

Science AMA Series: I'm Katie Ryan, graduate student from Vanderbilt University. I recently published a paper describing the bases for gender differences in visual recognition using Transformers and Barbies. AMA!

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What are the implications and practical applications to your findings?

[Latestfailure](#)

Our "take home" here was to show the role of experience in recognizing faces. While previous work might show that there is a female-advantage for face recognition, whether based on some hard-wired difference, we show that there is some component of experience that influences how we recognize things in the world around us.

This matters as a part of a larger study of research, because I am interested in how the brain changes as a result of experience (connectivity between regions, differences in patterns of activity with different stimuli). So this paper is really a small step in a larger body of work I wish to continue with.

It also matters because gender differences are perhaps not as "special" as some may posit. It reinforces a lot of flexibility by suggesting that with the right amount and right type of experience, any person can have similar skills. Now, that "amount" and "type" are whole other bodies of work that are very interesting!

Thanks for joining us today!

A few questions:

1. My libraries don't have electronic access to the journal, what were the significant results from your statistical analysis (CIs, p-values, etc...)?
2. Why no highlights section?
3. [This](#) 2016 paper in Nature on macques described basically the opposite conclusion, can you briefly comment on it?

[PHealthy](#)

Hopefully you were able to see the link posted for the paper!

I think that is an interesting paper and I would definitely like to take some more time to dig deeper into it (I've only been able to briefly skim it, but I think there is definitely a lot to it). The authors seem to agree that experience does play an important role, and I think neither we, nor they, would be willing to say that EITHER genetics OR experience are wholly responsible for the results here - that would be just bad science. However, with our findings we show that yes, experience is very important in how we recognize faces, and objects, in the world around us, and that our ability to recognize faces can be very flexible over a lifetime. I think we are also looking at slightly different things here -- gaze preferences while faces are still novel to an infant macaque and how well adult humans perform when recognizing different types of faces. I think both our studies bring very interesting insights into the extremely intricate process which is face recognition.

In the research community, is there pressure or prejudice when it comes to research about gender differences? For example, is it easier to publish a paper showing that there are innate differences vs. one showing that the differences disappear if you control for X or Y?

[immerc](#)

Not exactly. We found a lot of previous work suggesting that gender differences might be related to some innate differences between males and females. However, the lab I worked with for this study focuses on understanding differences in experience or training that lead to differences in brain activity, behavior, etc. I think that one great aspect of this particular study is that it brings together a lot of fields that can be pretty separated (gender differences, face recognition, experiential differences, etc.) and shows common threads between them.

My focus in this study was not necessarily genders or toys, but rather, how experience can modulate the way in which we approach the world around us. Using Barbies and Transformers and males and females is just a way for us to approach experience differences in what we see in the world, one that has already been fairly neatly laid out!

It sounds like you did a study to show that kids can recognize either toy, regardless of gender, once they have been exposed to them.

How is this "contrary to a lot of previous work"?

I'd be more shocked if your results were different. Or am I completely missing what was done in the study?

[Colosseros](#)

You're correct in your understanding of our findings.

We found that a lot of previous work suggested that when recognizing faces, there was some female-bias that gave them an advantage. This has been attributed to some underlying difference, however, we think there is a more fitting explanation do this difference between men and women.

We wanted to drive home the point that "face recognition" is perhaps not some special, overarching ability. Rather, it describes a skill that modulates based on experience. This is something that has been said for other areas, so here we are showing that link. It serves more as a stepping-stone into other work, and as a study to tie together the work of others.

Your paper's purpose was to investigate whether the differences in ability to recognize these images were due to gender effects or level of familiarity. Based on your Fig 3, the performance of both genders were statistically the same except for barbie recognition. Your conclusion is that these individuals had different self-reported experiences (Fig 2), so these differences must be from self-reported experience. How exactly does this logic demonstrate that these self-reported experiences aren't also gender-based (ie, you have no control group which shows a difference in performance based on self-reported experience which also happens to be gender neutral)? I think that this demonstration is crucial to making your argument.

[jimboalice86](#)

In Figure 3, the important comparisons are how males and females perform recognizing Transformer and Barbie faces. Per the text:

The Category x Gender interaction was significant ($F(3,879) = 13.22, p < .001, \eta^2 = .043$); LSD post hoc tests revealed that women performed better than men with Barbie faces ($p = .001$), whereas men performed better than women with Transformer faces ($p = .001$) and cars ($p = .002$).

The reason we chose to look at how individuals are recognizing the faces of Barbies and Transformers is that we can assume that overall in our sample and in the population, males have more experience and exposure with Transformers and females with Barbies. We include an attempt at collecting self-reported experience to show this. However, we do also discuss in the text that our questions for experience were not the best way to do this, but it was the best we could do given our limitations. This is why we chose two very gendered, distinct toy categories. Other research in this lab goes into more detail about how to best examine expertise and how to best measure it in individuals, as it is an extremely difficult construct to measure (I'd be happy to point you towards that research!). We tested Caucasian male faces along with our toy faces, and found no difference here between our groups. You are right in that it is not the perfect measure, but I don't think that it takes away from our overall message here.

How is this not just an exposure effect of gendered marketing?

(I don't have access to the full paper from home in case you addressed it in the limitations/sampling)

[ma6ic](#)

I have added a link to where you can find the full-text so you can read it if you want!

It is entirely possible that this is the case. Our purpose here was to examine the role of experience in how individuals can effectively recognize types of faces. So, in this case, marketing can certainly influence the amount and type of exposure that individuals receive. So, if for some reason Barbies were marketed to male children and Transformers to female children, we would expect to see the opposite resulting here.

How do you believe these results apply to other cultures where these toys might not be present?

[OutOfWaldorfs](#)

If we look at the role of experience, then we might find that individuals who are not exposed to these toys would not be able to recognize them as efficiently as other toys they are more experienced with. Our goal was to describe the role of experience. In our case, we believe that experience drives the "gender differences" between Barbies and Transformers. If you had males that were more experienced with Barbies and females more experienced with Transformers, we would expect the opposite results.

You could substitute different types of objects, different toys, different faces: If there was a difference in experience and exposure with them, we would expect the findings to reflect that.

Reading the article about the study, it says that there is a correlation between identification of Transformer faces and cars by men that suggests they may be recognising 'faces' in the cars. Is this suggesting that the types of toys and media that men are exposed to as children affects their human facial recognition ability?

[rhododendronz](#)

Not exactly. The lab I worked with during this study does a lot of work with expertise in object recognition. Cars are one category which they study a lot. In general, they find that individuals who are "car-experts" are often men, and some might state that there is some difference that leads men to be better here (some research has stated that men have better mental rotation abilities, which could help). However, this could be due to the fact that cars are just more a "guy-thing" so this experiential difference is what really gives them the advantage. We noted the correlation between Transformer faces and cars as a tie back to the previous research from the same lab.

The media could certainly influence the types of faces that people are exposed to, which could have some sort of effect. If we look at "face recognition" as a sum of differential categories that are influenced each by experience, sure, then looking at different types of faces does influence how we recognize them.

Given that gender & gender differences are a political lightning rod, did you experience any external pressure attempting to influence the study in some way (e.g. to deter you from studying this or to steer you towards a specific outcome)?

[toby_wong_1](#)

The fact that we discuss gender and gender differences, I believe, is why this paper has become popular. I am not specifically interested in conducting research on gender differences - I am interested in how experience modulates how we see the world around us, and how experience with different objects influences our brain.

For me it is all about that science, and this paper is more a stepping-stone for further work. Gender differences were, in this study, a case that was available for us to study. A real-world example of experience differences that are already present in "real life."

A keystone of science is present unbiased facts, and while I agree we did use a very controversial topic, which is cool in that it gets people talking, we weren't steering our results in any way. That said, I do find people can get caught up in "gender" and not necessarily "experience" which is the important part here.

How can we use this information?

[|||||](#)

For us as researchers, it is important for understanding that we can't look at "faces" as one special category - that differences in experience can modulate our ability to efficiently understand and recognize different types of faces, just as we might expect for different classes of objects (you don't just say someone is an expert at recognizing "things" rather, they might be a bird-expert, a car-expert, etc.)

In other ways, I think it is important for understanding how we interact and interpret with the world

around us. As [u/soada0226](#) mentioned, understanding experience differences related to marketing, it gives us a general framework that we can use to look at gender differences, age differences, etc. It gives us more questions to ask-- how much experience and what type of experience could give us reverse results? What happens in the brain as experience changes?

I can't get access to the paper, so apologise if this was addressed. Why were transformers used instead of say action men, wrestlers or some other non-anthropomorphised toys? Is this something that could potentially influence the results?

[weefraze](#)

I updated the link to include a way to get the full-text paper so I hope you can read it!

The point here was to look at how experience influences face recognition, and we used men/women and Barbies/Transformers as a case where we could dig into these differences. We chose Transformers as a toy category that is very easily recognized, with some sort of face, and which many age groups have interacted with, giving us flexibility in our sample, so they were actually just what we wanted for this particular study!

The lab I worked with during this study has done some similar research, using a wide variety of visual categories: from birds, mushrooms, leaves to cars and airplanes, and even made-up objects.

Were people with gender dysphoria tested? If so, were they tested under their assigned gender, or under their identified gender?

[Pyrollamastek](#)

At the onset of this study, our participants completed a survey. We asked their gender and used this to categorize our subjects for analysis. So, we did not specifically check whether any of our participants whether they experienced gender dysphoria.

We were interested in looking at experience differences with our stimuli here (the Barbies and Transformers) and based this overall that females would have more experience with Barbies and males with Transformers. Quantifying experience is a very, very difficult task (some of the work from the lab I was with while working on this study describes this in further detail), so this was the best way for us to do so in this particular study.

Teasing apart gender and experience for these toys in a different study, could be an interesting way to support our results from another angle.

Hi! Thanks for doing an AMA! I am a soon to be applied psychology masters student in southern England, finishing my bachelors. I am mostly interested in facial perception and links with memory. I also used to be an optometrist, so visual perception is my thang! Can I ask: How old were your participants? What made you choose the items/ stimuli that you did? Where were your participants from? Similar backgrounds or did you manage to get some variation?

What are you hoping others will take from this? Another study but changing or improving, or do you think there is a practical application? Thanks!

[badassmum](#)

- We used a wide range of participants for this study by using both in-lab experiments at Vanderbilt

as usual and also by branching out to other populations using Amazon Mechanical Turk to test online. This way we got a variety of ages, sociological and educational backgrounds, etc. (One limitation here was that all participants had to be at least 18, according limitations in the lab's IRB protocols. It would be helpful and interesting if we were also able to look at younger participants.) Our participants were almost 300 individuals from Vanderbilt (Nashville, TN, US) and around the United States as a whole (via AMT)

- We chose Barbies and Transformers as toys that have been around for a long time, increasing the amount of people who have exposure to them, either from playing with them themselves, siblings, children, or other exposures. They both are toys that have recognizable faces with many different "identities" or characters. And, they are toys where we can reasonably expect differences in experience between two groups (males and Transformers, Females and Barbies)
- For me, this study was more a stepping-stone piece, and has been a lot more popular than I expected (probably because we talked about toys and gender). I am interested in the neural bases for face/object recognition, and how the brain changes (whether neural connections or patterns of activity) as we become more experienced with certain categories. I hoped to use this as a first step of identifying experience differences in face recognition as a basis for future work (which is currently under review) using fMRI.

There is research that shows infants that are days old (iirc) are more interested in different objects depending on their gender. This has been interpreted as strong evidence for genetic gender differences in interests / visual recognition. Specifically, male children were more interested in complex, mechanical objects than female children (though I can't recall what female children were interested in).

How does this research inform your conclusion that the effect you found is a primarily social one?

I'm at work so I can't supply the paper, sorry. Maybe a friendly redditor can.

[ReverseSolipsist](#)

I'd love to comment more based on the paper you're references in particular. I'm probably going to be checking back a lot so if you or someone finds it, let me know!

There is some research we address (specifically Dennett et al., 2012 for one example) suggesting that mental rotation advantages lead to these differences. However, some work from the lab I worked with during my study suggest this might not be the best explanation (see here:

<http://gauthier.psy.vanderbilt.edu/wp-content/uploads/2012/03/McRiHeGaSp.pdf>)

The research from my study highlights the importance of experience in modulating these effects, as seen with Transformers and Barbies, which are marketed differently to different genders. If we could switch this, and give males the experience with Barbies, and females with Transformers, I'd expect we could see an experience-based "flip" in the findings.

Did you test any other types of toys? Anything that got cut instead of used in the study?

[skyzm_](#)

We chose Transformers and Barbies specifically, because they are two categories with clearly visible faces where we could get two sample groups (males and females) that had expected differences in experience (males more likely to have played with or interacted with Transformers, females with Barbies). At the time I was working with this lab, we were "brainstorming" a list of other types of

categories we might see differences.

This lab does a lot of work with object recognition, and have used a lot of different types of objects in similar work - from living objects like birds, mushrooms, leaves to non-living objects, like cars and airplanes, and even completely made-up objects! I'd be happy to direct you to that research if you are interested!

What are you working on next? Any plans to expand this study?

[heysayer](#)

I am very interested in how the brain changes as a result of experience changes (this is more my interest as opposed to toys ;)).

I am interested in examining patterns of brain activity, using fMRI, and how they change when you become an expert vs. a novice when recognizing different categories. There is a study I conducted that is currently under review that discusses how the FFA (a visual region in the brain) responds when an individual learns different types of faces and views scenery under different attentional conditions. I think this will be very interesting to share soon.

As of right now, I completed my MS at Vanderbilt and I am currently taking some time off before I finish my PhD. I would like to continue studying object learning using fMRI in the future.

Hello Ms. Ryan, I am a recent graduate from a psychology program nearby. I have a few questions for you about your research but also some about the academic pathway you went down if that is ok.

Does the ability of understanding and recognizing faces occur mostly in the fusiform gyrus; what other areas are of the utmost importance that are relevant to your study? What aspects are different about each hemisphere's fusiform gyrus and other subsequent important areas you may want to note, for example: prosody on the right side? What research funding has given you the most insight or has been the most interesting to you through your experience in developing this research? Finally, what made you interested in your selected field of study?

Thank you for your time. If you care to answer some more personal questions, continue. Also, while these are genuine questions that I would be extremely pleased if answered, I understand that this is not an anonymous AMA and any bad reflections on the institution to which you belong can harm your relationship with said institution. If you wish, I would be glad to receive a PM about any potentially harmful or personal opinions that you'd want to share in a more private forum.

Many people view Vanderbilt as a fantastic research university, but there are many people who are of the opinion that the bar to get into this university is set above where it ought to be asserted alongside the claim which states that there are in existence arguably better universities with higher acceptance rates for the same price. Do you see these claims as accurate/ legitimate concerns and representations of the institution? I am waiting a year before I apply to grad programs. While in between programs, I am looking to do some relevant work as a research assistant. This will boost my chances of getting into a PH. D (or a master's program at Vandy) program with a lower than average GPA. My question to you concerning admission is what were your credentials that got you admission to Vanderbilt for studying cog neuroscience? Are you working with fantastic professors and how relevant are their research interests to yours? Are there any other programs you believe are of equivalent value or greater to the one you're in at Vanderbilt?

Once again, thank you for your time.

[Jemiller](#)

Congratulations on graduating! Hopefully I can answer your questions, and if you have more, feel free to message and email me.

- The fusiform gyrus plays a very large role in processing faces and objects with which we have a large amount of experience. For research I have done that is currently under review and also hopefully work I would like to do in the future, we focus on mainly this and other surrounding regions (FFA1/2, OFA, PHG1/2, bilaterally). We find related activity on both left and right, but sometimes pronounced on one side, given different types of stimuli. Like many people in these research fields, I find the brain simply amazing: it can process the world around us so quickly and efficiently, yet remains able to learn and understand patterns. I'm interested in these patterns, how they arise, and how they are translated into brain activity. This study focused on in the AMA was really just a stepping-stone piece, but it seems to have become very popular!
- Vanderbilt is a great research university with amazing resources, faculty, and opportunity. I do not believe that the bar is set too high for graduate work (I cannot speak to the undergraduate experience in any way, as I didn't attend and had only a little time working with undergraduates). As a PhD student, you are generally accepted into programs and given tuition, living expenses, and possibly more depending on your circumstances, advisers, department, etc. so "price" is a little difficult to factor in. I was paid to attend graduate school and do research.
- I think waiting to go to grad school can be very helpful for many people. What helped me was my work in undergraduate. I went to a small, locally known liberal arts university in Virginia called Christopher Newport University. I was extremely lucky that during that time I had the opportunity to work in two very different labs, present at national conferences, and publish research. I believe this is what helped me to be accepted at Vanderbilt and other institutions. I believe the most important part in getting accepted to the graduate program of your choice is to show the faculty that you can be an independent, productive member of their lab and that you have the skills to hit the ground running from day one and keep learning along the way.

I'd be happy to chat more, privately, if you would like! There is certainly a lot to say, academia is an amazing albeit crazy place to be!

This is a very interesting paper, I really appreciate you being here! I have two concerns I would love to see addressed:

1. You argue that a crossover effect provides compelling evidence that a domain-general mechanism (stronger in women than men) explaining facial recognition doesn't capture the role of experience in shaping our face recognition systems. In more accessible terms, I take this as claiming that experience with one type of face doesn't improve 'face recognition' generally, but face recognition for that subset of faces. But it feels like no one in the field would believe that face recognition is as domain-general as this; the own-race effect itself (where people are better at recognizing faces of their own race) has already provided compelling evidence that faces aren't a 'neurally-basic' category in that way. So while your results do provide evidence for the claim you're making (otherwise we'd expect to see expertise with toy faces transferring to all types), do you really think it would be contested even before running your experiment?
2. I don't think your statistical analyses are sufficient for concluding based on your data that there isn't a general face-recognition advantage for women. An explanation of general advantage for women + domain-specific experience effect could also explain these data, with the general advantage for women being masked by the experience effect. It seems like the result you would really want is to show that there is NO gender difference after, say, regressing for experience. In fact, you still find the result, which suggests to me that either experience doesn't fully explain the effect, or self-report

is an insufficient measure for capturing experience. Either way, it seems like it makes this conclusion tenuous at best.

[Rhodopsin Less Taken](#)

Thanks for your thoughts!

1. The own-race effect itself helps to illustrate the role of experience differences. If you grow up seeing a certain type of face, you're going to be more likely to recognize them better than someone who did not. If you are a car expert, you are going to be better at identifying car models than someone who is not. So, why would a female-bias in face recognition not be explained similarly? Based on other studies I have read, yes, I do believe this can be a contested point.
2. Yes, we would love to be able to show that and that would be the ultimate goal. However, finding the right way to quantify experience is difficult, and is a whole field of research itself (I'd be happy to point you to some work from this same lab showing that). We do also mention in our discussion that our measure of self-report is not the best way, however, it is one that has been consistently used in other studies and therefore helps us to seat our study in the context of previous work. I would absolutely love to replicate these results with a more sound measure of experience, but what that would be is still in the works. This is why we chose an example of experience where we could reasonably assume a difference to compare.

Other work from this lab, and work I have done that is currently in the process and being revised as well, focuses on other categories where we can look at experience by training individuals with novel categories. Therefore, we know exactly how much experience each individual has with each category as we control it experimentally. There are downsides and advantages to both ways of approaching this.

Hi Katie! Thanks for doing this AMA! What was your favorite part about conducting the study? Also, how frequently did you have boys that recognized Barbies and girls that knew the Transformer's names?

[jeddai](#)

It was pretty fun to learn about the different types of toys. I didn't realize how many different "characters" of Transformers there were. I haven't seen any movies, never had the toys...

There were a few cases where, after completing the study, someone mentioned this for our in-lab portion of the study. In this case, they often described having siblings of the opposite gender who played with them. We didn't quantify this, but it is an interesting anecdotal note that gives some support to our overall belief that experience drives these differences!

What would the opposite hypothesis to yours say? That boys and girls come pre-wired to recognize / pay attention to different aspects of faces? It that they come pre-wired to recognize (differentially) actual different faces? Because both of those seem kinda silly.

[justPassingThroo34](#)

Correct. Some previous work suggests that there is some hard-wired differences that lead females to have an overall advantage in recognizing faces. This research tends to come from other fields, whereas a lot of work from the lab I worked with during this study focuses more on the development of experience leading to differences in face/object recognition.

What experiences contributed to the difference in recognition of gender differences regarding facial recognition? Which experience yielded the same results the most and the least?

[xTurtlex2595](#)

I'm not sure I totally understand your question, but hopefully this answers it:

In this study we aren't looking specifically at what leads to the differences in experience here. We are taking experience differences that exist in the real-world and examining those. Further research would be helpful in understanding more about these differences. For example, if we took two types of faces which have never been seen before, and we train people to recognize them, how much exposure and what type of exposure will be needed so that people recognize them as efficiently as other faces? I, and the lab I worked with during this study, have more work in progress/under review that addresses this.

Would this also explain why people from different races think they all "look the same" ? Or why normal people can barely recognize the differences in dogs.

[Apa300](#)

This is related! There has been work on the own-race effect and even own-species effect (I'd be happy to provide some resources if you want). While this has been well-researched, for some reason it had been less-so with looking at how experience and gender differences in face recognition relate.

In what ways does this account for non binary genders or gender identities? Transgender people?

[Endless Facepalm](#)

We did not account for this. We used gender here as a way to examine experience with our chosen stimuli (that males would have more experience with Transformers and females with Barbies). This is because our main focus here is on experience differences that modulate face recognition, we weren't necessarily focused on gender itself. I think this could be an interesting question for another study and another group whose focus is more on gender, but I expect the result would be, in general, the same: That the individuals who have more experience with a type of face would have more efficient skills in recognizing them, compared to those with less exposure/experience.

Did you watch us beat Tennessee and do you think that Derek Mason has earned his job for next year?? Anchor down

[jjaedong](#)

Not a football (I think this is what you're talking about?) fan. As a grad student I had very little "school spirit," I think I used it all up in undergrad :)

Thank you for the AMA i am interested in gender differences in early childhood before social ideas are adapted. I dont know if your research has gone in that direction, but if it has please let me know what you think the differences are between males and females.

[baronmad](#)

Here we were focused on how experience differences can lead to differences in face recognition, so

we were mainly using the gender groupings as a way to examine experience (because we can assume that in general, men would have more experience with Transformers and females with Barbies). I think that if we took children who did not have some expectation or influence of these social differences, and say, we trained males to recognize Barbies and females to recognize Transformers, we would see an experience-based "flip"

Hello! Very interesting article. I'm currently an undergraduate thinking about going into the field of neuroscience or psychology. What exactly are you doing for your career? I'm also interested in learning how experiences can shape our biological systems. Thank you and good luck!

[highhopes42](#)

Thanks! My ultimate goal is to stay in academia. I would like to work at a smaller university, where I have the opportunity to teach and do research (I really love doing both). Good luck to you as well - and if you have any questions about the graduate process, let me know!

You discuss men and cars, but what about women and a traditional girl non-human toy like My Little Pony?

Edit: typo

[1900grs](#)

We discuss men and cars because it is something that has been heavily studied before. I would probably expect a similar discussion between any other pairing of object and experience.

How does this experiment improve civilized man?

[Gbltrader](#)

It helps us to understand how we view the world around us, and what makes us see things the way we do. It makes us sensitive to how experience changes us and our brains.

As researchers, it is a stepping stone for future work on understanding experience (what it is, how much we need to be "experts" in something, what type of experience is most helpful, how to we talk about having it), and understanding how the brain changes as these behaviors change.

honestly, can't help but feel this is a beat around the bush way of coming into something where women use it to cry about how society is making them inferior instead of the real reason, which is that they were born inferior. i swear to god.

[whatnow00](#)

Completely not the point, motivation, or findings for this study. I hope you read many of the other comments here and the paper and see that our goal here was to look at face recognition.

Does the Quizznos in Carmichael Towers still have that really goofy manager?

[bbatwork](#)

I have never been in a Quizznos nor any of the undergraduate buildings :(

How many genders did you discover?

[ImASuperCool](#)

We're not focused on discovering genders here.

I'm not sure how your paper argues against women having a better domain general ability in facial recognition. It seems like, from your results, that any differences between sexes were very small, and possibly reached significance as a result of your sample size. I'd be interested if these results were still significant within the AMT and lab samples if analysed separately. Furthermore, I think you're stimuli are fairly imbalanced (transformers are much more detail rich), and the nature of the previous experience might help play a role in facial recognition of one toy or another. The experiences people of either sex are likely to have with Barbie toys is likely to be mostly tactile and come mainly from experience in playing with the toys themselves. Experience with transformers, however, is likely to come both from toys and also from viewing the original cartoon or the more recent films. So, while the transformers stimuli are more detail rich, so is the likely nature of previous experience with transformers. It seems as if, actually, women did very well in identifying transformer faces, despite a lower level of experience previously. The nature of transformers as well, is more intricate than Barbies; they morph into things. Essentially, they are more memorable. As experience with transformers correlates with transformer face identification in men, but not women, and given the very similar numbers for overall facial identification in the transformers task between the sexes, I think your results do actually support a domain general advantage for women here. Men may have higher rates, but this is clearly mediated by experience.

[ebhat](#)

We are stating that face recognition is based on experience with a type of face. So, we are not arguing that women are better in face recognition (this is what some previous work might say).

I think you make a good point about differences in types of experience. But we also don't know whether playing with a Barbie would be too different from watching the cartoons -- in both senses, people would still be differentiating and identifying the characters. We chose these categories because they have been around for a while and therefore could be experienced by different age groups and are widely known, with many different distinguishable identities. I think a lot of these points are good, but our data do not show that they are a problem in this study.

And you are right in your last sentence - it is mediated by experience. This was our point! I think we are on the same page here.

Is Gender Identity scientifically backed? The general thought is if you're born male, your male and same if you're female. Currently you've got people saying there's endless genders such as Milo Stewart <https://youtu.be/5zq1UWM7W0Q>. Can you possibly clarify this?

[Sound Flames](#)

I cannot speak to research about gender and gender identity, as my field is vision and cognitive neuroscience. I think there are people who can speak to this much, much better than I can.

However I do want to note that gender is not the key point of this study. Rather, we are focusing on differences in experience in a case where they are separated by gender.

Hi Katie! Thanks for doing this AMA. Are you familiar with the work of Cordelia Fine, and did any of her research or ideas factor into your approach to this project?

[onlyherefor5minutes](#)

I am not familiar with her work, but I will have to look it up! Thanks for mentioning it!

What's the most surprising thing the study shows?

[Uwaterloser](#)

For me it isn't necessarily surprising, because similar research in object recognition and with other types of faces (race, etc). Show the importance of experience. I think however, it can be surprising to some to see how flexible the way that we interpret the world can be! Experience shapes what we understand, and how well we view the world around us - it is a very powerful thing. There is going to be a lot more research in the future to understand "experience" and what it means, and how we can effectively change it.

In the paper you seem to use sex and gender interchangeably. Since the participants were self-reporting, did the questionnaire ask for sex or gender? With such a small sample size, and using mechanical turk, I could see the results being skewed by sex/gender differences.

[entcolin](#)

We learned a lot about gender/sex research along the way, as the lab I worked with at the time was primarily a vision research lab (we do not usually do so much work concerning sex/gender as others may). We asked people to report whether they were male or female, so gender is the best term here.

Our sample size was almost 300, both collected in-lab at Vanderbilt and through AMT. In comparison to a lot of similar research, our sample size is much larger and more appropriate for what we wanted to do. Having appropriate statistical power is often overlooked and is something that is getting more attention these days in psychological research, so we wanted to be sensitive to that. Ideally, we want to examine experience separately from gender, but finding the optimal way to have people report their experience is extremely difficult to do.

As far as I'm aware barbies have typically always been popular toys. I don't remember transformers being particularly popular when I was a kid in the 90s. I assume they were more popular in the 80s? And possibly have seen a resurgence recently due to the movie series, though I would also expect the designs to be pretty different.

Would this have an effect on the results? I really can't think of any male equivalent toy to barbie that has been uniformly popular across generations.

[prism1234](#)

It absolutely could. We chose Transformers because they were the best equivalent we could find to Barbies, given our goals. We wanted to find a toy that was geared towards males, that had a variety of identifiable characters, and had faces. This narrows it down quite a bit! It did work for us in our study though. The lab I worked with during this study has done a lot of research on face/object recognition

using everything from birds/leaves/mushrooms to cars/airplanes and even novel objects and novel-race faces.

Why your focus on gender in your paper instead of sex? Wouldn't it be more reasonable that biology would have more impact on, for example, differential brain connectivity than social constructs would?

[fooliam](#)

Our paper is about the role of experience in face recognition, where the difference is observed in males and females. My interests lie in how the brain changes as a result of experience (whether that be through regional connectivity or relative differences in activity). While there are, I'm sure, many biological differences that influence these processes, I'm interested in the experiential differences that we see that also influence our ability to recognize faces/objects.

Hi Katie! I was wondering what your background in philosophy is? Your interest in the role of categorization, recognition, and understanding in experience seems to have a very phenomenological dimension to it. I know Lisa Guenther teaches at Vanderbilt, and she is doing super interesting things with phenomenology. Wondering if there is any crossover?

[weedcakes](#)

Hi! I have no background in philosophy. My research has covered vision, face recognition, and cognitive neuroscience. I'd love to read more about her work though -- I love finding parallels and ties between different fields of research, which I believe is probably apparent in this study.

Have you ever been to bonaroo?

[vegasorHeaven](#)

No.

Could you not have found something more equivalent? Saying that Transformers faces are the same as Barbie faces is a bit of a stretch isn't it?

[pixelated_nutsack](#)

We're not saying they are the same, but they were the best tool for us to study experience and face recognition for our goals. Men treated them just as "face-like" as females treated Barbies. For those of us who don't have a lot of experience with Transformers, it can be hard to see that there are many distinguishable identities. The same is the case for Barbies: they have easily identifiable faces and identities. These were the best choices for our study, however, no study is perfect. We controlled the variables here as best we could given our goals and resources.

How to reverse bottom-up processing in men? It seems like every man in my family is a bottom-up thinker :(

[Hi_im_Khaleesi](#)

More research needed.

I took neuro at vandy in undergrad. leslie smith was a nutty professor

[Ha7wireBrewsky](#)

I never worked with her, though I was almost her TA once.