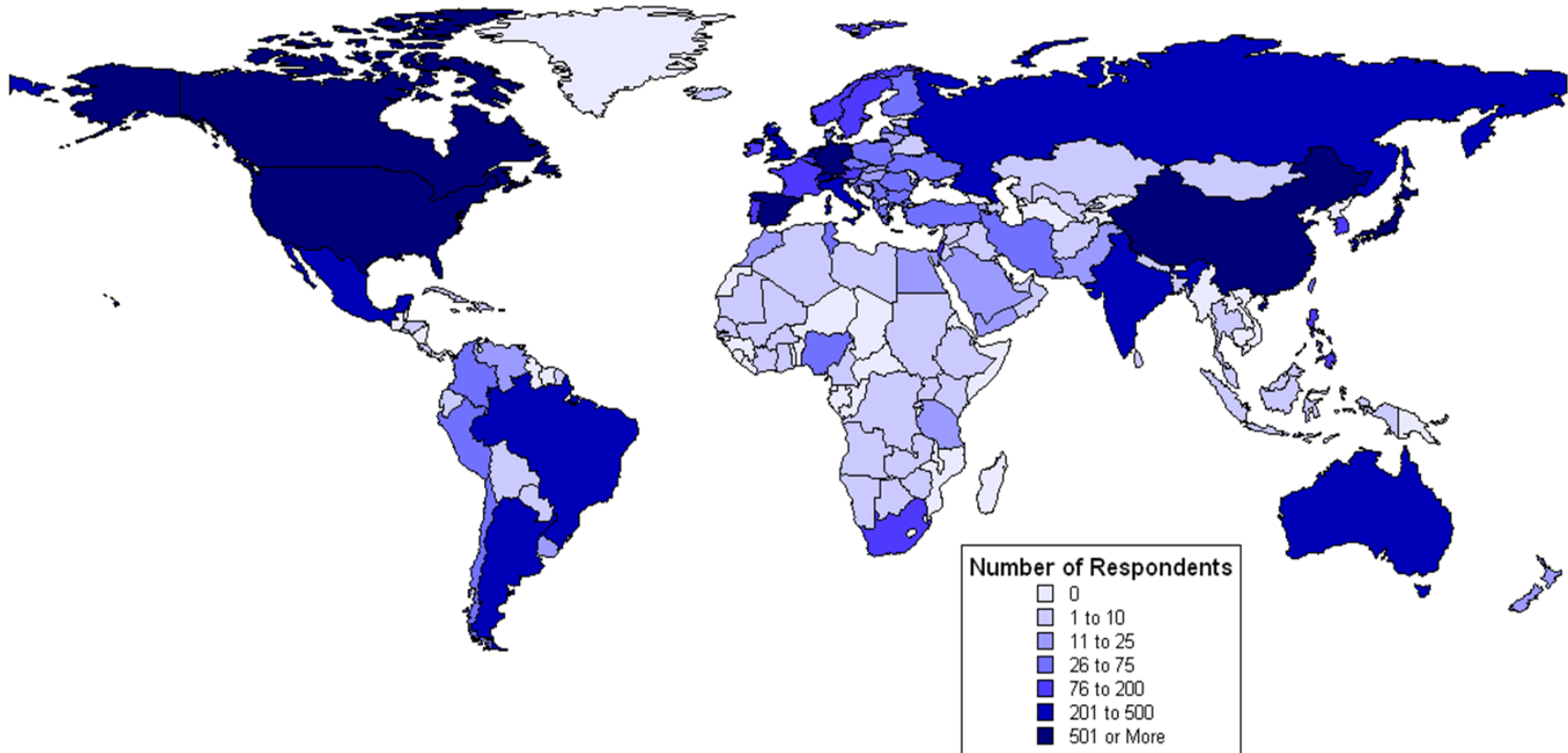
Le damos la bienvenida a la Encuesta global de profesionales de la física. [Para hacer la encuesta en español, haga clic aquí](#)

How the survey was distributed

- Web survey sent to country leaders from conference
- Survey itself contained instructions to forward to colleagues
- Sample surveys were drawn by American and German Physical Societies, so their results are representative of their membership.
- Survey went to entire membership of Japanese Physical Society.
- Open from ~Oct. 2009-Oct. 2010

Global Survey of Physicists, 2010

Global Survey of Physicists; Most Recent Country of Respondent



Who Responded?

- 130 countries
- 14,932 respondents
- 75% from Very Highly Developed Countries* (21% Female)
- 25% from Less Developed Countries* (27% Female)
- Employed in all types of jobs
- Students included

*Starting in 2016, the UN no longer uses this designation.

Very Highly Developed Nations

United Nations, 2010

- Norway
- Australia
- New Zealand
- United States
- Ireland
- Liechtenstein
- Netherlands
- Canada
- Sweden
- Germany
- Japan
- Korea (Republic of)
- Switzerland
- France
- Israel
- Finland
- Iceland
- Belgium
- Denmark
- Spain
- Hong Kong, China (SAR)
- Greece
- Italy
- Luxembourg
- Austria
- United Kingdom
- Singapore
- Czech Republic
- Slovenia
- Andorra
- Slovakia
- United Arab Emirates
- Malta
- Estonia
- Cyprus
- Hungary
- Brunei Darussalam
- Qatar
- Bahrain
- Portugal
- Poland
- Barbados

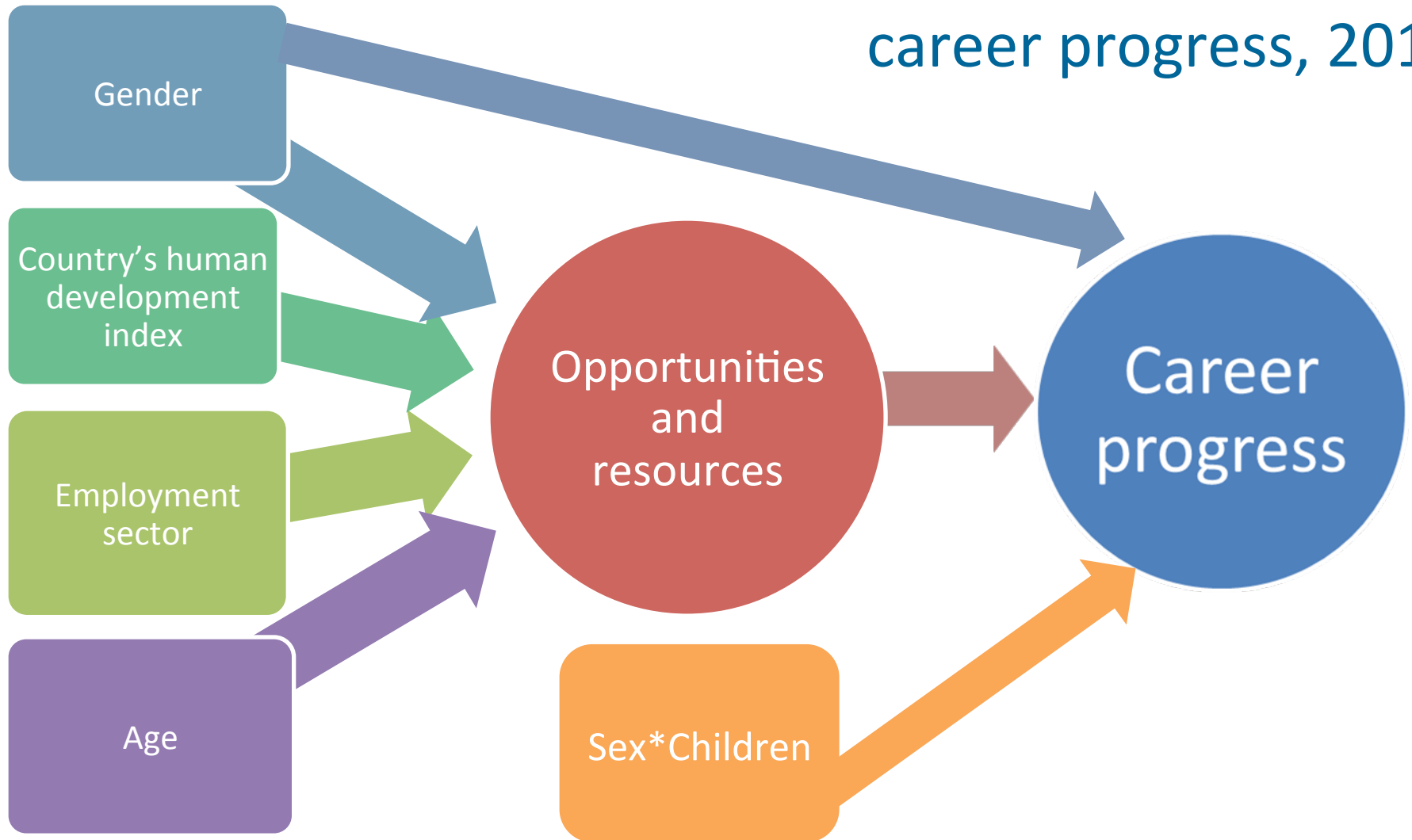
Percentage of respondents with access to key resources

	Less Developed		Very Highly Developed	
	Women	Men	Women	Men
Funding	34	51	52	60
Office space	64	74	72	77
Lab space	42	47	46	52
Equipment	42	49	58	64
Travel money	31	47	57	64
Clerical support	22	38	30	43
Employees or students	42	53	33	43

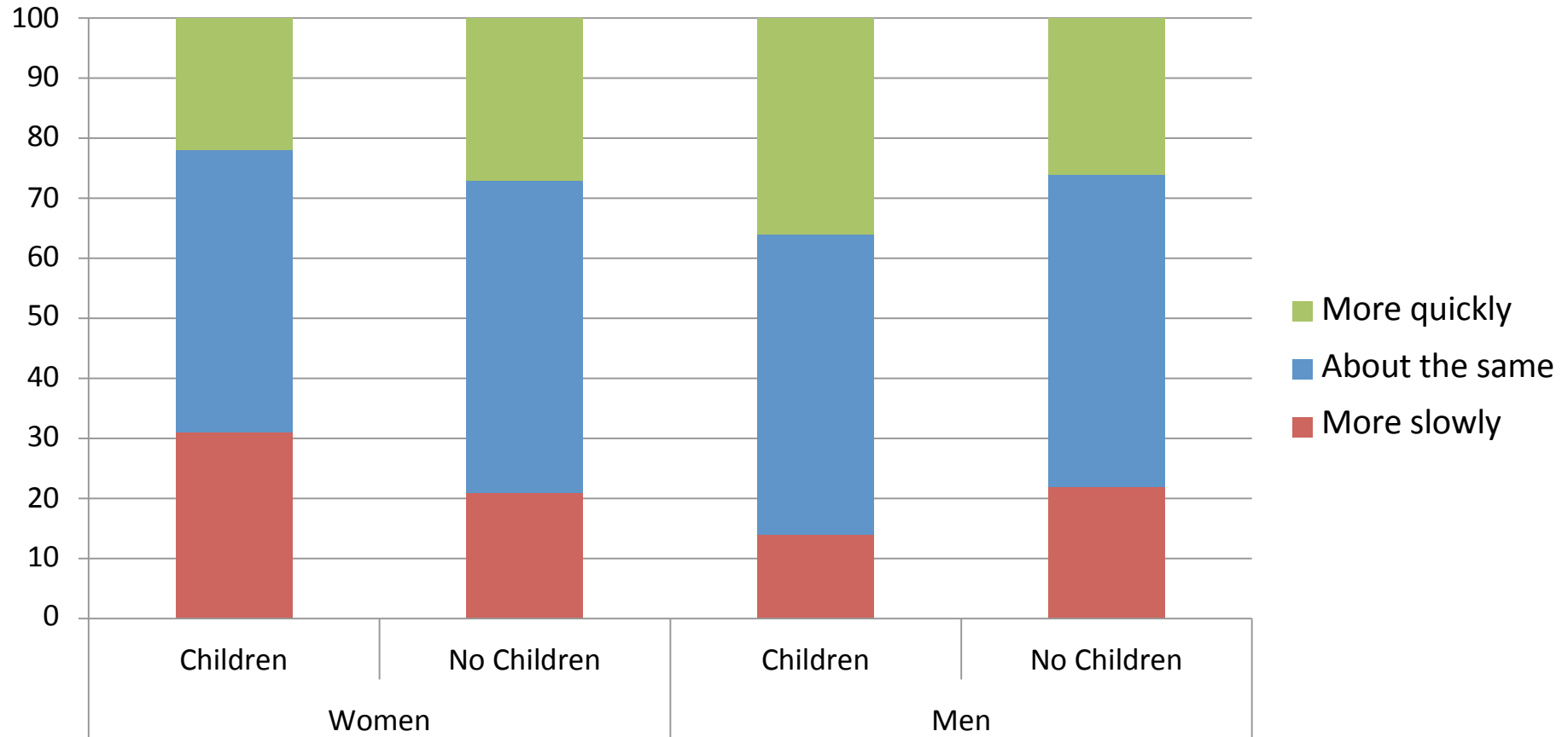
% of R's w/ career-advancing opportunities

% Yes	Less Developed		Very Highly Developed	
	Women	Men	Women	Men
Given a talk at a conference as an invited speaker	51	67	58	73
Attended a conference abroad	75	81	83	87
Conducted research abroad	54	71	61	69
Acted as a boss or manager	38	53	46	61
Served as editor of a journal	16	24	11	19
Served on committees for grant agencies	22	37	26	36
Served on important committees at your institute or company	50	62	48	60
Served on an organizing committee for a conference in your field	48	59	48	55
Advised undergraduate students	82	84	69	74
Advised graduate students	63	77	58	70
Served on thesis or dissertation committees (not as an advisor)	52	66	37	52

The effects of opportunities and resources on career progress, 2010



Compared to colleagues, how quickly have you progressed in your career?



Successes of the Global Survey of Physicists

- Clearly showed inequality between men and women
 - Career-advancing opportunities and resources needed to advance are not distributed equally
 - Clear link between resources/opportunities and career outcomes
 - Showed effect of cultural expectations about child care on women's careers
- Showed consistencies across countries

What could have been improved

- Questionnaire itself worked very well, although somewhat too long
- Distribution: a few physical societies were very enthusiastic, others were less so
- Results: due to very small numbers of women, some countries could not receive individual results because of risk of disclosure
- Not enough funds to translate all answers to open-ended questions, not enough time to analyze
- Dissemination plan should have been made in advance

The Global Survey Going Forward

- This version will include men and women from all scientific disciplines in as many countries as we can reach.
- Questions should include experiences people may have in all continents and in all included disciplines.
- Steps must be taken at every stage to ensure confidentiality of respondents

Goals For This Meeting

In three sessions, we will

1. Review specific questions
2. Gather input on full survey

Does the survey work for this region and for all disciplines?

3. Outline distribution plan--*we are relying on you!*

How can we prepare for the next Global Survey?

- The goals of the questionnaire must be clearly stated. What do we want to learn?
- No question should be on the questionnaire unless it clearly supports our goals and overall research questions.
- Research questions also tell us how to do the analysis.
- The research questions were agreed upon at the first meeting of this project in Paris in June 2017.

Criteria for Choice of Research Questions

- Choose research questions that allow us to focus on access to *resources* to do work and *opportunities* to contribute to science.
- These allow us to document inequality and make specific recommendations to lessen inequality.
- It is easier for our unions to recommend that resources be distributed equally than for our unions to recommend that people's attitudes be changed.

Research Questions

Goal: Better knowledge of the gender gap in science around the world

- Comparisons across
 - regions,
 - countries,
 - disciplines,
 - level of economic development of the country (Human Development Index)
 - sector of employment (academia, industry, school),
 - age (younger and older respondents),
 - attempt to explore trends in time (best to conduct survey again)
- scientists' development of interest in science,
- experiences in education and careers,
- work-life balance,
- family support,
- demographics,
- access to resources needed to conduct science, and
- opportunities to contribute to the scientific enterprise

How the new survey has been developed

- We looked at old questionnaire and at UNESCO SAGA questionnaire
- We reviewed each question
 - Does it meet our goals?
 - How it will contribute to findings?
 - In other words, does it answer the research questions?
 - We cannot include questions just because we think the answers will be “interesting.”
- Legacy questions—some questions can't be changed

Responses are sensitive to any type of change in the question

- Once we had a questionnaire with a scale.

Answer 1 to 5

Excellent

Poor

1 2 3 4 5

- In the next version, we put labels on 2, 3, and 4.
- The percentages answering 1 or 5 totally changed!

During and After the Regional Meetings

- We will be looking for feedback on the draft questionnaire from the participants.
- In some cases, you will be asked to work in small groups and try to reach a consensus.
- All suggestions will be considered.
- Task 1 partners will modify questionnaire to reflect suggestions made at regional meetings.
- Questionnaire will be sent for professional translation.

Why professional translation?

- Quality of translation can affect data quality and comparability.
- Good professional translators use data driven approaches to word choice, avoiding nuances that lay persons can overlook.
- Professional translation can ensure comparability across languages.
- Professional translators can be neutral about cultural differences.
- If a translation is not good, people may refuse to participate or answer differently than we expect.

Distribution of questionnaire—How?

- Task 1 team will work with partner unions to ask for help distributing, possibly through various committees.
- Everyone at the regional meetings will help us distribute questionnaire in 2018.
- Survey will contain instructions to forward.
- Or people can forward an email with a link.

Timing and Target Audience

- Survey will be available after translation in the spring of 2018.
- Will be open several months.
- We are looking for scientists and science students in all disciplines, especially the disciplines represented in this room.

How data will be collected

- American Institute of Physics will program questionnaire, host on our secure server, collect answers, and ensure respondent confidentiality.
- We can take as many respondents as we get.

Staff from American Institute of Physics Statistical Research Center

- Rachel Ivie
- Laura Merner, PhD, Survey Scientist
- Mark McFarling, Technical Research Systems Administrator
- John Tyler, Senior Research Analyst

How you can help

We are looking for feedback.

- Are the questions appropriate for your culture and region?
- Do we have the right questions to answer the research questions?
 - *Survey is already at its maximum length. New questions will require removing existing ones.*
- Ideas and tools for distribution

Review Goals For This Meeting

In three sessions, we will

1. Review specific questions
2. Gather input on full survey in small groups
Does the survey work for this region and for all disciplines?
3. Outline distribution plan--*we are relying on you!*

Thank you!

For more information

Rachel Ivie
Director
Statistical Research Center
rivie@aip.org
<http://www.aip.org/statistics>