

Women in Waterfowl Special Session  
NADS 2019

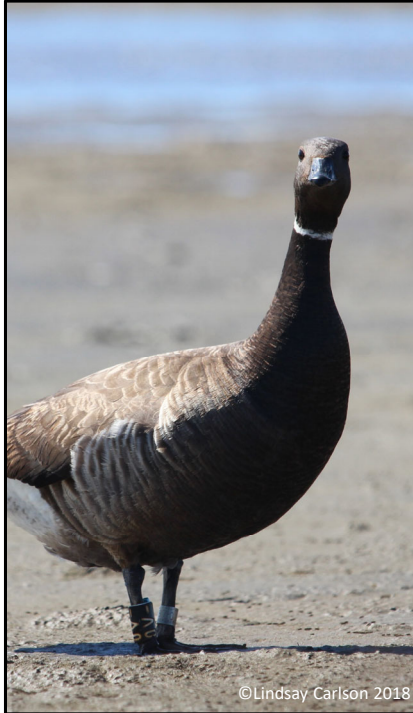
A self-imposed  
♀ Opportunity Gap  
Underemployment

©Lindsay Carlson 2018

LINDSAY G. CARLSON, MS  
GULF OF MAINE RESEARCH  
INSTITUTE

SALLY YANNUZZI, MS  
NORTH CAROLINA WILDLIFE  
RESOURCES COMMISSION

CHEYENNE BEACH  
FORBES BIOLOGICAL STATION  
WESTERN ILLINOIS UNIVERSITY



## 1. Problems

- a. Opportunity gap
- b. Underemployment gap
- c. Wage gap
- d. Confidence gap

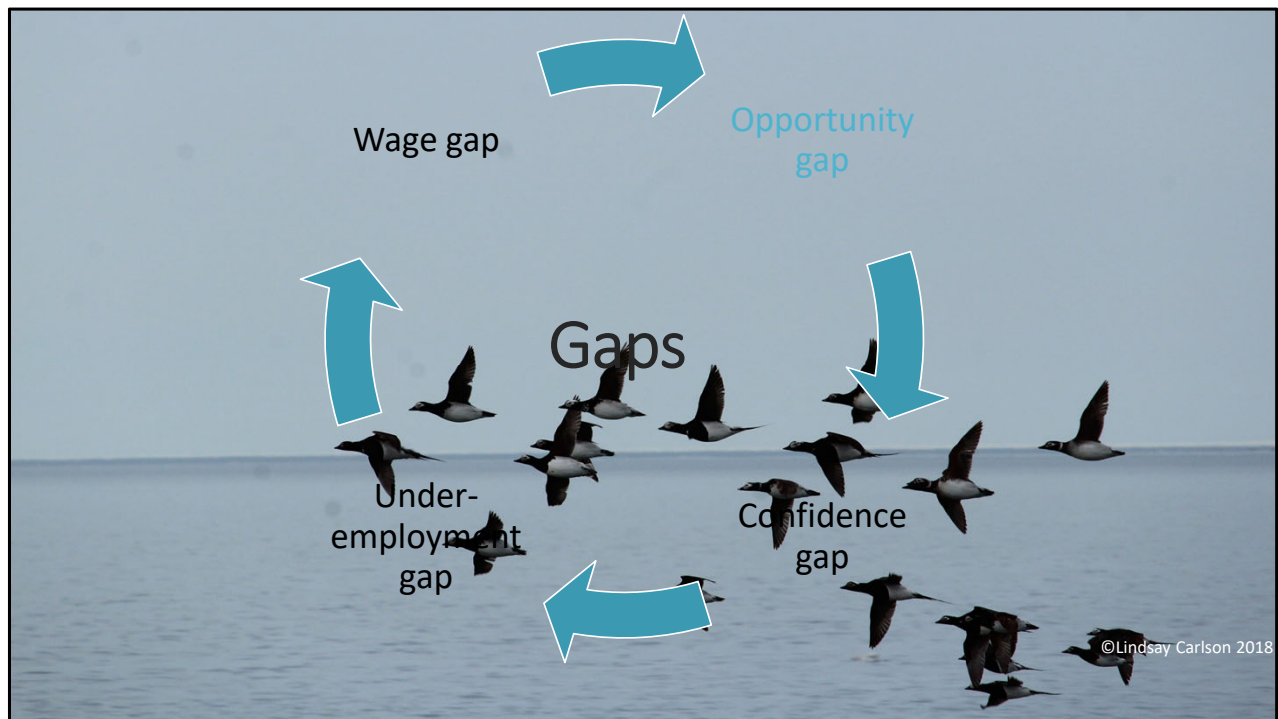
## 2. Approaches

- a. Hiring statistics
- b. Self-reported skills assessment
- c. Confidence self-assessment

## 3. Solutions

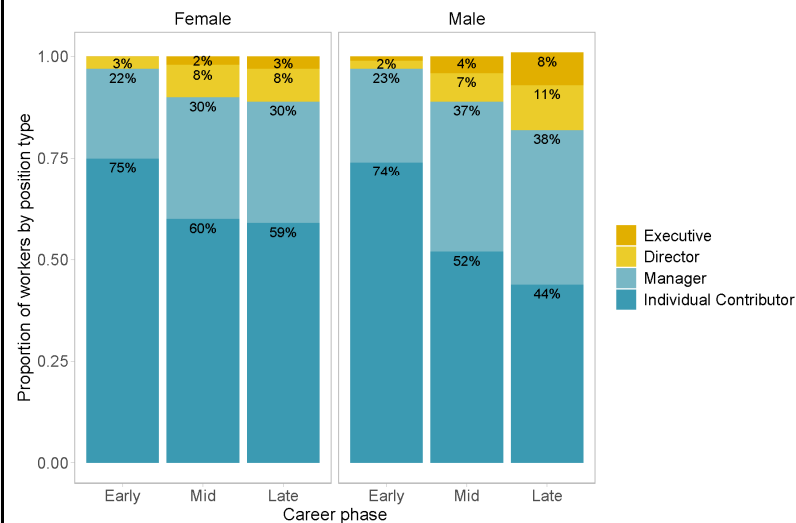
- a. Managing your impostor syndrome
- b. Fostering confidence in others

Talk outline



This talk is focused on the interaction between self-confidence, opportunity, underemployment, and future earning potential for women in the wildlife, specifically waterfowl, field.

## Opportunity gap: minority status contributes to or perpetuates lower achievement or attainment by a group



## Opportunity gap

Females are less likely to reach high-level positions

*“By late career (age 45+), 57 percent of men are managers or higher, while only 41 percent of women reach this level.”*

Data: <https://www.payscale.com/data/gender-pay-gap>

An opportunity gap is generally defined as a gap in achievement or attainment by a minority group.

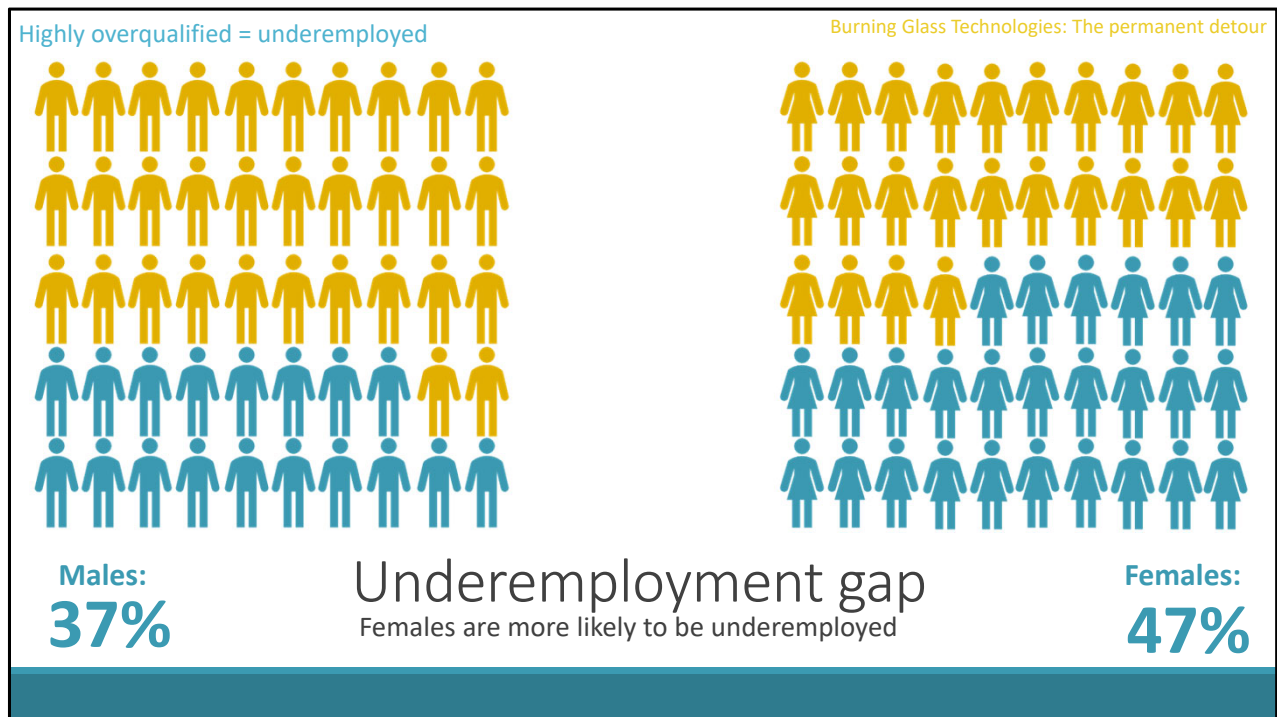
For example, women are less likely to hold high-level, high-paying jobs compared to men. Women also tend to move up the career ladder at a slower pace than men. Men and women enter the workforce in similar positions, but by mid career, the gap between men and women in high-level positions widens and only continues to widen by late career.

WOMEN ONLY APPLIED FOR JOBS WHERE THEY WERE 100% QUALIFIED.  
MEN APPLIED WHEN THEY WERE AT LEAST 60% QUALIFIED.

“UNDERQUALIFIED AND UNDERPREPARED MEN DON’T  
THINK TWICE ABOUT LEANING IN. OVERQUALIFIED AND  
OVERPREPARED, TOO MANY WOMEN STILL HOLD BACK.  
WOMEN FEEL CONFIDENT ONLY WHEN THEY ARE  
PERFECT. OR PRACTICALLY PERFECT.”

HEWLETT PACKARD INTERNAL REPORT

An anecdotal trend the authors of this talk have noticed themselves while hiring for entry level positions (and has been pointed out to them by multiple others) is that most of the women who apply for entry level positions in the waterfowl field are overqualified, while male applicants are either appropriately or underqualified. A study from the Hewlett Packard Internal Report might explain this trend. The report found that women would only apply if they were 100% qualified, whereas men would apply for positions when they felt at least 60% qualified or more.



An opportunity gap often leads to underemployment. Underemployed means working a job for which you are extremely overqualified.

Women are more likely to be underemployed, regardless of major: 47% of female grads in biology and natural resources are initially underemployed compared to 37% of males. Women with STEM degrees are less likely to be underemployed than women in other majors, but still more frequently underemployed than men with STEM degrees according to a study by Burning Glass Technologies.

# Underemployment gap

Side effects include:

**\$10,000**

Making \$10K less than your peers annually

**x 5 years?**

Being 5 times more likely to be underemployed in 5 years

ARE YOU A FIELD  
TECH WITH A PHD?

YOU MIGHT BE  
UNDEREMPLOYED.

DO YOU HAVE A  
GRAD DEGREE BUT  
YOU'RE GETTING A  
STIPEND INSTEAD OF  
A SALARY?

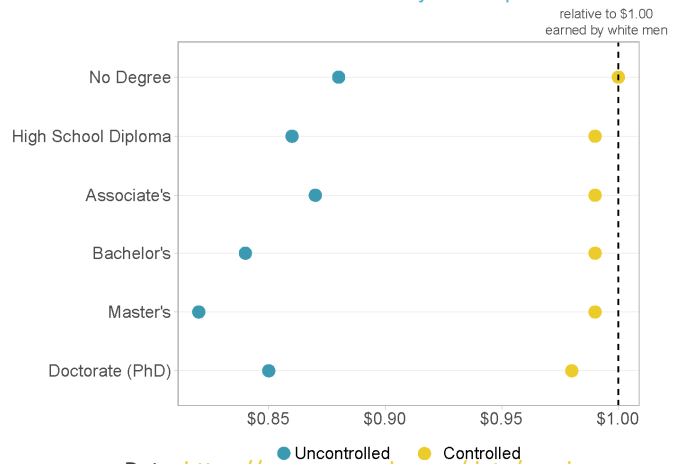
YOU MIGHT BE  
UNDEREMPLOYED.

Burning Glass Technologies: The permanent detour

Underemployment can have long-term earning consequences. People who are underemployed make \$10,000 less per year than their appropriately employed peers and they are more likely to be underemployed 5 years after graduation.

Wage gap (controlled): mean difference between the remuneration for men and women with the same job and qualifications

	Male wage (Weekly)	Female wage (Weekly)	Annual uncontrolled difference
Postsecondary teachers	\$1,603	\$1,253	\$18,200
Physical scientists	\$1,582	\$1,341	\$12,532
Life, physical, and social scientists	\$1,357	\$1,156	\$10,452
Environmental scientists and geoscientists	\$1,427	\$1,245	\$9,464
Chemists and materials scientists	\$1,362	\$1,206	\$8,112
Life, physical, and social science technicians	\$893	\$856	\$1,924
Biomedical scientists	\$1,164	\$1,336	-\$8,944



Data: <https://www.bls.gov/cps/cpsaat39.htm>

Data: <https://www.payscale.com/data/gender-pay-gap>

## Wage gap

Females earn less, which creates a lifetime earning disparity

Wage gap (uncontrolled): mean difference between the remuneration for working men and women

As we pointed out, there is an earning discrepancy for those who are underemployed, which contributes to the wage gap.

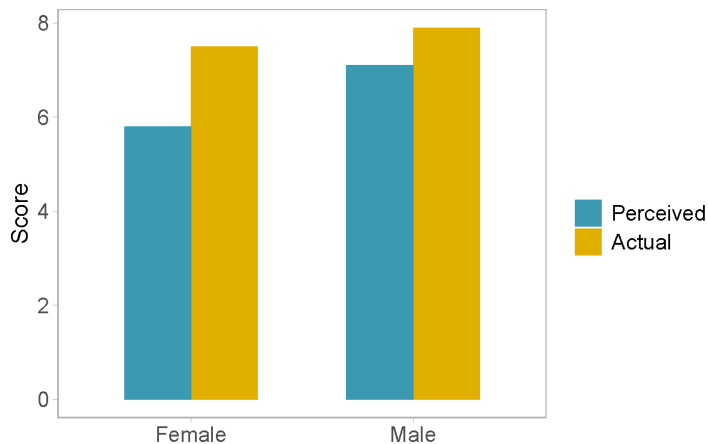
Based on federal data, annual uncontrolled income discrepancy for female scientists and post-secondary instructors is between \$2,000 and \$18,000. An uncontrolled wage gap is the raw difference in remuneration for working men and women, so the effects of maternity leave, underemployment, and the prevalence of women working in lower level positions are considered in the table and in the blue dots of the figure.

When comparing the controlled pay gap, women with the same qualifications and *in the same position* still make about \$0.98 on men's \$1.00 (yellow dots). Women with advanced degrees are under-utilized and under-compensated for their education. Wage gaps tend to be greater for those with more advanced degrees than for those with no degree.



### Confidence gap I: women feel less confident than men in their own abilities

Perceived vs. actual score on a quiz about basic scientific knowledge



## Confidence gap

Females are less confident in their skills/knowledge

Male v female perceived score:  $p = 0.01$

Male v female actual score:  $p = 0.31$

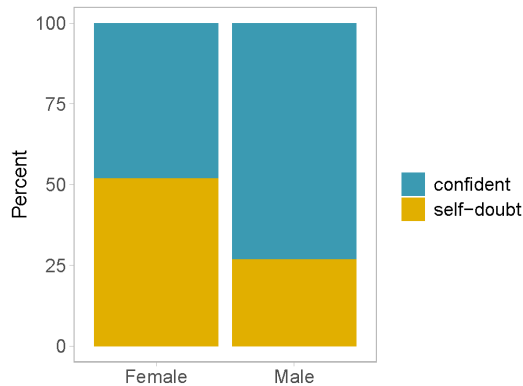
Ehrlinger and Dunning 2003

This leads us to the confidence gap: a theory suggesting that women feel less confident in their abilities than men.

A study by Ehrlinger and Dunning gave male and female college students a quiz on scientific reasoning. When it came to assessing how well they answered the questions, the women thought they got 5.8 out of 10 questions right where men thought they got 7.1 correct. However, their actual score was almost the same—women got 7.5 out of 10 right and men 7.9. Females perceived their score lower than it actually was even though there was no significant difference in their scoring compared to men.

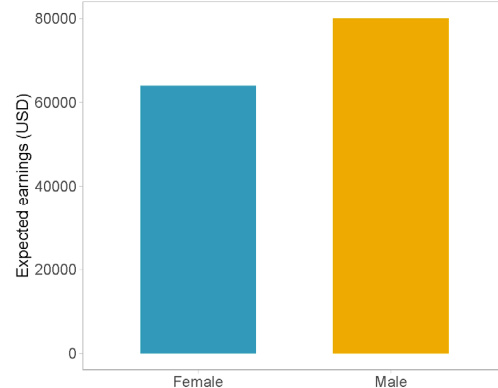
Confidence gap II: females expressing self-confidence are perceived as less hireable or agreeable, so they avoid “confident” behaviors

How confident are you in your job performance?



Institute of Leadership and Management: UK

How much do you deserve to earn 5 years post-grad?



Marilyn Davidson Manchester Business School

## Confidence gap

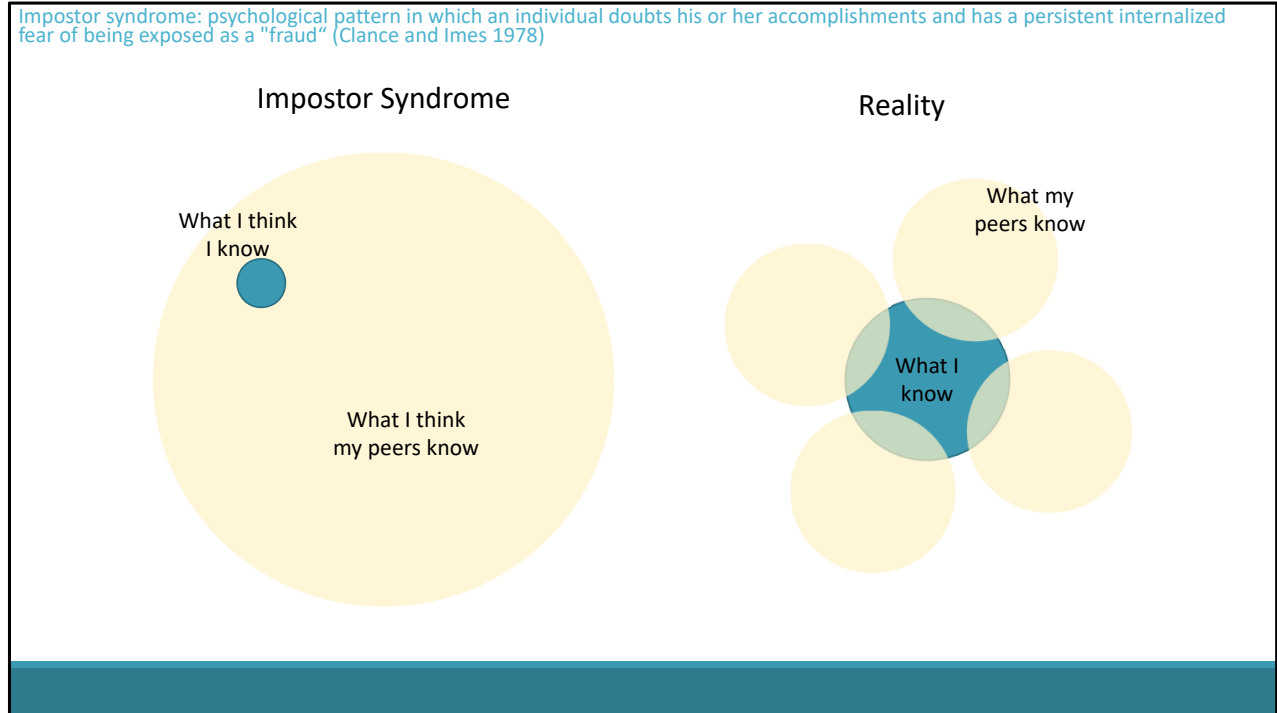
Females are less confident in their job performance and in their economic value

Females tend to feel less confident in their professions. Half the female respondents reported self-doubt about their job performance and careers, compared with fewer than a third of male respondents.

Additionally, studies have found that men initiate salary negotiations four times as often as women do, and that when women do negotiate, they ask for 30 percent less money than men do. When asked how much they thought they deserved to earn 5 years after graduation, female business students expected a salary 20% lower than their male counterparts.

Another manifestation of the confidence gap is that females expressing high levels of self-confidence are perceived as “bossy” or “abrasive” while males expressing the same type of confidence simply labeled “assertive.” For this reason, actually confident women may avoid confidence-associated behaviors, such as asking for a raise, in order to avoid negative perceptions.

Impostor syndrome: psychological pattern in which an individual doubts his or her accomplishments and has a persistent internalized fear of being exposed as a "fraud" (Clance and Imes 1978)



We think that the confidence gap is tied to impostor syndrome.

Impostor syndrome is the persistent inability to believe that one's success is deserved or has been legitimately achieved as a result of one's own efforts or skills. This phenomenon was originally described by Drs. Clance and Imes. It is more prevalent in women, but anyone can experience feelings of impostor syndrome.

# Approaches



As we have discussed, the wage and underemployment gaps have detrimental career-long effects on women. We hypothesized that the wage and underemployment gap may be driven by a self-imposed opportunity gap. Women are less likely to apply for positions that they are not “overqualified” for, which leads to “underemployment,” and underemployment has lifetime earning effects. We wanted to explore the underemployment trend and quantify the attitudes that drive the decision to apply.

We hypothesized that females would be more likely to apply for positions for which they are overqualified and that females will agree more frequently than males to questions acknowledging “impostor syndrome” or feelings of inadequacy.

To test our hypotheses, we created three surveys. We used the first to collect hiring demographics from the people who are currently hiring for entry-level waterfowl positions. We used the second and third surveys to assess attitudes toward job applications and self-confidence.

# Hiring Statistics

Study population:  
Hiring managers for  
waterfowl positions  
in North America

Sample population:  
“Minders of the  
Marsh”

Sample size: 27(43)

Survey type: Survey  
Monkey fill in the  
blank/multiple  
choice

Sample pop:  
♀ 12%

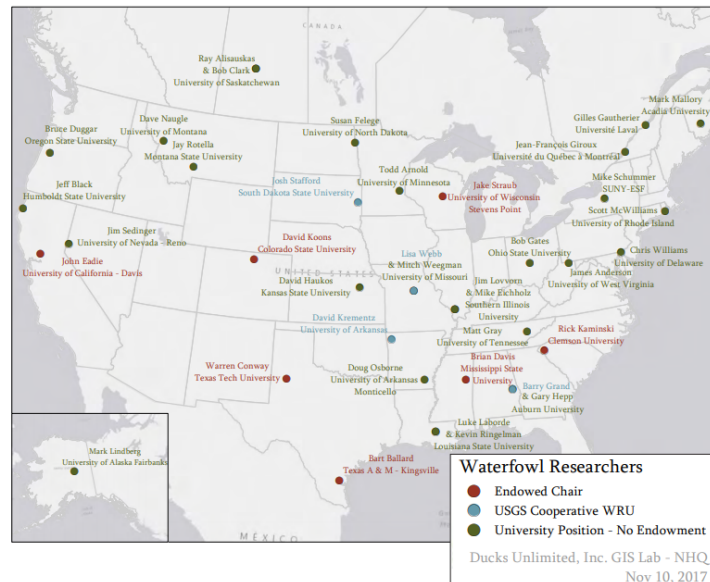


Figure: [https://deltawaterfowl.org/wp-content/uploads/2017/12/2017\\_Who-Will-Mind-The-Marsh.pdf](https://deltawaterfowl.org/wp-content/uploads/2017/12/2017_Who-Will-Mind-The-Marsh.pdf)

For the first survey, our study population was hiring managers for waterfowl positions in North America. Our sample population included the individuals identified in the Who will mind the Marsh document. Our sample contained 43 people and we received 27 responses. We used an online survey to collect data about the number, education level, and experience level of applicants for entry level waterfowl positions.

# Hiring Statistics

## Analysis

- a. Fisher's exact test for count data

## Results

- a. No gender difference in hiring manager-reported years experience or education level of applicants
- b. No difference in hiring manager-reported proportion of applicants for position by salary or work environment

2. What was the work environment for the position?

- ☐ Non-remote field work
- ☐ Remote field camp
- ☐ Office only
- ☐ Laboratory
- ☐ Combination of field and office duties

3. What was the salary range for the position?

- ☐ \$0 - \$10/hr (< \$20K annual)
- ☐ \$11 - \$20/hr (\$21K - \$42K annual)
- ☐ \$21 - \$30/hr (\$41K - \$62K annual)
- ☐ >\$30/hr (>\$62K annual)

4. How many males applied to the position?

5. How many females applied to the position?

Qualified females are applying for all types of positions

We used Fisher's exact test for count data to quantify gender differences.

We found no difference in years of experience or education level of applicants by gender. Also, there was no difference in the proportion of female applicants by salary or work environment. The conclusion from this survey was that qualified females are applying for all types of positions, and this is a great start!

# Self-reported skills assessment

Study population:  
Waterfowl graduate  
students in North  
America

Sample population:  
Former, current, and  
previous graduate  
students of “Mindere  
of the Marsh”

Sample size: 77(183)

Survey type: Google  
Forms “mock job  
posting” survey

Sample pop:  
♀ 38%



Photo: Jeff Newton, University of Arkansas at Monticello

Doug Osborne Lab 2018

Next, we wanted to look at the attitudes of early career professionals in the waterfowl field as it relates to their decision to apply for positions at various levels.

Our study population was waterfowl graduate students in North America and we used the current and former graduate students of Mindere of the Marsh as our sample population. We sent the survey to 183 graduate students and received 77 responses.

# Self-reported skills assessment

Four mock job postings:

- a. Entry level (neutrally worded)
- b. Mid-level (feminine language)
- c. Mid-level (masculine language)
- d. Upper-level (neutrally worded)

“Would you apply?” and caveats

10 self-assessed skills related to each position (as in USA jobs)

The screenshot shows a survey form titled "Mock Job Posting Survey" with a sub-header "Job Posting 1". It contains a detailed job description for a Waterfowl Technician, including duties like trapping, banding, and data entry. Below the description are sections for "Required Qualifications" and "Preferred Qualifications". At the bottom, there are two questions: "Would you apply for the above position?" with radio button options "Yes, I would apply" and "No, I would not apply", and "Please rank your experience with the following:" followed by a list of skills and radio button options for experience levels: "I have no experience with this task", "I have had classroom or on-the-job training with this task, but have not yet performed it", "I have performed this task with supervision", and "I have performed this task regularly without supervision".

The first survey asked participants to read four mock job postings, similar to those they may have encountered throughout their career thus far. The postings contained three levels (1 entry level, 2 mid level, and one upper level position). The two mid level levels posed a similar job posting, but one used feminine-associated language (i.e., collaborative, understanding) and one used masculine-associated language (i.e., assertive, self-sufficient).

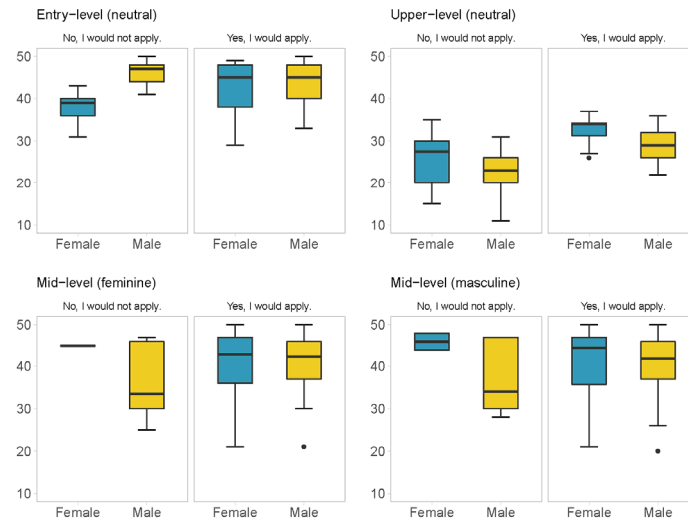
After reading the job posting, participants were asked to decide whether they would apply for the position, not based on whether they were interested in the study or the species, but whether they felt appropriately qualified to apply for the position. Participants were then asked to rank their experience with a 10 skills required by the job using the same scale as USA jobs. We also asked them for demographic information such as gender, education level, and number of years of experience in a waterfowl/wildlife/ecology field.



# Self-reported skills assessment

## Analysis

- a. Logistic regression modelling decision to apply based on self-rated experience and self-reported demographics
- b. Tukey tests on experience level for decision to apply and gender



We conducted a logistic regression to quantify the drivers of the decision to apply. We also calculated Tukey differences between experience level by gender and decision to apply.

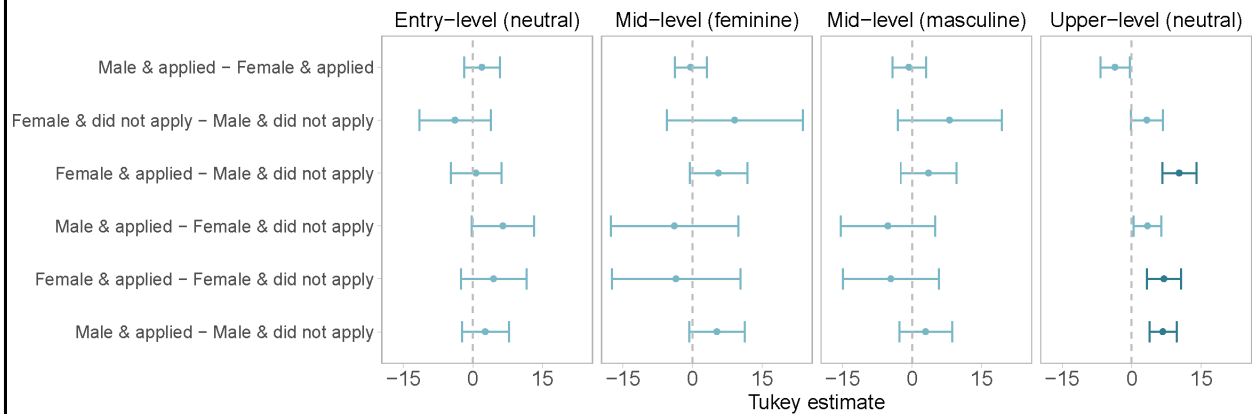
The figure shows self-reported skill level by gender and decision to apply. Most participants rated themselves as highly qualified for the entry level and midlevel positions.

Decision to apply model	K	AICc	$\Delta$ AICc	Wt.
~ self-rated experience	2	269.22	0	0.44
~ self-rated experience*gender	3	271.02	1.81	0.18
~ self-rated experience + gender	4	271.16	1.95	0.17
~ self-rated experience + education	4	271.38	2.16	0.15
~ self-rated experience + education + gender	5	273.17	3.95	0.6
~ education	3	297.8	28.58	0
~ education + gender	4	299.8	30.59	0
~ gender	2	302.41	33.19	0
~ minority status	3	303.94	34.73	0
~ years of experience	4	304.58	35.36	0

Self-rated experience and gender were more important predictors than education or years of experience

Based on the logistic regression including all four postings, self-rated experience and gender were the top predictors. We interpreted this in two ways: firstly, that respondents considered how their own skills matched up with the position's stated requirements more strongly than their overall level of experience or education. Secondly, we concluded that gender could not be ignored when assessing a participant's decision to apply.

# Self-reported skills assessment



Females know they're qualified, but take fewer application "risks" than males

Interestingly, we found no difference in experience between males and females who did and did not apply for the entry and mid level positions (the light blue lines in the first three panels).

However, for the upper level position (rightmost panel), females who applied had greater experience than males who did not apply but, males who did apply were not significantly more experienced than females who did not apply.

Our conclusion from this survey was that females who are equally qualified to males who applied to the upper level position took fewer "risks" and opted to not apply for the upper level position, even though many were equivalently qualified to their male counterparts who did apply.

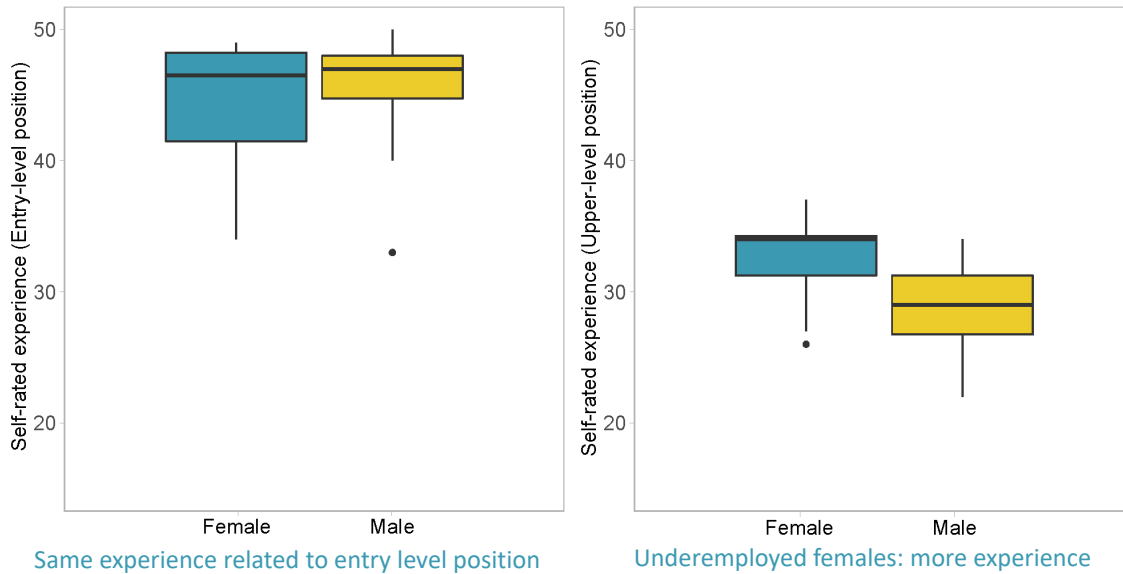
	Male	Female
Accepted underemployment (applied for entry-level and upper-level position)	0.50	0.46
Refused underemployment (applied for upper-level position but not entry-level position)	0.19	0.00
Applied for feminine-worded position, but not masculine-worded	0.04	0.04
Applied for masculine-worded position, but not feminine-worded	0.02	0.00

A similar proportion of males and females “accepted” underemployment, meaning that they felt qualified enough to apply for the upper level position, but they were still willing to apply for the entry-level position, for which they were likely extremely overqualified.

However, no females who said they would apply for the upper level position said they would not apply for the entry level position, a condition that we called “refused underemployment.”

Though the masculine and feminine wording did not have a strong effect on the decision to apply or the self-rated experience level, 2 males and 2 females said they would apply for the feminine worded position but not the masculine, but 1 male said they would apply for the masculine worded position, but not the feminine.

### Self-rated experience of those who “accepted underemployment”



For those who fell in the group of “accepted underemployment,” males and females had similar self-rated experience with the entry-level position, but females had more experience than males with regards to the upper-level position, but despite their high level of experience they still did not reject to apply for the entry-level position.

# Confidence self-assessment

Study population:  
Waterfowl graduate  
students in North America

Sample population:  
Former, current, and  
previous graduate  
students of "Minders of  
the Marsh"

Sample size: **50**(183)

Survey type: Google  
Forms survey based on  
**Clance Impostor  
Phenomenon Scale** with  
Likert responses

Respondents:  
♀ **40%**

## Self Evaluation Survey

Please provide your opinion on each of the following statements about yourself.

I feel that I am appropriately compensated for my work.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree

I feel comfortable asking for an increased rate of pay when I do not feel

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree

Overall, I have the skills to develop into a good researcher.

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly agree

Finally, the confidence self-assessment targeted the same study population and received 50 responses. For this survey, we used survey questions based on the Clance Impostor Phenomenon Scale (CIPS) by Clance and Imes.

# Confidence self-assessment

## Analysis

- a. Bayes' Rule (Conditional probability of positive response according to gender)

$$P(\text{Female}|\text{Agree}) = \frac{P(\text{Agree} | \text{Female}) P(\text{Female})}{P(\text{Agree})}$$

## Results

- a. Females more likely to agree with "impostor-syndrome" statements
- b. Males more likely to agree with "confident" statements

$$P(\text{Male}|\text{Agree}) = \frac{P(\text{Agree} | \text{Male}) P(\text{Male})}{P(\text{Agree})}$$

Gender difference

To analyze this data, we used Bayes' rule to calculate conditional probability of positive response according to gender. We subtracted the probability that a respondent is male given that they agreed to the prompt from the probability that a respondent is female given that they agreed. We called this the gender difference in response.

# Confidence self-assessment

Gender difference > 0 (Females agree more)

Gender difference < 0 (Males agree more)

**Q10:** The major cause of success in my life is my high ability

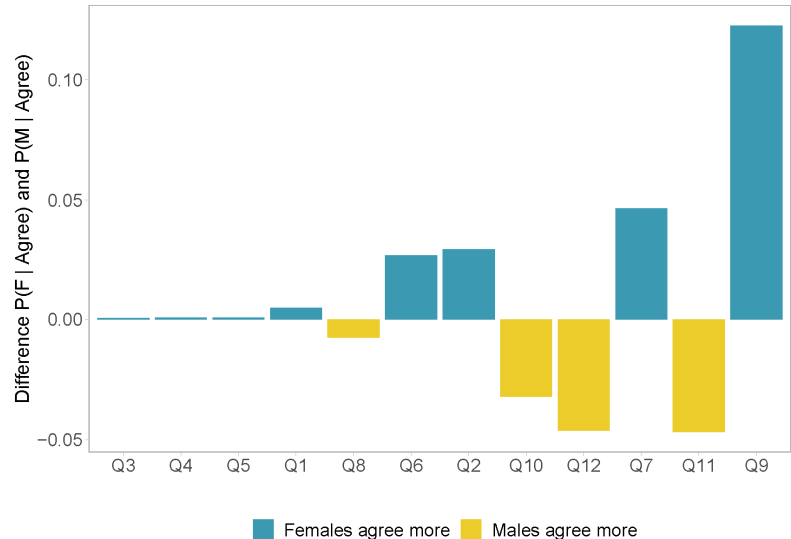
**Q12:** When I succeed, it is because I work much harder than others.

**Q11:** I am at least as smart as my peers.

**Q2:** In general, people tend to believe that I am more competent than I really am.

**Q7:** Sometimes I am afraid others will discover how much knowledge or ability I lack.

**Q9:** At times, I feel I am in my current career position through some kind of mistake.

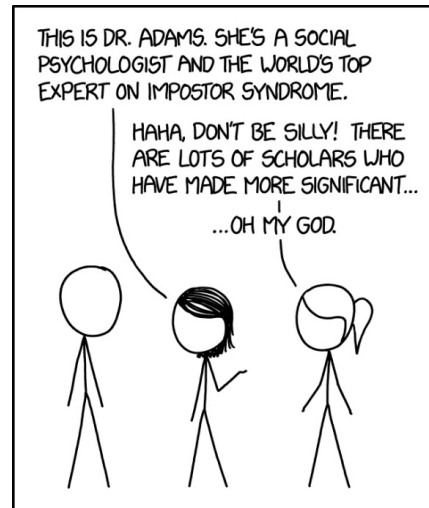


We found that females were more likely to agree with statements acknowledging feelings of impostor syndrome like “In general, people tend to believe that I am more competent than I really am” or “Sometimes I am afraid others will discover how much knowledge or ability I lack” or “At times, I feel I am in my current career position through some kind of mistake.”

Males were more likely to agree with statements acknowledging self-confidence like “The major cause of success in my life is my high ability” or “When I succeed, it is because I work much harder than others” or “I am at least as smart as my peers.”

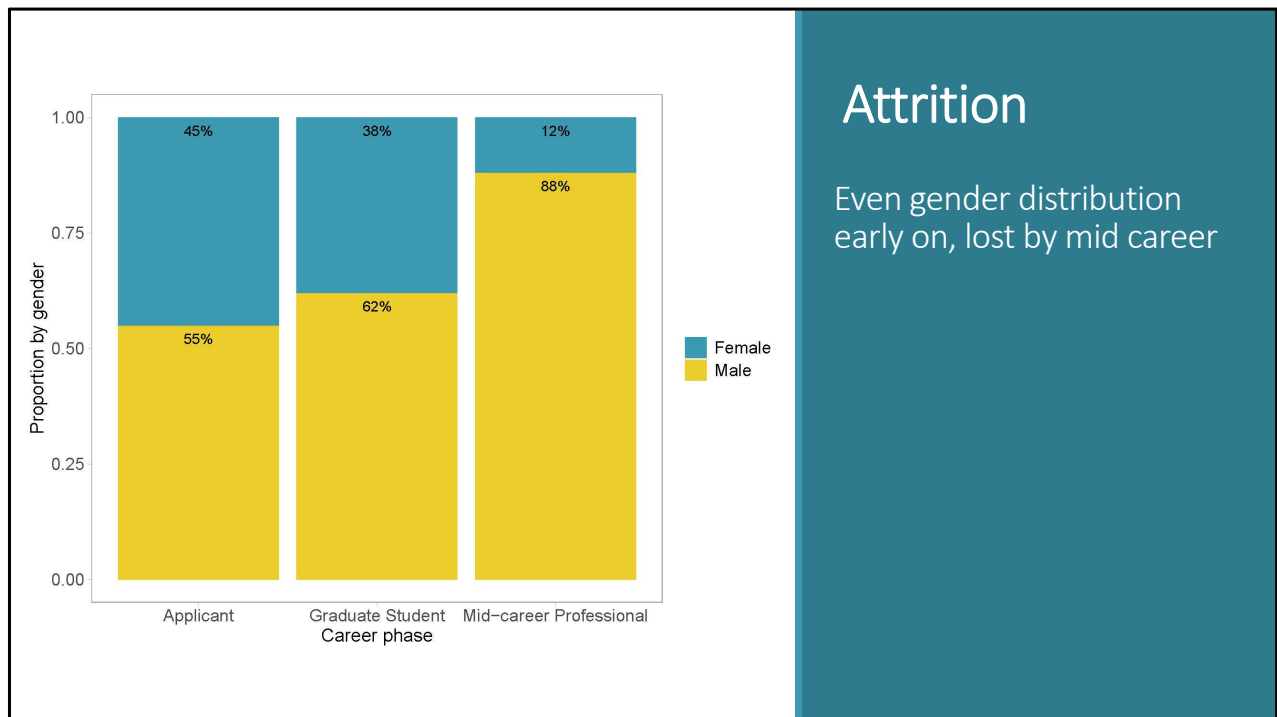


We know we're qualified; we just don't believe we deserve our successes.



Comic: <https://xkcd.com/1954/>

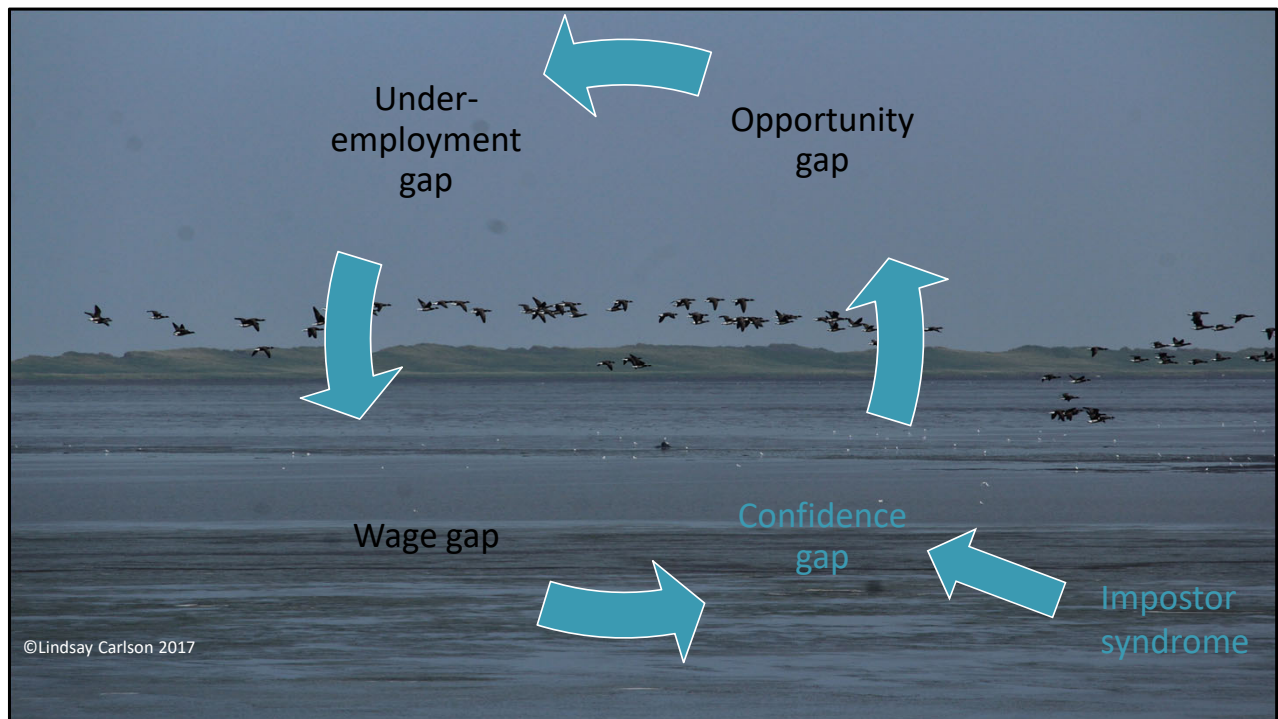
Overall, the results of these surveys lead us to the conclusion that qualified females are applying for a variety of positions. Female graduate students do take fewer application risks than male graduate students, but they are equally qualified for the types of early-career positions commonly found today. However, females are still significantly less confident than males, as concluded by analyses of the impostor syndrome/self-confidence survey. In conclusion, women know that they are qualified, they simply don't believe they deserve success.



## Attrition

Even gender distribution early on, lost by mid career

I think its worth pointing out that in the applicant pool reported by the hiring managers, gender ratios were very even. For our graduate student study population, 38% were females. However, mid-career professionals in our sample were only 12% female, so there is quite a bit of attrition and many females are lost by mid-career. We clearly need to fix the gap in this leaky pipeline.



Imposter syndrome is one of the sparks that ignites many issues, creating a self-perpetuating negative feedback loop that feeds into the confidence, opportunity, underemployment, and wage gap.

## Solutions

### Activities that contribute to the maintenance of impostor syndrome

- a. Diligence and hard work to prevent inadequacy from being discovered leads to a vicious cycle of obsessive work
- b. Engaging in intellectual authenticity (does not reveal real thoughts or opinions)
- c. Using charm and perceptiveness to “win over” superiors
- d. Observing the consequences of societal hostility toward confident successful women

Whether or not you're aware of it, many of the things you do that you think are helping you to succeed are actually feeding into the imposter syndrome. Working really hard to make up for your self-perceived lack of knowledge only serves to create unhealthy work habits, holding back from speaking your mind holds you back from sharing great ideas, relying on your friendliness to put yourself in good standing prevents you from showcasing your intelligence, along with many other acts only works toward continuing the syndrome cycle.



©Sally Yannuzzi 2018

## Solutions

### Managing your impostor syndrome

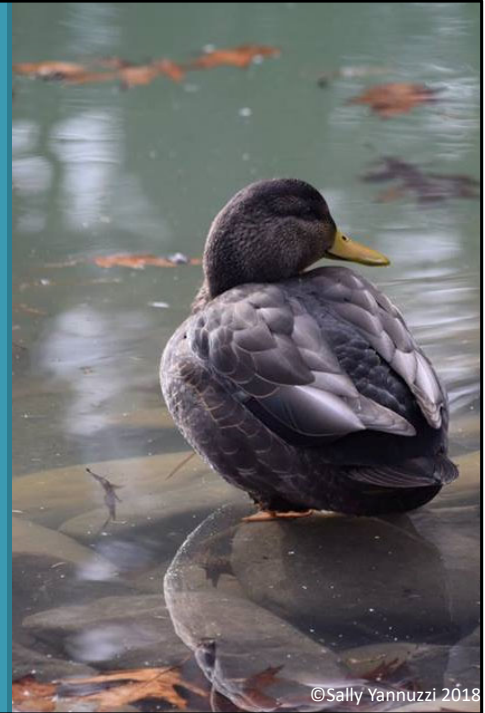
- a. Confront it
- b. Voice your feelings
- c. Recognize the disparity in your feelings versus reality
- d. Be kind to yourself
- e. Talk to someone: see a therapist if you need to

So then what are some ways that you can actively work towards stopping this negative loop? Firstly, face the issue head on! Talk it out with your peers or mentor, people that you can relate with. Sharing your experiences helps to normalize the way you're feeling and provides some relief. Remember, approximately 70% of us feel similarly. Second, try to step back from your feelings and see it as an outsider. Look at the facts of your qualifications and successes versus how you're feeling in the moment. Don't forget to treat yourself with the respect and kindness you would give your friends and family. You wouldn't tolerate someone devaluing someone you care about, so don't do it to yourself.

# Solutions

## Managing your impostor syndrome

- a. Adjust your mindset
- b. Failures” are opportunities to learn
- c. You’re here because of your hard work
- d. Don’t dismiss your successes
- e. See yourself succeeding



©Sally Yannuzzi 2018

Next, adjust your mindset. Previsualize the negatives and turn them into positive experiences by asking “what did I learn from that?” A failure is just a chance to learn and improve for the next time. When you’re feeling anxious about your future performance, take the time to visualize yourself succeeding in these situations. Often, picturing ourselves doing well helps to admonish negative feelings and allows us to reach our potential. Lastly, don’t diminish your skills and accomplishments. Remember that you’ve gotten here due to the hard work and time you’ve invested, not by pure luck, fluke, chance, or karma.



## Solutions

### Fostering confidence in others

- a. Normalize the imposter syndrome
- b. Stick to facts of success
- c. Affirm and evaluate progress and achievements
- d. Encourage cohort bonding
- e. Relate to your mentee
- f. Give them credit where due
- g. Encourage mentees to aim high

Now for those of you who work with, advise, or mentor in some capacity a person who expresses feelings of the imposter syndrome, there are steps you can take to help them overcome this pitfall. Share your own feelings of insecurity and let them know that they're not alone or unique in their feelings. Try to backtrack them and remind them of all that they've accomplished, and how they got to where they are now. Additionally, encourage them to bond with their cohorts near and far. Having a support system with which mentees may feel more comfortable expressing their insecurities will help them overcome difficult times and allow them to build each other up, which is vital to long-term success.

<https://github.com/LGCarlson/Impostor-Syndrome/blob/master/README.md>



Finally, please find a link to resources on underemployment and impostor syndrome including peer-reviewed articles and helpful podcasts.



# Acknowledgements

**The women who put this session together**

**Women in Waterfowl Research Group**

**Academic advisors/hiring managers**

**Current, future, and former graduate students**

**Those who reached out to us after the surveys to offer additional information**

**Our mentors and the men and women who have blazed a path in this field**

**Our institutions for supporting us attending this conference**


**USGS CRU**

©Lindsay Carlson 2017

We have many people to thank for their contribution to making this session, study, and talk a success.



We hope that female biologists realize that they don't have to choose between being smart, feminine, and strong. You can do it all.



This presentation was created for the Women in Waterfowl Special Session at the North American Duck Conference 8 in Winnipeg, Manitoba. This presentation has been made publicly available for educational purposes. The opinions stated herein do not represent the opinions of the author's employers or associated organizations. All intellectual property not belonging to the authors has been cited within the presentation. All other data, figures, and images are the property of the authors and may not be reproduced without proper permission and citation. Please find contact information for the authors below.

©Lindsay Carlson 2018

LINDSAY G. CARLSON  
LCARLSON@GMRI.ORG

SALLY YANNUZZI  
SARA.YANNUZZI@NCWILDLIFE.ORG

CHEYENNE BEACH  
BEACH312@ILLINOIS.EDU