

**PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES**  
ADDITIONAL RESOURCES FOR:  
**NATIONAL HIRING EXPERIMENTS REVEAL 2:1**  
**FACULTY PREFERENCE FOR WOMEN ON STEM TENURE TRACK**  
W.M. WILLIAMS & S.J. CECI  
(PUBLISHED APRIL 13, 2015)

SEE VIDEO “NATIONAL STEM FACULTY HIRING EXPERIMENTS” AT  
[WWW.CIWS.CORNELL.EDU](http://WWW.CIWS.CORNELL.EDU)

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## I. THREE SETS OF SAMPLE MATERIALS FOR EXPERIMENTS 1-3

Set #1 - single, childless male applicant pitted against single, childless female applicant, counterbalanced for personae.

Set #2 - divorced mother of two pitted against father of two with stay-at-home spouse, counterbalanced for personae.

Set #3 - married mother of two who took a one-year leave pitted against a mother of two who did not take a one-year leave, counterbalanced for personae.

Materials were sent out in counterbalanced manner, half to female and half to male faculty, stratified by Carnegie classification and field, alternating versions within faculty gender. This method enabled comparisons of voting preferences for male vs. female faculty choosing among male and female candidates, depicted in alternating forms with female or male adjectives (“personae”), which were also counterbalanced.

**Condition 1.1: Single man with no children versus single woman with no children (in this version Dr. X is a woman with female personae; and in this version Dr. Z is a man with male personae).**

Imagine you are on your department’s personnel/search committee. Your department plans to hire one person at the entry assistant-professor level. Your committee has struggled to narrow the applicant pool to three short-listed candidates (below), each of whom works in a hot area with an eminent advisor. The search committee evaluated each candidate’s research record, and the entire faculty rated each candidate’s job talk and interview on a 1-to-10 scale; average ratings are reported below. Now you must rank the candidates in order of hiring preference. Please read the search committee chair’s notes below and rate each candidate. The notes include comments made by some candidates regarding partner-hire and family issues, including the need for guaranteed slots at university daycare. If the candidate did not mention family issues, the chair did not discuss them.

**Dr. X:** X impressed the entire search committee as a great potential hire. Based on her vita, letters of recommendation, and their own reading of her work, the search committee rated X’s research record as “extremely strong.” Letter-writers especially noted that X is highly creative and original in her approach to scholarship, with comments like “X is poised to break new ground with her unique and imaginative applications of her advisor’s theory, and is sure to change how people think about her research area.” They also described X’s impressive teaching abilities, mentioning that she was “widely considered an effective and supportive mentor by the junior graduate students and undergraduates she worked with.” She also won a teaching award in graduate school. X’s faculty job talk/interview score was 9.5/10. At dinner with the committee, she reached out to everyone, showing herself to be very likeable, kind, and socially skilled. During our private meeting, X was enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer her the job. She mentioned that she is single with no partner/family issues. X said our department has all the resources needed for her research.

**Dr. Y:** Y came across during his interview/visit as a smart, serious scholar with a solid record. Based on his vita, letters of recommendation, and their own reading of his work, the committee rated his research record as “very strong.” Y’s letter-writers all praised the “breadth and quality of

his research and ideas” and described him as a “highly desirable hire among his cohort of graduate students.” They also noted that Y works on an “established set of paradigms sure to continue to generate publications and funding in the future.” Y’s faculty job talk/interview score was 9.3/10. One issue raised by two members of the search committee is that Y is somewhat shy and reserved; thus there was some question about his ability to handle large introductory lecture courses. No one foresaw any problems with his teaching in a small-seminar context. At dinner, Y was pleasant but spoke little and was a bit hard to get to know—however, most of us felt this would resolve in time. During my private discussion with Y, he seemed enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer him the job. He did not mention any partner/family issues. Y said our department has all the resources he needs for his research.

**Dr. Z:** Z struck the search committee as a real powerhouse. Based on his vita, letters of recommendation, and their own reading of his work, the committee rated Z’s research record as “extremely strong.” Z’s recommenders all especially noted his high productivity, impressive analytical ability, independence, ambition, and competitive skills, with comments like “Z produces high-quality research and always stands up under pressure, often working on multiple projects at a time.” They described his tendency to “tirelessly and single-mindedly work long hours on research, as though he is on a mission to build an impressive portfolio of work.” He also won a dissertation award in his final year of graduate school. Z’s faculty job talk/interview score was 9.5/10. At dinner with the committee, he impressed everyone as being a confident and professional individual with a great deal to offer the department. During our private meeting, Z was enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer him the job. He said he is single with no partner/family issues. Z said our department has all the resources needed for his research.

Please rate each applicant using the following scale, ranging from 1 to 10:

10=truly extraordinary/exceptional

9=extremely impressive

8=high-excellent

7=low-excellent

6=extremely good

5=very good

4=good

3=acceptable

2=marginally acceptable

1=cannot support

Please rate each candidate:

X \_\_\_\_\_

Y \_\_\_\_\_

Z \_\_\_\_\_

Please rank each candidate:

#1 (best) \_\_\_\_\_

#2 (2<sup>nd</sup> best) \_\_\_\_\_

#3 (3<sup>rd</sup> best) \_\_\_\_\_

Your position:

Assistant \_\_\_\_\_

Associate \_\_\_\_\_

Full \_\_\_\_\_

Year of Ph.D. \_\_\_\_\_

Major Field/Discipline \_\_\_\_\_

Approximately how many times have you served on a search committee to hire at the assistant professor rank? \_\_\_\_\_

Optional comments?

Check here if you want the url for the website once data are available. \_\_\_\_\_

THANK YOU!

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**Condition 1.2: Single man with no children versus single woman with no children (in this version Dr. X is a man with female persona; and in this version Dr. Z is a woman with male persona).**

Imagine you are on your department's personnel/search committee. Your department plans to hire one person at the entry assistant-professor level. Your committee has struggled to narrow the applicant pool to three short-listed candidates (below), each of whom works in a hot area with an eminent advisor. The search committee evaluated each candidate's research record, and the entire faculty rated each candidate's job talk and interview on a 1-to-10 scale; average ratings are reported below. Now you must rank the candidates in order of hiring preference. Please read the search committee chair's notes below and rate each candidate. The notes include comments made by some candidates regarding partner-hire and family issues, including the need for guaranteed slots at university daycare. If the candidate did not mention family issues, the chair did not discuss them.

**Dr. X:** X impressed the entire search committee as a great potential hire. Based on his vita, letters of recommendation, and their own reading of his work, the search committee rated X's research record as "extremely strong." Letter-writers especially noted that X is highly creative and original in his approach to scholarship, with comments like "X is poised to break new ground with his unique and imaginative applications of his advisor's theory, and is sure to change how people think about his research area." They also described X's impressive teaching abilities, mentioning that he was "widely considered an effective and supportive mentor by the junior graduate students and undergraduates he worked with." He also won a teaching award in graduate school. X's faculty job talk/interview score was 9.5/10. At dinner with the committee, he reached out to everyone, showing himself to be very likeable, kind, and socially skilled. During our private meeting, X was enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer him the job. He mentioned that he is single with no partner/family issues. X said our department has all the resources needed for his research.

**Dr. Y:** Y came across during his interview/visit as a smart, serious scholar with a solid record. Based on his vita, letters of recommendation, and their own reading of his work, the committee rated his research record as "very strong." Y's letter-writers all praised the "breadth and quality of

his research and ideas” and described him as a “highly desirable hire among his cohort of graduate students.” They also noted that Y works on an “established set of paradigms that are sure to continue to generate publications and funding in the future.” Y’s faculty job talk/interview score was 9.3/10. One issue raised by two members of the search committee is that Y is somewhat shy and reserved; thus there was some question about his ability to handle large introductory lecture courses. No one foresaw any problems with his teaching in a small-seminar context. At dinner, Y was pleasant but spoke little and was a bit hard to get to know—however, most of us felt this would resolve in time. During my private discussion with Y, he seemed enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer him the job. He did not mention any partner/family issues. Y said our department has all the resources he needs for his research.

**Dr. Z:** Z struck the search committee as a real powerhouse. Based on her vita, letters of recommendation, and their own reading of her work, the committee rated Z’s research record as “extremely strong.” Z’s recommenders all especially noted her high productivity, impressive analytical ability, independence, ambition, and competitive skills, with comments like “Z produces high-quality research and always stands up under pressure, often working on multiple projects at a time.” They described her tendency to “tirelessly and single-mindedly work long hours on research, as though she is on a mission to build an impressive portfolio of work.” She also won a dissertation award in her final year of graduate school. Z’s faculty job talk/interview score was 9.5/10. At dinner with the committee, she impressed everyone as being a confident and professional individual with a great deal to offer the department. During our private meeting, Z was enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer her the job. She said she is single with no partner/family issues. Z said our department has all the resources needed for her research.

Please rate each applicant using the following scale, ranging from 1 to 10:

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Y \_\_\_\_\_

Z \_\_\_\_\_

Please rank each candidate:

#1 (best) \_\_\_\_\_

#2 (2<sup>nd</sup> best) \_\_\_\_\_

#3 (3<sup>rd</sup> best) \_\_\_\_\_

Your position:

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Associate \_\_\_\_\_

Full \_\_\_\_\_

Year of Ph.D. \_\_\_\_\_

Major Field/Discipline \_\_\_\_\_

Approximately how many times have you served on a search committee to hire at the assistant professor rank? \_\_\_\_\_

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**Condition 7.1: Married father of two with stay-at-home spouse versus divorced mother of two with ex-spouse not relocating. (In this version Dr. X is a man with female persona; and in this version Dr. Z is a woman with male persona.)**

Imagine you are on your department's personnel/search committee. Your department plans to hire one person at the entry assistant-professor level. Your committee has struggled to narrow the applicant pool to three short-listed candidates (below), each of whom works in a hot area with an eminent advisor. The search committee evaluated each candidate's research record, and the entire faculty rated each candidate's job talk and interview on a 1-to-10 scale; average ratings are reported below. Now you must rank the candidates in order of hiring preference. Please read the search committee chair's notes below and rate each candidate. The notes include comments made by some candidates regarding partner-hire and family issues, including the need for guaranteed slots at university daycare. If the candidate did not mention family issues, the chair did not discuss them.

**Dr. X:** X impressed the entire search committee as a great potential hire. Based on his vita, letters of recommendation, and their own reading of his work, the search committee rated X's research record as "extremely strong." Letter-writers especially noted that X is highly creative and original in his approach to scholarship, with comments like "X is poised to break new ground with his unique and imaginative applications of his advisor's theory, and is sure to change how people think about his research area." They also described X's impressive teaching abilities, mentioning that he was "widely considered an effective and supportive mentor by the junior graduate students and undergraduates he worked with." He also won a teaching award in graduate school. X's faculty job talk/interview score was 9.5/10. At dinner with the committee, he reached out to everyone, showing himself to be very likeable, kind, and socially skilled. During our private meeting, X was enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer him the job. He mentioned that their two children are cared for by his wife, a stay-at-home mother, thus he will not need space at university daycare. X said our department has all the resources needed for his research.

**Dr. Y:** Y came across during his interview/visit as a smart, serious scholar with a solid record.

Based on his vita, letters of recommendation, and their own reading of his work, the committee rated his research record as “very strong.” Y’s letter-writers all praised the “breadth and quality of his research and ideas” and described him as a “highly desirable hire among his cohort of graduate students.” They also noted that Y works on an “established set of paradigms that are sure to continue to generate publications and funding in the future.” Y’s faculty job talk/interview score was 9.3/10. One issue raised by two members of the search committee is that Y is somewhat shy and reserved; thus there was some question about his ability to handle large introductory lecture courses. No one foresaw any problems with his teaching in a small-seminar context. At dinner, Y was pleasant but spoke little and was a bit hard to get to know—however, most of us felt this would resolve in time. During my private discussion with Y, he seemed enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer him the job. He did not mention any partner/family issues. Y said our department has all the resources he needs for his research.

**Dr. Z:** Z struck the search committee as a real powerhouse. Based on her vita, letters of recommendation, and their own reading of her work, the committee rated Z’s research record as “extremely strong.” Z’s recommenders all especially noted her high productivity, impressive analytical ability, independence, ambition, and competitive skills, with comments like “Z produces high-quality research and always stands up under pressure, often working on multiple projects at a time.” They described her tendency to “tirelessly and single-mindedly work long hours on research, as though she is on a mission to build an impressive portfolio of work.” She also won a dissertation award in her final year of graduate school. Z’s faculty job talk/interview score was 9.5/10. At dinner with the committee, she impressed everyone as being a confident and professional individual with a great deal to offer the department. During our private meeting, Z was enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer her the job. She mentioned that her ex-husband will stay behind at his job and their two children will live with her. Thus she will need two slots at university daycare. Z said our department has all the resources needed for her research.

Please rate each applicant using the following scale, ranging from 1 to 10:

10=truly extraordinary/exceptional

9=extremely impressive

8=high-excellent

7=low-excellent

6=extremely good

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4=good

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Please rate each candidate:

X \_\_\_\_\_

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Please rank each candidate:

#1 (best) \_\_\_\_\_  
#2 (2<sup>nd</sup> best) \_\_\_\_\_  
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Your position:

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Associate \_\_\_\_\_

Full \_\_\_\_\_

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Major Field/Discipline \_\_\_\_\_

Approximately how many times have you served on a search committee to hire at the assistant professor rank? \_\_\_\_\_

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**Condition 7.2: Married father of two with stay-at-home spouse versus divorced mother of two with ex-spouse not relocating. (In this version Dr. X is a man with male persona; and in this version Dr. Z is a woman with female persona.)**

Imagine you are on your department's personnel/search committee. Your department plans to hire one person at the entry assistant-professor level. Your committee has struggled to narrow the applicant pool to three short-listed candidates (below), each of whom works in a hot area with an eminent advisor. The search committee evaluated each candidate's research record, and the entire faculty rated each candidate's job talk and interview on a 1-to-10 scale; average ratings are reported below. Now you must rank the candidates in order of hiring preference. Please read the search committee chair's notes below and rate each candidate. The notes include comments made by some candidates regarding partner-hire and family issues, including the need for guaranteed slots at university daycare. If the candidate did not mention family issues, the chair did not discuss them.

**Dr. X:** X struck the search committee as a real powerhouse. Based on his vita, letters of recommendation, and their own reading of his work, the committee rated X's research record as "extremely strong." X's recommenders all especially noted his high productivity, impressive analytical ability, independence, ambition, and competitive skills, with comments like "X produces high-quality research and always stands up under pressure, often working on multiple projects at a time." They described his tendency to "tirelessly and single-mindedly work long hours on research, as though he is on a mission to build an impressive portfolio of work." He also won a dissertation award in his final year of graduate school. X's faculty job talk/interview score was 9.5/10. At dinner with the committee, he impressed everyone as being a confident and professional individual with a great deal to offer the department. During our private meeting, X was enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer him the job. He mentioned that their two children are cared for by his wife, a stay-at-home mother, thus he will not need space at university daycare. X said our department has all the resources needed for his research.



**Dr. Y:** Y came across during his interview/visit as a smart, serious scholar with a solid record. Based on his vita, letters of recommendation, and their own reading of his work, the committee rated his research record as “very strong.” Y’s letter-writers all praised the “breadth and quality of his research and ideas” and described him as a “highly desirable hire among his cohort of graduate students.” They also noted that Y works on an “established set of paradigms that are sure to continue to generate publications and funding in the future.” Y’s faculty job talk/interview score was 9.3/10. One issue raised by two members of the search committee is that Y is somewhat shy and reserved; thus there was some question about his ability to handle large introductory lecture courses. No one foresaw any problems with his teaching in a small-seminar context. At dinner, Y was pleasant but spoke little and was a bit hard to get to know—however, most of us felt this would resolve in time. During my private discussion with Y, he seemed enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer him the job. He did not mention any partner/family issues. Y said our department has all the resources he needs for his research.

**Dr. Z:** Z impressed the entire search committee as a great potential hire. Based on her vita, letters of recommendation, and their own reading of her work, the search committee rated Z’s research record as “extremely strong.” Letter-writers especially noted that Z is highly creative and original in her approach to scholarship, with comments like “Z is poised to break new ground with her unique and imaginative applications of her advisor’s theory, and is sure to change how people think about her research area.” They also described Z’s impressive teaching abilities, mentioning that she was “widely considered an effective and supportive mentor by the junior graduate students and undergraduates she worked with.” She also won a teaching award in graduate school. Z’s faculty job talk/interview score was 9.5/10. At dinner with the committee, she reached out to everyone, showing herself to be very likeable, kind, and socially skilled. During our private meeting, Z was enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer her the job. She mentioned that her ex-husband will stay behind at his job and their two children will live with her. Thus she will need two slots at university daycare. Z said our department has all the resources needed for her research.

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Associate \_\_\_\_\_

Full \_\_\_\_\_

Year of Ph.D. \_\_\_\_\_

Major Field/Discipline \_\_\_\_\_

Approximately how many times have you served on a search committee to hire at the assistant professor rank? \_\_\_\_\_

Optional comments?

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THANK YOU!

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**Condition 9.1: Dr. X is a woman described in female adjective condition, 2 children and attorney husband; Dr. Y is a male foil; Dr. Z is a woman described in male adjective condition, 2 children and doctor husband, in this version she took a 12-month leave.**

Imagine you are on your department's personnel/search committee. Your department plans to hire one person at the entry assistant-professor level. Your committee has struggled to narrow the applicant pool to three short-listed candidates (below), each of whom works in a hot area with an eminent advisor. The search committee evaluated each candidate's research record, and the entire faculty rated each candidate's job talk and interview on a 1-to-10 scale; average ratings are reported below. Now you must rank the candidates in order of hiring preference. Please read the search committee chair's notes below and rate each candidate. The notes include comments made by some candidates regarding partner-hire and family issues, including the need for guaranteed slots at university daycare. If the candidate did not mention family issues, the chair did not discuss them.

**Dr. X:** X impressed the entire search committee as a great potential hire. Based on her vita, letters of recommendation, and their own reading of her work, the search committee rated X's research record as "extremely strong." Letter-writers especially noted that X is highly creative and original in her approach to scholarship, with comments like "X is poised to break new ground with her unique and imaginative applications of her advisor's theory, and is sure to change how people think about her research area." They also described X's impressive teaching abilities, mentioning that she was "widely considered an effective and supportive mentor by the junior graduate students and undergraduates she worked with." She also won a teaching award in graduate school. X's faculty job talk/interview score was 9.5/10. At dinner with the committee, she reached out to everyone, showing herself to be very likeable, kind, and socially skilled. During our private meeting, X was enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer her the job. She mentioned that her husband is a criminal defense attorney who does the type

of law in which several local firms specialize. She also said they will need two slots at university daycare for their children. X said our department has all the resources needed for her research.

**Dr. Y:** Y came across during his interview/visit as a smart, serious scholar with a solid record. Based on his vita, letters of recommendation, and their own reading of his work, the committee rated his research record as “very strong.” Y’s letter-writers all praised the “breadth and quality of his research and ideas” and described him as a “highly desirable hire among his cohort of graduate students.” They also noted that Y works on an “established set of paradigms that are sure to continue to generate publications and funding in the future.” Y’s faculty job talk/interview score was 9.3/10. One issue raised by two members of the search committee is that Y is somewhat shy and reserved; thus there was some question about his ability to handle large introductory lecture courses. No one foresaw any problems with his teaching in a small-seminar context. At dinner, Y was pleasant but spoke little and was a bit hard to get to know—however, most of us felt this would resolve in time. During my private discussion with Y, he seemed enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer him the job. He did not mention any partner/family issues. Y said our department has all the resources he needs for his research.

**Dr. Z:** Z struck the search committee as a real powerhouse. Based on her vita, letters of recommendation, and their own reading of her work, the committee rated Z’s research record as “extremely strong.” Z’s recommenders all especially noted her high productivity, impressive analytical ability, independence, ambition, and competitive skills, with comments like “Z produces high-quality research and always stands up under pressure, often working on multiple projects at a time.” They described her tendency to “tirelessly and single-mindedly work long hours on research, as though she is on a mission to build an impressive portfolio of work.” She also won a dissertation award in her final year of graduate school. Z’s faculty job talk/interview score was 9.5/10. At dinner with the committee, she impressed everyone as being a confident and professional individual with a great deal to offer the department. During our private meeting, Z was enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer her the job. She said her husband is a physician (with opportunities to practice in our area) and that they will need two slots at university daycare for their children. Z said our department has all the resources needed for her research. (Note that the search committee initially decided to limit the shortlist to candidates who all completed their training over a comparable period of time to enable direct comparisons of productivity. The committee noted that Z had one additional year compared to X and Y in which to amass her publication record, but the dean told the committee to ignore Z’s extra year because she took a 12-month maternity leave.)

Please rate each applicant using the following scale, ranging from 1 to 10:

10=truly extraordinary/exceptional

9=extremely impressive

8=high-excellent

7=low-excellent

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5=very good

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**Condition 9.2: Dr. X is a woman described in male adjective condition, 2 children and doctor husband; Dr. Y is a male foil; Dr. Z is a woman described in female adjective condition, 2 children and attorney husband. In this version she took a 12-month leave.**

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time.” They described her tendency to “tirelessly and single-mindedly work long hours on research, as though she is on a mission to build an impressive portfolio of work.” She also won a dissertation award in her final year of graduate school. X’s faculty job talk/interview score was 9.5/10. At dinner with the committee, she impressed everyone as being a confident and professional individual with a great deal to offer the department. During our private meeting, X was enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer her the job. She said her husband is a physician (with opportunities to practice in our area) and that they will need two slots at university daycare for their children. X said our department has all the resources needed for her research.

**Dr. Y:** Y came across during his interview/visit as a smart, serious scholar with a solid record. Based on his vita, letters of recommendation, and their own reading of his work, the committee rated his research record as “very strong.” Y’s letter-writers all praised the “breadth and quality of his research and ideas” and described him as a “highly desirable hire among his cohort of graduate students.” They also noted that Y works on an “established set of paradigms that are sure to continue to generate publications and funding in the future.” Y’s faculty job talk/interview score was 9.3/10. One issue raised by two members of the search committee is that Y is somewhat shy and reserved; thus there was some question about his ability to handle large introductory lecture courses. No one foresaw any problems with his teaching in a small-seminar context. At dinner, Y was pleasant but spoke little and was a bit hard to get to know—however, most of us felt this would resolve in time. During my private discussion with Y, he seemed enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer him the job. He did not mention any partner/family issues. Y said our department has all the resources he needs for his research.

**Dr. Z:** Z impressed the entire search committee as a great potential hire. Based on her vita, letters of recommendation, and their own reading of her work, the search committee rated Z’s research record as “extremely strong.” Letter-writers especially noted that Z is highly creative and original in her approach to scholarship, with comments like “Z is poised to break new ground with her unique and imaginative applications of her advisor’s theory, and is sure to change how people think about her research area.” They also described Z’s impressive teaching abilities, mentioning that she was “widely considered an effective and supportive mentor by the junior graduate students and undergraduates she worked with.” She also won a teaching award in graduate school. Z’s faculty job talk/interview score was 9.5/10. At dinner with the committee, she reached out to everyone, showing herself to be very likeable, kind, and socially skilled. During our private meeting, Z was enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer her the job. She mentioned that her husband is a criminal defense attorney who does the type of law in which several local firms specialize. She also said they will need two slots at university daycare for their children. Z said our department has all the resources needed for her research. (Note that the search committee initially decided to limit the shortlist to candidates who all completed their training over a comparable period of time to enable direct comparisons of productivity. The committee noted that Z had one additional year compared to X and Y in which to amass her publication record, but the dean told the committee to ignore Z’s extra year because she took a 12-month maternity leave.)

Please rate each applicant using the following scale, ranging from 1 to 10:  
10=truly extraordinary/exceptional

9=extremely impressive  
8=high-excellent  
7=low-excellent  
6=extremely good  
5=very good  
4=good  
3=acceptable  
2=marginally acceptable  
1=cannot support

Please rate each candidate:

X \_\_\_\_\_  
Y \_\_\_\_\_  
Z \_\_\_\_\_

Please rank each candidate:

#1 (best) \_\_\_\_\_  
#2 (2<sup>nd</sup> best) \_\_\_\_\_  
#3 (3<sup>rd</sup> best) \_\_\_\_\_

Your position:

Assistant \_\_\_\_\_

Associate \_\_\_\_\_

Full \_\_\_\_\_

Year of Ph.D. \_\_\_\_\_

Major Field/Discipline \_\_\_\_\_

Approximately how many times have you served on a search committee to hire at the assistant professor rank? \_\_\_\_\_

Optional comments?

Check here if you want the url for the website once data are available. \_\_\_\_\_

THANK YOU! ☺

## II. CARNEGIE CLASSIFICATION INFORMATION

<b>Institution</b>	<b><u>Location</u></b>	<b><u>Control</u></b>
<a href="#">Abilene Christian University</a>	Abilene, Texas	Private not-for-profit
<a href="#">Alabama A &amp; M University*</a>	Normal, Alabama	Public
<a href="#">Alabama State University*</a>	Montgomery, Alabama	Public
<a href="#">Albertus Magnus College*</a>	New Haven, Connecticut	Private not-for-profit
<a href="#">Alfred University*</a>	Alfred, New York	Private not-for-profit
<a href="#">Amberton University*</a>	Garland, Texas	Private not-for-profit
<a href="#">American InterContinental University-Online*</a>	Hoffman Estates, Illinois	Private for-profit
<a href="#">American International College</a>	Springfield, Massachusetts	Private not-for-profit
<a href="#">American Public University System*</a>	Charles Town, West Virginia	Private for-profit
<a href="#">Anderson University*</a>	Anderson, Indiana	Private not-for-profit
<a href="#">Antioch University Los Angeles*</a>	Culver City, California	Private not-for-profit
<a href="#">Antioch University New England*</a>	Keene, New Hampshire	Private not-for-profit
<a href="#">Appalachian State University</a>	Boone, North Carolina	Public
<a href="#">Arcadia University*</a>	Glenside, Pennsylvania	Private not-for-profit
<a href="#">Arkansas State University-Main Campus*</a>	Jonesboro, Arkansas	Public
<a href="#">Arkansas Tech University*</a>	Russellville, Arkansas	Public
<a href="#">Armstrong Atlantic State University*</a>	Savannah, Georgia	Public
<a href="#">Ashford University*</a>	Clinton, Iowa	Private for-profit
<a href="#">Auburn University at Montgomery*</a>	Montgomery, Alabama	Public
<a href="#">Augsburg College</a>	Minneapolis, Minnesota	Private not-for-profit
<a href="#">Augusta State University*</a>	Augusta, Georgia	Public
<a href="#">Aurora University*</a>	Aurora, Illinois	Private not-for-profit
<a href="#">Austin Peay State University*</a>	Clarksville, Tennessee	Public

<a href="#">Averett University-Non-Traditional Programs*</a>	Danville, Virginia	Private not-for-profit
<a href="#">Baker College Center for Graduate Studies*</a>	Flint, Michigan	Private not-for-profit
<a href="#">Baker University*</a>	Baldwin City, Kansas	Private not-for-profit
<a href="#">Baldwin-Wallace College</a>	Berea, Ohio	Private not-for-profit
<a href="#">Bellarmine University</a>	Louisville, Kentucky	Private not-for-profit
<a href="#">Bellevue University*</a>	Bellevue, Nebraska	Private not-for-profit
<a href="#">Belmont University*</a>	Nashville, Tennessee	Private not-for-profit
<a href="#">Bentley University*</a>	Waltham, Massachusetts	Private not-for-profit
<a href="#">Bethel University*</a>	Saint Paul, Minnesota	Private not-for-profit
<a href="#">Bloomsburg University of Pennsylvania</a>	Bloomsburg, Pennsylvania	Public
<a href="#">Boise State University</a>	Boise, Idaho	Public
<a href="#">Bradley University</a>	Peoria, Illinois	Private not-for-profit
<a href="#">Brandman University, Part of the Chapman University System*</a>	Irvine, California	Private not-for-profit
<a href="#">Brenau University*</a>	Gainesville, Georgia	Private not-for-profit
<a href="#">Bridgewater State University</a>	Bridgewater, Massachusetts	Public
<a href="#">Cabrin College*</a>	Radnor, Pennsylvania	Private not-for-profit
<a href="#">California Baptist University*</a>	Riverside, California	Private not-for-profit
<a href="#">California Lutheran University</a>	Thousand Oaks, California	Private not-for-profit
<a href="#">California Polytechnic State University-San Luis Obispo</a>	San Luis Obispo, California	Public
<a href="#">California State Polytechnic University-Pomona</a>	Pomona, California	Public
<a href="#">California State University-Bakersfield</a>	Bakersfield, California	Public



<a href="#">California State University-Chico</a>	Chico, California	Public
<a href="#">California State University-Dominguez Hills*</a>	Carson, California	Public
<a href="#">California State University-East Bay</a>	Hayward, California	Public
<a href="#">California State University-Fresno</a>	Fresno, California	Public
<a href="#">California State University-Fullerton</a>	Fullerton, California	Public
<a href="#">California State University-Long Beach</a>	Long Beach, California	Public

**Table S.3.** Carnegie Foundation’s first 50 large masters program, of which 32 do not have programs in at least 3 of the fields. Asterisked (\*).

SEE ENTIRE CARNEGIE LIST AT:

[http://classifications.carnegiefoundation.org/lookup\\_listings/srp.php?clq=%7B%22basic2005\\_ids%22%3A%2218%22%7D&start\\_page=standard.php&backurl=standard.php&limit=0,50](http://classifications.carnegiefoundation.org/lookup_listings/srp.php?clq=%7B%22basic2005_ids%22%3A%2218%22%7D&start_page=standard.php&backurl=standard.php&limit=0,50)

### III. FULL ENGINEERING CVs USED IN EXPERIMENT 4

Counterbalanced by candidate gender and order of presentation (i.e., each vita was sent out both as a woman's vita and alternatively as a man's vita to different faculty members; the order in which vitae were presented was alternated). Thus, there were four versions—a given vita appearing first and portrayed as belonging to either a man or a woman, then in the next two versions, that same vita appearing last and portrayed as belonging to either a man or a woman.

#### *Candidate X*

##### **EDUCATION BACKGROUND**

PhD, Aerospace Engineering, May 2012

Keck Institute for Space Studies, *California Institute of Technology*

Topic: Granular Mechanics, Physics

Topic: Orbital Mechanics (focused on the influence of cohesive and electrostatic forces on the motion of dust particles)

B.S., Aerospace Engineering

Highest Honors

Georgia Institute of Technology, May 2008

My work has been presented at several conferences and in journal papers. Awarded the NASA Earth and Space Science Fellowship, and received honorable mention for the NSF Graduate Researcher Fellowship.

##### Research and Work Experience:

July 9, 2011 – Present

- Quantitative modeling of interaction of regolith with the sample sieving device on the Mars Science Lab rover. Jet Propulsion Lab.

##### Honors:

- NASA Earth and Space Science Fellowship Recipient 2009, 2010, 2011
- Keck Fellowship Awardee 2012
- Institute for Space and Astronautical Sciences (JAXA).
- NSF Graduate Researcher Fellowship Program Honorable Mention 2009
- Dissertation explored electrostatic and cohesive effects of surface dynamics of asteroid dust particles

##### Principal Investigator

*National Science Foundation / Institute of Space and Astronautical Science (JAXA)*. Research conducted at JAXA

##### Publications:

**CANDIDATE X**, Smith, A., Johnson, R. *Geophysical Research Letters*. Submitted.

**CANDIDATE X**, Johnson, R. *Journal of Geophysical Research*. Accepted.

**CANDIDATE X**, Rivers, S. *Planetary and Space Sciences*. 2012. Vol 61, pp 758-768.

Rivers, S., Peterson, M., Sweeney, C., **CANDIDATE X**, *Icarus*. 2011. Vol 210, pp 468-484.

Johnson, R., **CANDIDATE X**, Smith, A. *The Astronomical Journal*. 2010. Vol 142, pp 107-122.  
**CANDIDATE X**, Smith, A. *Journal of Geophysical Research*. Accepted.

*Conference Presentations:*

**CANDIDATE X** et al. NASA Lunar Science Forum. July 2012.  
Rivers, S., Peterson, M., **CANDIDATE X**, Atmosphere and Plasma. June 2012.  
**CANDIDATE X**, et al. Workshop on the Physics of Dusty Plasmas. 2012.  
**CANDIDATE X**, et al. *Asteroids, Comets and Meteors*. May 2012.  
**CANDIDATE X**, IEEE Aerospace Conference. March 2012.  
Rivers, S., Peterson, M., **CANDIDATE X**, American Geophysical Union Fall Meeting. December 2011. Poster.  
Smith, A., Lee, R., **CANDIDATE X**, Div. of Planetary Sciences (AAS) Conference. 10/2011.

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**Candidate Y**

**EDUCATION BACKGROUND**

University of Colorado, Boulder, CO, USA  
School of Engineering and Applied Science  
PhD, Mechanical and Aerospace Engineering, September 2012

B.S. Cornell University, Ithaca, NY USA  
Sibley School of Mechanical and Aerospace Engineering, Cornell University  
M. Eng, Aerospace Engineering, January 2007

Major Area: Dynamics and Controls

Honors:

- Wu Prize for Excellence, Fall 2011
- Visiting Graduate Fellow, Lawrence Livermore National Laboratory September 2012
- Dean's list, Cornell University
- American Astronomical Society Predoctoral Fellowship, 2010
- National Merit Scholarship, September 2002 - May 2006

Publications:

1. **CANDIDATE Y**, Bruner, J., Kagan, G., ApJ, 728, 66, 2011.
2. Andrews, S. M., Benson, E. A., Greene, O., Falcone, B., **CANDIDATE Y**, Icarus, 210, 2, 2010.
3. **CANDIDATE Y**, Frawly, W., PASP, 122:401419, 2010.
4. **CANDIDATE Y**, Ferber, W., Martin, B., Geophys. Res., 111, E06018, 2006.
5. Uphoff, M., Ferber, W., **CANDIDATE Y**, Geophys. Res., 111, E02S03, 2006.

Conference Presentations:

1. **CANDIDATE Y**, et al. Proc. SPIE 8447, 84476S, 2012.
2. Uphoff, M., Ferber, W., Martin, B., **CANDIDATE Y**, Proc. SPIE 8442, 84420A, 2012.
3. **CANDIDATE Y**, Andrews, S. M., Benson, E. A., Greene, O., Falcone, B. and Seransky, D., Proc. SPIE 8447, 84470P, 2012.
4. **CANDIDATE Y**, Ferber, W., Martin, B., AAS Meeting #219, #155.12, 2012.

5. Uphoff, M., Ferber, W., **CANDIDATE Y.**, AAS Meeting #217, #318.02, 2011.

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## **CANDIDATE Z**

### **EDUCATION BACKGROUND**

- **Ph.D. in Aerospace Engineering, 2012**

The University of Michigan – Ann Arbor

Thesis: *Nonlinear Trajectory Navigation*

- **B.S. in Aerospace Engineering and Minor in Mathematics, 2001**

Georgia Institute of Technology

### Research and Work Experience:

2012–Present

- Jet Propulsion Lab. California Institute of Technology

### Honors:

- NASA predoctoral fellowship
- *AAS/AIAA Finalist*
- *2012 NSF Travel grant*
- 2011 Dawn Navigation Team Award / JPL MEGA Award
- 2010 Selene Navigation Team Award
- 2009 University of Michigan Rackham Harold and Vivian Shapiro Awards

### Publications:

1. **CANDIDATE Z**, et al. *Space Science Reviews*, 2012. Accepted
2. **CANDIDATE Z**, et al. submitted to *Icarus*, Jan. 2013.
3. **CANDIDATE Z**, et al. *Journal of Spacecraft and Rockets*, 49(2), 2013.
4. **CANDIDATE Z**, Williamson, E., Fabian, B. *Geophysical Research Letters*, 38, L24202, 2012.
5. Scottoline, R., **CANDIDATE Z**, Selinski, S. *Journal of Guidance, Control, and Dynamics*, 35(4): 612-621, 2010.
6. Scottoline, R., Brown, A., Williamson, E., Fabian, B., **CANDIDATE Z**. *Physical Review D*, 69(4), 042001, 2012.

### Conference Presentations:

1. **CANDIDATE Z**, paper to be presented at the 44th *Lunar and Planetary Science Conference*, 2013.
2. **CANDIDATE Z**, paper to be presented at the *2013 AAS/AIAA Space Flight Mechanics Meeting*, Kauai, Hawaii, February 10-14, 2013.
3. Williamson, E., Fabian, B., **CANDIDATE Z** et al., paper presented at the *2012 European Planetary Science Congress*, September 23-28, 2012.
4. Williamson, E., Fabian, B. **CANDIDATE Z**, paper presented at the *43rd Lunar and Planetary Science Conference*, March 19-23, 2012.
5. **CANDIDATE Z** et al., paper presented at the *2011 AAS/AIAA Space Flight Mechanics Meeting*, New Orleans, Louisiana, February 13-17, 2011, AAS-11-203.
6. **CANDIDATE Z**, paper presented at the *2009 AAS/AIAA Astrodynamics Specialist Conference*, Pittsburgh, Pennsylvania, August 9-13, 2009, AAS-09-408.

7. Williamson, E., Fabian, B., **CANDIDATE Z**, poster presented at AGU Fall Meeting 2011, San Francisco, California, December 2011.

\*\*\*\*\*

**PLEASE RANK EACH CANDIDATE:**

#1 (best) Z

#2 (2<sup>nd</sup> best) Y

#3 (3<sup>rd</sup> best) X (Although this candidate may have the “best” qualifications, his research area does not fit well within our department)

Your position:

Assistant \_\_\_\_\_

Associate X

Full \_\_\_\_\_

Year of Ph.D. 1999

Approximately how many times have you served on a search committee to hire at the assistant professor rank? 3

Optional comments?

Check here if you want the url for the website once data are available. \_\_\_\_\_

THANK YOU!

(201311)

#### IV. MATERIALS FOR EXPERIMENT 5

Materials were sent out in counterbalanced manner—the “female” candidate narrative summary was sent out half to male faculty and half to female faculty, and vice versa for the identical (except for gender pronoun) “male” candidate narrative summary.

##### *Male Applicant Version*

Imagine that your department has an opening for one person at the entry-assistant-professor level and the faculty may want to hire someone this year. Below is a profile of one candidate on the short list. This individual works in a hot area with an eminent advisor. The search committee evaluated the research record of all applicants, and the entire faculty rated each short-listed-candidate’s job talk and interview on a 1-to-10 scale. Please read the search committee chair’s notes below and provide your evaluation.

##### **Search Committee Chair’s Notes:**

**Dr. X** impressed the entire search committee as a great potential hire. Based on his vita, letters of recommendation, and their own reading of his work, the search committee rated X’s research record as “extremely strong.” Letter-writers especially noted that X is highly creative and original in his approach to scholarship, with comments like “X is poised to break new ground with his unique and imaginative applications of his advisor’s theory, and is sure to change how people think about his research area.” They also described X’s impressive teaching abilities, mentioning that he was “widely considered an effective and supportive mentor by the junior graduate students and undergraduates he worked with.” He also won a teaching award in graduate school. X’s faculty job talk/interview score was 9.5/10. At dinner with the committee, he reached out to everyone, showing himself to be very likeable, kind, and socially skilled. During our private meeting, X was enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer him the job. He mentioned that he is single with no partner/family issues. X said our department has all the resources needed for his research.

##### **Please rate this candidate using the following 1-to10 scale:**

- 1=Cannot support candidate.
- 2=Marginally-acceptable candidate/I am not enthusiastic.
- 3=Acceptable candidate/perhaps we can do better?
- 4=Good candidate/pursue if resources allow.
- 5=Very good candidate/I am enthusiastic about hiring this person.
- 6=Excellent candidate/I am very enthusiastic about hiring this person.
- 7=Extremely impressive candidate/offer all typical recruitment incentives.
- 8=Outstanding candidate/recruit if possible; go beyond typical incentives.
- 9=Superb candidate/work hard to recruit this person; use every possible incentive.
- 10=Truly extraordinary/exceptional candidate--rare opportunity/do whatever it takes to recruit this person using any and all incentives.

**Your rating of Dr. X:** \_\_\_\_\_

### Why? (Optional)

Your position:

Assistant \_\_\_\_\_

Associate \_\_\_\_\_

Full \_\_\_\_\_

THANK YOU!!

### *Female Applicant Version*

Imagine that your department has an opening for one person at the entry-assistant-professor level and the faculty may want to hire someone this year. Below is a profile of one candidate on the short list. This individual works in a hot area with an eminent advisor. The search committee evaluated the research record of all applicants, and the entire faculty rated each short-listed-candidate's job talk and interview on a 1-to-10 scale. Please read the search committee chair's notes below and provide your evaluation.

**Dr. X** impressed the entire search committee as a great potential hire. Based on her vita, letters of recommendation, and their own reading of her work, the search committee rated X's research record as "extremely strong." Letter-writers especially noted that X is highly creative and original in her approach to scholarship, with comments like "X is poised to break new ground with her unique and imaginative applications of her advisor's theory, and is sure to change how people think about her research area." They also described X's impressive teaching abilities, mentioning that she was "widely considered an effective and supportive mentor by the junior graduate students and undergraduates she worked with." She also won a teaching award in graduate school. X's faculty job talk/interview score was 9.5/10. At dinner with the committee, she reached out to everyone, showing herself to be very likeable, kind, and socially skilled. During our private meeting, X was enthusiastic about our department, and there did not appear to be any obstacles if we decided to offer her the job. She mentioned that she is single with no partner/family issues. X said our department has all the resources needed for her research.

**Please rate this candidate using the following 1-to10 scale:**

**1**=Cannot support candidate.

**2**=Marginally-acceptable candidate/I am not enthusiastic.

**3**=Acceptable candidate/perhaps we can do better?

**4**=Good candidate/pursue if resources allow.

**5**=Very good candidate/I am enthusiastic about hiring this person.

**6**=Excellent candidate/I am very enthusiastic about hiring this person.

**7**=Extremely impressive candidate/offer all typical recruitment incentives.

**8**=Outstanding candidate/recruit if possible; go beyond typical incentives.

**9**=Superb candidate/work hard to recruit this person; use every possible incentive.

**10**=Truly extraordinary/exceptional candidate--rare opportunity/do whatever it takes to recruit this person using any and all incentives.

**Your rating of Dr. X:** \_\_\_\_\_

**Why? (Optional)**

Your position:

Assistant \_\_\_\_\_

Associate \_\_\_\_\_

Full \_\_\_\_\_

THANK YOU!!



## V. EVIDENCE FOR CLAIMS OF HIRING BIAS

***Does Anyone Really Claim That Biased Hiring Causes the Underrepresentation of Women?*** One might wonder if the claim of sex bias in hiring is a “straw man”, as one of the reviewers of this study opined. Does anyone believe that women are discriminated against in academic hiring and that this is the cause of their dearth? And if so, how can we reconcile such a belief with claims by search committee members that they exercise due diligence (and often more) when it comes to giving serious attention to female and URM applicants?

To take the first part of this question, the answer is an unequivocal yes. There is a frequently-expressed belief that women are the victims of hiring bias, not just in the past when there may be evidence of bias, as Irvine pointed out (1996), but also in the present when the evidence is either lacking or runs in the opposite direction. Numerous commentators have asserted that women face an uphill battle in the academy, including, but not limited to, being invited to interview and hired. Although other barriers are invoked, such as chilly climate, delayed promotion, difficulty balancing work-family, and inequitable salaries, commentators often view the combination of lower numbers of applications from female candidates coupled with anti-woman hiring bias as an important part of the reason for the underrepresentation of women in the academy. Consider:

“It is well-established that the presence of a male or female name on a CV has a strong effect on how that CV is evaluated... In Steinpreis et. al.’s US study, 238 academic psychologists (118 male, 120 female) evaluated a curriculum vitae randomly assigned a male or a female name. Both male and female participants ... were more likely to hire the male than the female applicant” (Jennifer Saul, 2012).

“It is now recognized that (sex) biases function at many levels within science including funding allocation, employment, publication, and general research directions” (Lortie et al., 2007, p. 1247).

“These experimental findings suggest that, contrary to some assertions, gender discrimination in science is not a myth. Specifically, when presented with identical applicants who differed only by their gender, science faculty members evaluated the male student as superior, were more likely to hire him, paid him more money, and offered him more career mentoring” (Moss-Racusin, C. Commentary and Analysis from SPSP.org September 21, 2012 <http://spsptalks.wordpress.com/2012/09/21/arescience-faculty-biased>).

“Research has pointed to (sex) bias in peer review and hiring. For example, a female postdoctoral applicant had to...publish at least three more papers in a prestigious science journal or an additional 20 papers in lesser-known specialty journals to be judged as productive as a male applicant...The systematic underrating of female applicants could help explain the lower success rate of female scientists in achieving high academic ranks” (American Association of University Women: Hill, Corbett, & Rose, 2010, p. 24).

Haslanger provides a table with percentages of women among the faculty of the top 20 graduate programs in philosophy in the U.S., ranging from 4% to 36%, and she concludes that “the data mostly speak for themselves” (2008, p. 214)...and claims that when she was a graduate student

there was “a lot of outright discrimination” and that “blatant discrimination has not disappeared” (p. 211). Haslanger, S. (2008) ‘Changing the Ideology and Culture of Philosophy: Not by Reason (Alone)’, *Hypatia* 23:2, 210-223.

“Psychological research has shown that most people-- even those who explicitly and sincerely avow egalitarian views-- hold what have been described as implicit biases ... There are countless situations in which such mechanisms are triggered: classroom situations, hiring committees, refereeing of papers for journals, distribution of departmental tasks (research, teaching, admin.) etc.” Oct. 2, 2010 at <http://www.newappsblog.com/2010/10/implicit-biases-1.html>

“We are not proposing that gender-blind searches are the only answer (to hiring more women and URMs). We see these as one piece of a larger effort that also involves bias-avoidance training, gender-blind reviews, salary equity adjustments, and a clear examination of bias in the promotion of female professionals.” (Jones & Urban, 2013, p. 612-613)

“Women and minorities must both deal with implicit bias, a problem that is well documented in the social science literature ... Donna Dean (President of the Association for Women in Science) describes the problem of implicit bias in these terms: ‘People are most comfortable with people who think and look like themselves.’” Powell, K. (2007). Beyond the glass ceiling. *Nature*, 448, p. 99.

Numerous blue-ribbon panels and national reports have concluded that implicit and sometimes explicit biases pervade the hiring process and negatively influence evaluations of female candidates and their scholarship, contributing to women’s underrepresentation within the academy, as asserted by the 2014 AAUP report by “inadvertently foreclosing consideration of the best-qualified persons by untested presuppositions which operate to exclude women and minorities.” (<http://www.aaup.org/report/affirmative-action-plans-recommended-procedures-increasing-number-minority-persons-and-women>)

Thus, the claim of sex bias in the evaluation of females has been front and center in the national debate over women’s underrepresentation in some STEM fields. This is often coupled with the finding that a smaller fraction of women than men decide to apply for tenure-track positions, as we noted in the Conclusion to the main paper. Countless universities around the U.S. have invested resources to create gender-fair recruitment, hiring, and training. For example, Jones and Urban (41) describe the steps undertaken by the Ecology and Evolutionary Biology Department at the University of Connecticut in an attempt to reduce unconscious bias against female and URM applicants for a tenure-track assistant professor position: “*Simply discussing unconscious bias heightened our sensitivity. To further protect our decisions from deeply buried biases that conscious effort could not root out, we decided to try an initial blind review of the applications*” (p. 612).

Applications to their department were gender-blinded by the administrative staff so that gendered pronouns, first names, titles of awards, etc. were redacted from application materials and letters of references before faculty search committee members ranked them prior to determining the final short-list. Their efforts were nothing short of heroic and they vividly document the lengths to which

universities strive to counter presumed sex bias in hiring. In these authors' words,

The redaction involved more than 100 hours of monumental effort by our departmental administrative assistant, but in the end, unfortunately, it failed to conceal gender in many of the applications. Just one overlooked pronoun, or an uncommon gender-revealing word (e.g., *guy*) exposed gender, and with so many redactions needed in each file, it was difficult to detect them all. Some committee members noticed that just the size of the redacted area in the document revealed gender, because *he* requires fewer character spaces than *she*. In addition, redactions were done on PDFs, but if phrases from the PDFs were copied and pasted into a summary spreadsheet, the PDF redactions were revealed... individual search committee members tried to guess the gender of the applicant after ranking them. Excluding redaction errors, the search committee members guessed gender correctly 67% of the time (range: 59%–85%) on average. Three of the four search committee members did not guess gender significantly better than would be expected from random chance. The fourth guessed gender significantly more than would be expected from random chance after recognizing telling variations in pronoun lengths in the redacted letters... We are not proposing that gender-blind searches are the only answer (to avoiding “deeply buried biases”). We see these as one piece of a larger effort that also involves bias-avoidance training, gender-blind reviews, salary equity adjustments, and a clear examination of bias in the promotion of female professionals. (p. 612-613)

Our own university has periodically urged faculty to attend a workshop in which a video depicts a chauvinistic search committee member thwarted by more enlightened members of the search committee in his sexist effort to hire an inferior male applicant over a superior female applicant. The predicate for such training is that sexism manifests itself in talented female applicants being passed over by search committees in favor of less talented male applicants. Here is an email sent to all faculty at our university:

### **Effective Search Practices I: It Depends on the Lens**

Dear Colleagues:

We would like to invite you to an event on Monday, September 23, 2013 when the Provost's Office of Faculty Development and Diversity and the Cornell Interactive Theatre Ensemble will conduct a session for faculty titled "**Effective Search Practices I: It Depends on the Lens.**" If your department plans to conduct a search this year, representation from the search committees is critical (unless committee members have already attended this workshop in the past). Any faculty member who might participate in the search process is also highly encouraged to attend the workshop. Even if no immediate searches are anticipated in your department, the workshop will prove very helpful for chairs and faculty for future searches. The workshop includes:

- A filmed scenario of a faculty search committee meeting in progress, reviewing potential candidates for on-campus interviews
- A conversation with the search committee chair
- A facilitated discussion about participants' reactions to the scenario
- A short presentation on the body of social science research that underlies the dynamics of the conversation presented in the scenario, and
- A list of tools and strategies for conducting an effective search

Although in the historic literature there are articles noting that fear of having their application rejected was not a prominent reason for women's lower application rates compared with men's, there are many articles that have argued the underrepresentation of women in faculty positions is the result of hiring and promotion bias. The size of this latter camp is very large (see, e.g., Ceci, Ginther, Kahn, & Williams, in press, *Psychological Science in the Public Interest*). This claim of bias has penetrated the popular media as well. A recent illustration of the anti-woman bias claim can be found in the October 8, 2013 *US News & World Report*, the headline reads:

### **STEM Roundup: Bias, Not Babies, Hamper Women in STEM**

[http://www.usnews.com/news/stem-solutions/articles/2013/10/08/stem-roundup-bias-not-babies-hamper-women-in-stem?s\\_cid=rss:stem-roundup-bias-not-babies-hamper-women-in-stem](http://www.usnews.com/news/stem-solutions/articles/2013/10/08/stem-roundup-bias-not-babies-hamper-women-in-stem?s_cid=rss:stem-roundup-bias-not-babies-hamper-women-in-stem)

Another recent illustration of the bias claim appears in a *New York Times Sunday Magazine* article by Eileen Pollack, Oct. 3, 2013, who writes that the underrepresentation of women in math-intensive fields is due—at least in part—to male underestimations of women's competence and that this is why they are not hired for tenure-track jobs. For example, she quotes a mathematics professor at Yale about his explanation for the shortage of female math professors there: “I guess I just haven't seen that many women whose work I'm excited about.” This position was promulgated by many of the >1,000 posts. <http://www.nytimes.com/2013/10/06/magazine/why-are-there-still-so-few-women-in-science.html>

To recap, it has become increasingly common for the claim to be made that female applicants, notwithstanding their smaller fraction who opt to apply for tenure-track positions in the first place, are undervalued in a range of evaluative contexts, including tenure-track hiring. Universities across the U.S. have implemented training to combat presumed sex bias in hiring, devoting resources to establishing offices and initiatives. We do not deny that biases of various sorts existed against female applicants in the past (there are documented cases of buildings lacking women's bathrooms, and faculty meetings extending beyond pick-up times for preschools), and that biases and other challenges may continue to exist and act to impede women's attempts to balance work and family. However, the present study, the largest and best sampled so far, suggests that the assertion that women applicants for tenure-track assistant professorships are passed over in favor of less qualified men is lacking empirical support. In our study, women applicants were favored over identically-qualified men, roughly by a margin of 2-to-1. Thus, while other forms of bias may still exist it seems time to move past the single most important juncture in the academic lifecourse, interviewing and hiring for tenure track positions.

One reviewer for this journal noted that these results will not be embraced by everyone—particularly male applicants. The twin goals of gender-blind evaluation and increasing faculty diversity are worthy of a national dialogue by professional societies and science policy makers. We ourselves can see merit in all sides in such a discussion. What we cannot see merit in, however, is the continued assumption that search committees are bypassing female candidates in favor of less talented male candidates. If this is truly the case, then far better empirical evidence is needed than has been invoked in testimonials.

## VI. Describing Applicants in Gendered Language Might Influence Academic Science Hiring

PUBLISHED IN *AMERICAN SCIENTIST*, MAY 7, 2015:

<http://www.americanscientist.org/blog/pub/gendered-language-science-hiring>

Wendy M. Williams and Stephen J. Ceci

FIRST IMAGE:

<http://www.gettyimages.com/detail/news-photo/american-gothic-grant-wood-table-the-1930-chicago-art-news-photo/89862256>

CAPTION:

Traditional sex roles have give rise to different types of adjectives for describing women and men. Prevailing wisdom is that female profiles limit women's success in STEM fields. But new research provides some complexity to that story.

In 2012, we wrote a feature article for *American Scientist* titled “When Scientists Choose Motherhood” (<http://www.americanscientist.org/issues/pub/when-scientists-choose-motherhood>).

That feature focused on how women academics could have children without being penalized on their way to tenured positions. In our subsequent work, one area we have studied is the hiring practices academics face when attempting to obtain a professorship.

We recently published an article

(<http://www.pnas.org/content/early/2015/04/08/1418878112.abstract>) about the results of a 4.5-year program of research on gender’s influence on faculty hiring preferences for tenure-track STEM assistant professorships. (For additional discussion, see this post.)

([http://www.huffingtonpost.com/wendy-m-williams/women-scientists-academic-hiring-advantage-is\\_b\\_7195312.html](http://www.huffingtonpost.com/wendy-m-williams/women-scientists-academic-hiring-advantage-is_b_7195312.html)). This research described five national experiments involving 873 faculty at 371 universities and colleges. This study found a 2:1 faculty preference for hiring women on the STEM tenure track. In four of the five experiments, ratings were based on narrative summaries, authored by a search-committee chair, which reviewed applicants’ credentials, interviews, and job talks. Our methods brought up an interesting issue about the types of adjectives used to describe job applicants, one that we did not have space to address in the paper.

(embed video here: <https://www.youtube.com/watch?v=5f6rQfpd68o>)

We asked faculty to evaluate three hypothetical applicants for a professorship in their department, informing them that their search committee had rated two of the applicants as “extremely strong” (9.5/10) and the third as slightly weaker (9.3/10), but still “very strong.” Faculty were informed that this rating was established from their search committee’s evaluation of the applicants, based on their CVs and letters of recommendation, hearing their job talks, and meeting with them. In four of five experiments, faculty were not directly given CVs to examine, but rather these narrative summaries. Because this method differs from how professorial hiring is usually done, some have argued that if we had used CVs and set up actual applicant interviews, we might not have found a preference for hiring women. However, this was not the goal of our experiments. Based on eight published real-world hiring audits—not experiments but actual hiring data about who applies for professorships and who gets hired—it had been documented long before we did our study that actual hiring

decisions in the real world show a preference for women. These audit studies, which were cited in our article, have shown that although fewer women apply for tenure-track professorships, those who do apply have a higher chance of being hired than their male competitors. (Of course, of the large number of applicants competing for these positions, the total percentage of applicants who are hired is small, so the vast majority of both women and men applicants are not hired). The goal of our recent experiments was to determine whether women are preferentially hired because the women who apply are stronger than their male competitors (as has been alleged). Thus, we needed to make the man and woman candidates identically strong—impossible to accomplish in an actual hiring context.

CVs are important when comparing applicants in a single, narrow field, but they are problematic when evaluating applicants across multiple fields and different types of institutions--both of which were important considerations because we wanted to generalize our findings to a broad swath of American universities. In the online supplement to our article we discussed why CVs are problematic. Academic fields and institutions differ substantially from one another in what they consider “excellent” in terms of number of publications and type of scholarship. The same applicant’s CV viewed as excellent at a doctoral-intensive institution may be viewed differently at a small teaching-intensive college, and vice versa. Even within a single field there can be large differences in how the same CV is rated, which we discussed in our article (e.g., some subfields within a discipline are more positive about conference proceedings than are other subfields; in our field, some subfields expect 2-3 times more publications than others). Thus, we converted CVs to summaries that did not explicitly state the number or type of publications, but instead used phrases such as: *“Based on her vita, letters of recommendation, and their own reading of her work, the search committee rated X’s research record as extremely strong...She was rated 9.5 on a 10-point scale.”*

In one experiment, we did give 35 engineering faculty from a single subfield (mechanical) real CVs, and just like in the other four experiments in which we used summaries, they preferred the woman’s CV over the identical CV with a man’s name on it. Indeed, the pro-female preference of these 35 mechanical engineering professors went from 2-to-1 to nearly 3-to-1 when actual CVs were used, which is trending higher than the pro-female preference exhibited by mechanical engineering professors who received summaries rather than CVs. So, yes, our experiments did not mimic the hiring context that departments use to select professors but, as we noted, it was not our intent to find out if faculty preferred women applicants because we knew from the published audit studies that they did. Our goal was to determine if this preference was due to women applicants being stronger than men, as has been alleged. We discovered that this preference extended to situations in which the male and female applicants were equivalently strong—thus, women did not need to be stronger than men to be preferred.

Article-length constraints prevented us from describing in detail some issues not central to our study. We discuss one such issue here, because it is interesting in its own right and because numerous commentators have raised it in an attempt to erroneously dismiss our findings. We refer to the use of gendered personalities to disguise the central purpose of the experiments. We did not want faculty to think, “I know what this study is about—they want to know if I am a sexist when it comes to hiring.” Such awareness could prompt faculty to make politically-correct responses not

resembling their true feelings. Our strategy was to describe each of the three finalists differently, while holding constant the academic accomplishments of the top two.

So, we systematically portrayed candidates of both sexes in various ways, differing in personality and lifestyle, just as candidates differ in the real world. The lifestyles included single with no children, married with children and stay-at-home spouse, married with children and a spouse who works outside the home, and divorced with children. In every contest between the three finalists, these lifestyles were varied, but, importantly, they were completely counterbalanced across faculty raters so that for every case of a woman depicted in one lifestyle, there was a man depicted in the same lifestyle who was evaluated by a different faculty member. We also varied personality attributes to disguise the purpose of the experiments. The personalities were built around adjectives found in past research to characterize traditionally “female” versus “male” personalities: “imaginative, highly creative, socially skilled, kind, likeable” for women versus “analytical, ambitious, independent, stands up under pressure, powerhouse” for men. (For list of male and female adjectives, including those used in our experiments, see Appendix A in this paper.) (<http://psp.sagepub.com/content/26/10/1171.short>)

We also counterbalanced these adjective descriptors so that in half of our materials, the female profile was used for a female candidate and in the other half, the female profile was used for a male candidate, and vice versa. By counterbalancing, we ensured that effects of each version of our results were countered by effects of the opposite version. This meant that our results, which described overall average hirability for each gender, were not influenced unfairly by the gender of adjectives used to disguise the purpose of the study. We checked statistically to ensure that this was the case: There were no interactions between faculty-rater gender and adjective gender which, had they existed, would have created effects in different directions for different subgroups and thus complicated the interpretation of the data.

Most people reading our study are not psychologists, so they may not be familiar with the statistical predictions that follow from our “nested” experimental design, which portrayed two main contests: man/male adjectives vs. woman/female adjectives, and man/female adjectives vs. women/male adjectives. (The design was by necessity nested, because it makes no conceptual sense to have a contest between two applicants described with identical personalities.) Our study revealed an overall 2:1 preference for women candidates over men, averaged across experimental conditions. In the real world, candidates may have some traits that are preferred during hiring and others that are not. Our experiment reflected this reality.

Imagine you are hiring a recent high school graduate and there are two people on your shortlist—a graduate from East High and one from West High. East High is a better school that produces generally more skilled graduates; West High is not nearly as good. So, if the candidate from East happens also to be highly motivated and enthusiastic with the personality you seek, and the candidate from West happens to have a personality you do not like (i.e., not particularly motivated or enthusiastic), the contest is between a person with a double dose of what you seek versus a person with a double dose of what you do not want. (Note that being motivated and enthusiastic helps all candidates of both genders in this analogy.) The choice of whom to hire is simple. If, however, the candidate from East happens to have a personality you do not like, and the candidate from West has a personality you really do like, the contest can be difficult to resolve—neither



choice is ideal, because each candidate has something you do not want combined with something you do want. It will depend on the weight you attach to each.

The statistical prediction in this case is for a strong preference for candidates from East High with the preferred personality, and a strong preference against candidates from West with the disliked personality. The graduates from East with the disliked personality and those from West with the desired personality each have one positive and one negative attribute influencing the hiring decision; thus, they come out in the middle with regard to hirability.

This situation is exactly what we found in our hiring-preference studies. There were two main effects, each strongly favoring women candidates and female traits. When a candidate had both of these attributes (in the same contest)—a woman with female persona (such as socially-skilled, creative), competing against a man with male persona (such as powerhouse, analytical), the woman with female persona was picked 80.4 percent of the time, and the man only 19.6 percent of the time. This preference for women depicted with female adjectives may be seen by some as surprising in view of the finding that women depicted with female adjectives fare poorly when competing for leadership positions or in traditional male domains (see, for instance, this paper <http://hum.sagepub.com/content/64/12/1555.abstract> or this one <http://www.ncbi.nlm.nih.gov/pubmed/15161402>). Clearly more research needs to be done on this issue, as it was not a focus of our experiments; we used gendered adjectives simply as a disguise for the real purpose of the study, which was to examine whether faculty rated women higher than identically-qualified men. The use of other adjectives might have resulted in different outcomes.

In the intermediate conditions in the opposite contest, candidates with one “positive” attribute (female gender) and one “negative” attribute (male personality), competing against a man (“negative” attribute) with female personality (“positive” attribute), women and men applicants were at parity. Overall, women’s average chance of being picked was 67 percent, which ranged in specific matching-lifestyle conditions from 80.4 percent to statistical parity (50.7 percent). Men’s chance of being picked ranged from 19.6 percent to statistical parity (49.3 percent). Men never had an advantage over women in any matched-lifestyle contrast in our experiment. As expected, a candidate with both the female gender and female personality that respondents preferred was overwhelmingly chosen by faculty in our study, whereas female candidates with male personalities that respondents found undesirable were downgraded when they competed against men with female personalities, who were upgraded. Again, the counterbalancing of conditions throughout our studies meant that the reported results averaged across these two hiring contests, as well as across different lifestyles, and thus did not account for the results (For more information, see our website <http://www.human.cornell.edu/hd/ciws/index.cfm>).

SECOND IMAGE:

<http://www.gettyimages.com/detail/news-photo/dustin-hoffman-at-tootsie-premiere-news-photo/110559645>

CAPTION: The 1982 film *Tootsie*, starring Dustin Hoffman, used comedy to examine bias against women and challenges to gender roles. Traditional descriptors of both men and women, and how that language affects workplace advancement, remain a complex topic of study.



In the real world, candidates for tenure-track jobs have both a gender and a personality. Our results reveal that the female gender is a substantial advantage at 67 percent overall. In our study, the male gender coupled with the male personality—at least as captured by the handful of male adjectives that were used—is a huge impediment (preferred only 19.6 percent of the time), when the alternative is a woman with female traits—at least those we used (preferred 80.4 percent of the time). To interpret our results, one must remember that there are two types of contests, described above. The data match the interpretations of two strong and highly preferred female traits—actually being a woman, and being described with adjectives connoting a “female” persona. Note also that in one of our experiments, we asked faculty to rate just one candidate, male or female, depicted always with the female personality. Thus, we held adjective-gender constant, and as we might have expected from our other data, the substantial main effect of female gender resulted in a significant preference for hiring the woman over the man, who was identical in credentials except for the use of pronouns “he” versus “she.” And, in a validation, the same female preference again emerged when both of these candidates were described with male personalities.

Readers should remember that gendered personalities (adjectives) were used to disguise the real purpose of the study and were fully counterbalanced and thus had no bearing on our overall results, which were expressed as averages across multiple systematically varied conditions. Our national study was not designed explicitly to evaluate gendered adjectives or gender congruity versus incongruity, which are interesting topics in their own right—we used samples of adjectives representing some of many that might be used in further work.

What do our findings mean in practical terms? Most male PhD-holders on the job market do not plan to switch to the female gender. But, to the extent that new PhDs of either gender can use traditionally “female” adjectives in their job applications, this preliminary work suggests that such traits may confer some advantage. We hesitate to over-interpret this conclusion because it is based on a single study, and it was not the purpose of our study to test adjectives but merely to use a sample of them, shown in past research to have gender connotations, to disguise the real purpose of our experiments. For faculty writing letters of recommendation, the message might be to include female adjectives when describing candidates of either gender. But first, research dedicated to thoroughly exploring gendered adjectives as influences on faculty hiring should be undertaken. In ongoing research, we are continuing to explore the roles of personality in greater detail to provide additional information into the various real-world contexts influencing hiring preferences.

*Editor’s Note: American Scientist welcomes all responses that contribute constructively to the conversation about this research.*

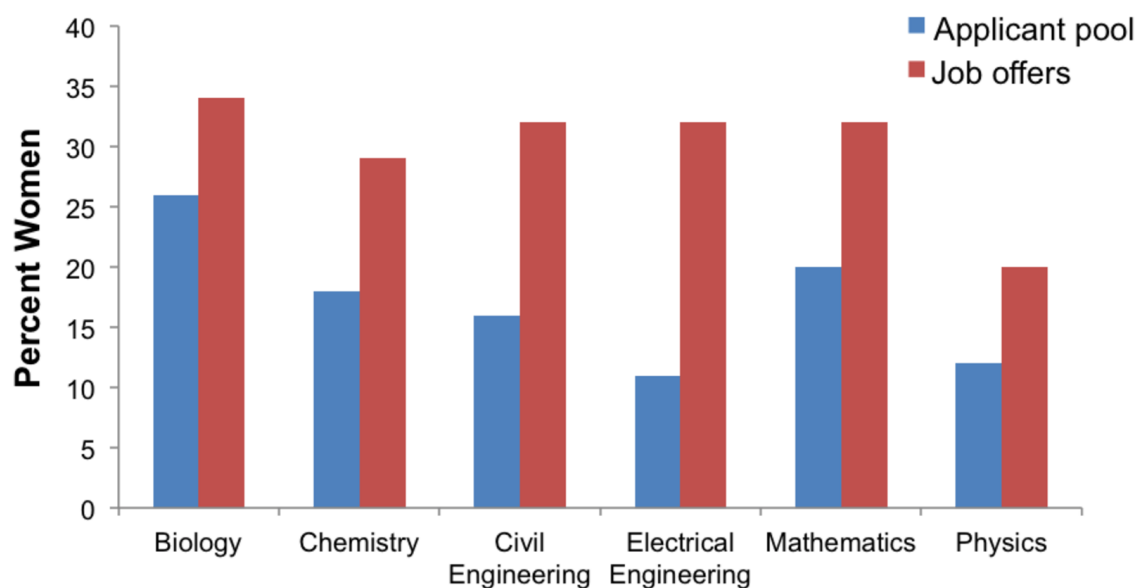
## VII. WOMEN SCIENTISTS' ACADEMIC-HIRING ADVANTAGE IS UNWELCOME NEWS FOR SOME, PART 1

PUBLISHED IN *THE HUFFINGTON POST*, MAY 1, 2015:

[http://www.huffingtonpost.com/wendy-m-williams/women-scientists-academic\\_1\\_b\\_7181676.html](http://www.huffingtonpost.com/wendy-m-williams/women-scientists-academic_1_b_7181676.html)

Stephen J. Ceci and Wendy M. Williams  
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For a long time, two seemingly inconsistent phenomena coexisted, but few seemed to notice: First, the oft-reported experiments demonstrating sexist hiring practices, showing that when comparing hypothetical applicants for academic jobs, men and women prefer male candidates over identically-qualified women. Second, in contrast, hiring audits of *who actually gets hired* reveal that women are preferred over men; women apply less often for academic jobs but when they do, they are more likely to be hired. For example, during 2002-2004, 20% of applicants in mathematics were women, but 32% of those offered the job were women.



**Figure 1.** Fraction of female applicants for tenure-track positions offered tenure-track positions at 89 U.S. research universities (from NRC report, 2009, p. 8, Findings 3-10, 3-13, adapted by D. Miller).

We reviewed a number of hiring audits (see <http://www.pnas.org/content/early/2015/04/08/1418878112.abstract>), showing that women were hired at the same or higher rate than men. This inconsistency between the experimental data and

actual hiring data is glaring--and it led us to wonder whether women applicants are bypassed for men, or if the reverse is closer to the truth.

Some believe there is no inconsistency: They suggest women applying for professorial jobs may be stronger than their male competitors by dint of surviving a sexist winnowing process during which they have less psychological access to female mentors and role models. Thus, they conclude that women who later apply for professorships are superior to males who did not confront bias: "Perhaps the women who survive training in a field where they have few mentors and surmount barriers most men may have little knowledge of, might actually be better. At least we cannot assume they aren't." (<http://feministphilosopherswordpress.com/2011/02/17/is-bias-yesterdays-problem/>)

Many commentators attempt to reconcile the female advantage in actual hiring with the position that sexism is rampant in the hiring process. But we carried out an experiment to evaluate whether excellent women are bypassed in favor of men. If true, perhaps even more women should have been hired, were it not for sexist hiring practices. Sexism both before and after hiring is a separate issue, which we and others are studying elsewhere. But for the purposes of the present study, we focused on alleged bias at the point of hiring, and in the future we hope to report our examinations of bias at other timepoints.

In five national experiments, 873 tenure-track faculty in all 50 U.S. states, from 371 colleges/universities, chose among hypothetical tenure-track job finalists of both genders. A weighted statistical polling-type analysis was done, which considered the numbers of women and men in the faculty's departments, both for faculty who did and did not respond to our request to rank candidates. This polling approach meant that our results generalize to the population of U.S. STEM faculty in the departments we studied. In most contests, there was a male and female applicant who were identically qualified. A third hypothetical applicant was slightly less accomplished, helping to mask the fact that this was a test of preference between equally-accomplished men and women.

Applicants were described with different personalities to suggest the experiment was about preference for one persona over the other. One candidate was described as socially skilled and creative while the other, albeit possessing equal accomplishments, was described as an analytic powerhouse. These personae were systematically swapped across gender of applicants, so some faculty got the woman described as creative and socially-skilled and other faculty got her described as analytic and a powerhouse, and vice versa for male applicants, balanced across both genders of faculty. Many faculty wrote, justifying why they preferred a creative or socially-skilled colleague over an analytical powerhouse, confirming they believed this was the purpose of the study. A subgroup of faculty were asked to guess the purpose of the experiment but they were unable to do this, most opining it was a test of their preference between creative and analytical applicants.

What we found surprised us: The woman was preferred on average 2-to-1 over the identically-qualified man. This strong preference for the female finalist was true in nearly all of the conditions and lifestyles we examined—married, single, divorced, with or without children, recipient of family leave or not. And she was preferred by faculty of both genders and from all four fields. The only exception was male economists; they had no statistical preference for either sex applicant. So, it does not appear that women who are preferred in large-scale hiring analyses were chosen over their

male counterparts because they were stronger than males, since women in all five of our experiments were preferred by faculty even when their male counterparts were identically strong.

Unsurprisingly, our findings were not greeted with uniform enthusiasm (see <http://d-miller.github.io/PNAS-Debate>). Some men do not welcome what they perceive to be reverse discrimination. Some gender advocates were less than welcoming, too, worrying that messages stating this is a propitious time for talented young women to apply for professorial jobs may lull administrators into believing the underrepresentation of women in some fields is no longer in need of intervention.

Elsewhere we have studied the developmental trajectories of men and women to identify barriers and challenges (see <http://psi.sagepub.com/content/15/3/75.full?ijkey=/rLBbJMggBVeg&keytype=ref&siteid=sppsi>). We do not believe women's underrepresentation in math-based science fields will disappear on its own, and we do believe women face hurdles that men do not. But our experiments convince us that the point of hiring is not one of them, and interventions surrounding it (e.g., gender awareness training for search committees that are common at universities across the US) have done their job; thus, resources should now be redirected towards solving other problems faced by women in the academy today. So for now, the obvious conclusion is that at the all-important point of applying for a first tenure-track post, women appear to enjoy an advantage over equivalently qualified men. In a later post, we will address criticisms some have raised about our study, and some ethical implications of our results.

## VIII. WOMEN SCIENTISTS' ACADEMIC-HIRING ADVANTAGE IS UNWELCOME NEWS FOR SOME, PART 2

PUBLISHED IN *THE HUFFINGTON POST*, MAY 4, 2015:

[http://www.huffingtonpost.com/wendy-m-williams/women-scientists-academic-hiring-advantage-is\\_b\\_7195312.html](http://www.huffingtonpost.com/wendy-m-williams/women-scientists-academic-hiring-advantage-is_b_7195312.html)

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In Part 1 of this blog we described surprising new findings from our research showing faculty prefer women over identically-qualified men for an assistant professorship. This preference challenges the common belief that women face bias in hiring. In Part 2 we address three criticisms of our study.

### **Experimental procedure differed from actual academic hiring**

Some stated our national experiments did not represent authentic hiring decisions because in 4 of 5 of these experiments, faculty were not given CVs to study, nor did they meet finalists face-to-face and attend their talks. Most of our studies asked faculty to evaluate three hypothetical finalists for a starting professorship in their department. They were told that their colleagues on the search committee read the candidates' CVs and letters of recommendation and attended their talks, ultimately rating two finalists equally strong and the third slightly weaker. Faculty were given a narrative of their colleagues' evaluation of these finalists and their numeric ratings.

Our goal was to conduct a controlled experiment to reveal attitudes about gender, and this task would not be possible using real applicants in real time, since so many variables would be confounded. When past research using hypothetical candidates revealed antifemale bias in hiring of assistant professors in the female-dominated field of psychology, for example, or in hiring of staff lab managers, the criticism that the hiring task was not veridical was virtually never raised. Perhaps this was because these two former studies presented conclusions our critics found more personally appealing?

We would have published the results of our 4.5-year program of research regardless of what the data showed. We used established methods to study gender bias. That the bias we revealed turned out to be bias against men rather than against women is beside the point: A scientist should ask a question and be open to the results, not presuppose them based on personal beliefs or agendas. We asked a question and throughout five national data collections and multiple side validations and smaller experiments, the answer was almost always the same: women were preferred to men.

Critics claim faculty in real-world hiring situations may not prefer women and in fact may show a bias against them. **However, the actuarial data on who is actually hired in the U.S. shows clearly that women are hired at a higher rate than men.** We are not referring here to experiments—we are referring to real hires of real people, for which women have been preferred since the 1980s. Our article reviewed these real-world data, documenting that women are usually hired more often than men.

The purpose of our experiments was to determine whether women's advantage is because female finalists are stronger than men, as many argue. To test this possibility, the man and woman needed to be identically qualified. We explained why CVs are inappropriate for such a task when it is performed across diverse fields and institutions. CVs have serious limitations because fields and institutions differ in what they consider excellent in terms of number and type of publications. A CV viewed as excellent at small teaching-intensive colleges may not be viewed as such at large doctoral-intensive institutions. Subfields within a field also differ in how a CV is viewed: One that includes "proceedings" publications may be viewed differently in electrical engineering than in mechanical engineering; a CV competitive in developmental psychology will not have enough publications in social psychology.

Short of customizing dozens of CVs for every size and type of institution and all four fields and myriad subfields (and thus introducing incomparability), we created a single narrative summary of a CV that did not list specific number or types of publications. Instead, we summarized colleagues' evaluations of finalists, based on CVs and job talks, with a narrative summary: "Based on her vita, letters of recommendation, and their own reading of her work, the search committee rated her research record as extremely strong." These summaries allowed the 838 faculty (in experiments 1-3 and 5) to substitute the number and type of publications an excellent finalist needed in their own department/institution. In Experiment 4, we gave 35 mechanical engineering faculty real CVs to compare their ratings to those given by mechanical engineers in the experiments that used summaries, and they continued to strongly prefer the woman's CV over the identical CV with a man's name on it.

### **Finalists were too qualified**

Some argued our finalists were unrealistically excellent. Finalists were rated between 9.3-9.5 on a 10-point scale, which is excellent. Some believe that bias against women occurs when women are "ambiguously competent," not when they are unambiguously excellent. But ambiguous competence is unrealistic for finalists for tenure-track professorships. No one hires applicants for the precious few tenure-track jobs who are not stellar, especially in today's buyer's market. Often 50 to 300 applicants apply for a tenure-track post (our most recent search generated 267 applicants, and a number of faculty in our study reported similar numbers). All tenure-track applicants successfully completed doctoral programs, earned publications, and garnered strong letters of recommendation. When hundreds of such applicants are whittled down to the top three finalists, they are unambiguously excellent.

Moreover, evidence from our final two experiments undermines the criticism that finalists were too qualified: 1) the CVs used in Experiment 4 of our study were real CVs, and there is nothing ambiguously competent about them, and 2) in Experiment 5, faculty rated applicants' strength using the same summaries used in Experiments 1-3. They did not rate them 9.3-9.5, but rather 7.14 for males and 8.20 for females. These are still excellent ratings, but there was a lot of room to rate them even higher if faculty wished to do so. Thus, the preference for women in our study was not due to finalists being unrealistically excellent.

### **Faculty guessed the study's aim**

Commentators have claimed faculty were aware we were studying sexist hiring and chose women to appear politically correct. But there are four pieces of evidence showing that this was not the case. First, 30 faculty were asked to guess what the study was about. None guessed correctly. Second, in Experiment 5, faculty were given only a single applicant to rate, male or female. They had no knowledge that a mirror applicant was sent to other faculty with the opposite gender portrayed. It seems farfetched that faculty who got the male applicant downgraded him to 7.14 under an assumption that some unknown faculty member elsewhere would upgrade a female to 8.20. Third, if faculty were aware the purpose of the experiment was to determine if they are biased, faculty should have given the same rank to the identically-qualified man and woman (i.e., tie them for first place). Only a handful of faculty chose this option. Fourth, if respondents knew the purpose of the study, how can we explain why in some conditions male faculty flipped in their preferences from females to males (e.g., preferred married fathers over divorced mothers)? It seems implausible to argue that faculty knew the hypothesis, but only acted upon it sometimes.