Diversity in the Economics Profession: Mapping Out a Plan of Action
October 30, 2014

AMANDA BAYER. It's an honor to work with all of you today in this room. Thank you for taking time out of your busy schedules to come together and think about the very important issue before us: diversity in the economics profession. I know and respect the work that many of you have done and I am excited to map out a plan of action with you. The Board, and in particularly Deputy Director Janice Shack-Marquez and Director David Wilcox have shown remarkable leadership in bringing us together today to open a profession-wide dialogue about diversity. The commitment displayed by all the officers I've met with here is invigorating and powerful. In this room, we have these esteemed Board staff, Federal Reserve Bank presidents and research directors, chairs of top, top economics departments from around the country, economists who have made significant contributions to understanding and addressing diversity, and leading scholars from other disciplines. We have the opportunity today to put our diverse heads together and produce lasting change in our profession.

Echoing the Chair's remarks, our objective is to create a profession that recruits and promotes the individuals best able to bring the energy, fresh insights and renewal that our discipline needs to be healthy and thrive. Over the course of the day, we will hear from a dream team of speakers and panelists who will share their research and their work on the ground. I am truly excited to attend this conference. They will expose us to examples of successful diversity initiatives in economics and around academia. The presentations will help us understand the impediments to diversity and will, importantly, introduce us to evidence-based interventions we can support. Listen with the goal of developing a list of actions and initiatives that you believe hold promise as being practicable and effective. In the afternoon, we will have opportunities to share and refine our ideas through group discussions. By the end of the day, each of us should

be able to identify several initiatives, large or small, which excite us. To make it concrete, set a personal goal of writing down two specific actions, one each at the personal and departmental levels, that you are willing to adopt to help our profession attract and develop the best people and best ideas.

In my talk this morning, I will provide background information and a framework to organize and develop knowledge through the rest of the day. All right. So, now I get to be a teacher rather than a speaker. I'm much more practiced at speaking. I want this to be an academic conference. I want us to converse. If you want to ask me questions during the presentation, feel free, afterwards or in conversation later. All right. So, my presentation has three parts. First, I present data on diversity in the profession and in the next section I briefly discuss possible consequences of having a more or less diverse profession. In the last section, I lay the groundwork for our plan of attack. I offer an economist's take on the diversity literature produced in a wide variety of fields, highlighting strands of diversity research that may be less familiar and connecting them to the logic and research that we economists have done. First, a note on the meaning of the term diversity. While certainly other kinds of diversity are important and productive, our focus today is on groups that have been historically under-represented in our profession and in our country - women, African Americans and Hispanics. The inclusion of people and perspectives from these groups is essential to the vitality of our profession and policymaking. But as we learn about the barriers faced by members of these groups, we develop general knowledge that is transferable, facilitating the inclusion of the best people and the best ideas from all groups.

Okay, so, can you hear me if I step away from the mic? Good. All right. How are we doing? What are our numbers? Well, big tech firms, heavy representation of the boys clubs.

Yahoo, all right, let's skip Yahoo for a moment. Google, Twitter, Apple. Seventy percent of their workforces are men. What do you think our profession looks like? What percentage of tenured and tenure-track professors at colleges and universities in this country are female?

[Inaudible audience comment. Laughter.]

AMANDA BAYER. Someone studied before the test. Okay. All right. .

[Inaudible audience comment. Laughter.]

AMANDA BAYER. True, true. All right. So, here are my numbers. My cute graphic. All right, so, calculated maybe slightly differently, but 22 percent in the most recent academic year are, tenured and tenure-track faculty are women. What about racial and ethnic minorities--black or Hispanic economists? What percentage do you think that is? Ten?

[Inaudible audience comment.]

AMANDA BAYER. Less than ten. Do I hear any others? Five. All right. These numbers, by the way, are from the UAQ. Some of you fill that out every year. Some of you don't. So, we do have a problem with response rate and missing data, but the numbers I calculate there are fairly consistent year to year and across other surveys as well. So, this is a, an accurate impression we're getting, an accurate number. So, maybe it's a legacy effect. Maybe over time we'll diversify a bit more.

So, let's get a sense of what the younger cohorts are showing. Looking at new PhDs over the last three, three years. Thirty-three percent are female. It's a pretty low number, and it does not compare well to other disciplines. What's happening in other fields is they're represented, political science 48 percent, STEM PhDs 50 percent female. Generally folks are surprised. Racially we see a similar pattern. For new PhDs, eight percent of new PhDs, this is looking at US citizens and permanent residents, are black or Hispanic. If we include temporary residents,

the total drops to 3 percent. In the other disciplines, 17 and 12 respectively across political science and the STEM fields. STEM means science, technology, engineering and math. I'm sorry?

[Inaudible audience question.]

AMANDA BAYER. Oh, sure, sure, sure. So, if the numbers here, 8 percent, 17 percent, 12 percent, exclude new PhDs by temporary residents. If we include those PhD recipients, the numbers drop to 3 percent, 13 percent and 8 percent. So, we do have a high participation rate in our discipline of temporary residents in PhD programs. So, maybe even younger cohorts will, will save us. All right, so let's move back a stage in the pipeline and look at undergraduate students. Any guesses?

[Inaudible audience comment.]

AMANDA BAYER. Better. All right, so what do you think the number is for econ majors who are female, what percentage? 30 to 40? Yes. How do you think that compares to the other disciplines? Poorly. Poorly? In a word, yes.

AUDIENCE MEMBER. Amanda, what's, in STEM, though, the breakdown really varies depending on whether you're talking about biology or physics, right? Because with biology, biology is the [inaudible].

AMANDA BAYER. Right. Right. So, depending on how inclusive we are when we consider what a STEM major is changes the number slightly but not very much at all. So, it is true physics is slightly less diverse than we are in these dimensions but not a whole lot less. And math, for instance, I think 48 percent of math majors are female. So, yeah, we're behind. We're doing poorly. All right.

Here, black and Hispanic econ majors constitute 12 percent. Political science 24. STEM 20 percent. Okay, well, maybe this is not great, but getting better. No. All right, over the last 50 years almost, we see the proportion of econ majors who are female. We experienced a sharp increase in the '70s but since have plateaued. There's really no reason to believe change will occur without distinct, intentional action on our parts. We see a similar message when we look at racial and ethnic diversity amongst undergraduate students. Economics is behind, behind all majors and specifically here behind political science and STEM majors. And there's little upward trend. Convinced that it was worth the trip today? So far so good? Or, so bad. So, we have a problem. Does it matter? I guess problems matter. We see data. Do they matter? What are the possible consequences of the numbers that we've seen, the lack of diversity in our discipline? Who are they [laughter]? Who are these people?

AUDIENCE MEMBER. They're Nobel Laureates.

AMANDA BAYER. Nobel Laureates in economics. 75 of them over the last 46 years. So, what are some possible consequences, just hypothesize. Speculate. What are some possible consequences of a group of economists not being as diverse as the rest of the population? Sure, anybody? You don't see yourself there. What effect does that have on students? Yeah.

AUDIENCE MEMBER. Well, I have something to say. It has two effects, one of which is that you've institutionalized a set of views that make it harder to make sense of the way the economists believe. So, in particular, for women and minorities, under-represented minorities in particular, you get an orthodoxy of belief that explained those differences. So, why do women get paid less? Why don't whites have high unemployment rates? All of that gets reinforced by the orthodoxy that does not have to really listen to challenges about how to explain very basic economic life as experienced by under-represented groups and that reinforces itself. Because

those of us that challenge that orthodoxy are way on the margin. We're not in the middle of the economy. And most importantly with this economy, in a very few short years, the majority of new workers will either be black or Hispanic. And, and in short order after that, the majority of all workers, not just new workers but all workers, will be black or Hispanic. So, who gets to determine understanding the experiences of black and Hispanic workers will influence whether we think 6 percent unemployment, 70 percent labor force participation makes sense. Currently there are a lot of people who are probably, given the orthodoxy, who argue that we're going to get lower labor workforce participation rates and that we are going to get higher unemployment rates and they will interpret that as structural. Because currently we believe black unemployment is structural. We think the women's labor force participation plateau meaning is structural. We don't think of it is as related to an outcome of our economic policy. So, it's very central because in a few short years, there are going to be people who are going to argue empirically, "Don't worry about this high unemployment rate because if black people are unemployed they're structurally unemployed. And don't worry about Latinos because they're not ready for prime time either." And, and we're going to accept higher unemployment rates, lower labor force participation. I mean, and the people who are going to argue that seriously believe that.

AMANDA BAYER. Thank you. So that's, so that's eloquently said, and captures I think all three of these dimensions of consequence. Or maybe six dimensions, right. The consequences of the lack of diversity in our profession are both inequity and inefficiency. It's not just about being nice to certain people, to include them in our fun work, but it's about getting efficient allocations through the people who join our profession, in creating the body of knowledge we are responsible for expanding, and in making government policy.

So, around the academy, within economics and outside, researchers have been looking at the consequences of not diversifying groups, right? The consequences of homogeneity and the research takes two strands. Well, of course we want to pull from 100 percent of the talent pool, that's a given. But it has consequences even beyond that issue, and I've kind of given you a couple of representative papers within each strand. The first strand says diversity brings a greater range of insights and perspectives. Right? If we have a broader group of people, we have a broader set of ideas. The second strand says there's something special about mixed groups. It changes group dynamics. The behavior of individuals is different depending on the composition on the group in which they're active. And yes, there are challenges to being a mixed group in communication, maybe in trust. But they are also distinct benefits as proved by laboratory research and on the ground. Now, some of the research has problems with looking for causation. But others very distinctly show that mixed groups are more successful in solving problems, especially complex problems, in part because the participants work harder, spend longer, prepare more than in homogenous groups.

So, I would be happy to answer questions about any of these papers later but at this point, I'm trying to give a high-level overview and let you know that details exist. I want to show you details from one paper. You may know it. May, McGarvey and Whaples recently surveyed all AEA members with PhDs working in the US. Oh, the PhDs from US economics departments. Pretty similar group, except they disaggregated survey responses by gender. I've chosen four items. There were many, many items, most of which had distinct statistically significant differences and responses. So, along the bottom I show statements and the respondents were free to respond on a scale of 1 to 5, whether they agreed or disagreed with the statement. So, for instance, you can see that women were 21 percentage points more likely to disagree with the

statement that the US has an excessive amount of government regulation of economic activity. Even more striking, my daughter said this is the only statistic I had to show all day, the statement "job opportunities for men and women in the US are approximately equal", 58 percent of female economists disagreed with that statement, 16 percent of male economists. In questions about economic principles and theory, there was similarity amongst respondents but disagreement on interpretation of economic outcomes and on recommendations for policy were different even after controlling. These numbers control for vintage of degree, place of employment, and so on.

So, we have a problem. That's the bad news. The good news is there's something we can do about it. What can we do? Well, we can patch the pipeline, or try. So, this is a familiar analogy to those working not only in economics but in many other disciplines for thinking about what happens to people on their way to us. And, you know, they might start in high school or college and move forward and perhaps take a PhD program on, and perhaps complete it, and then perhaps go into the academy and perhaps, in a tenure-track job, and perhaps get tenure and ultimately promotion. And there has been a lot of excellent research on that process, understanding why, perhaps, women and minorities leak out at higher rates than do others. There's been a lot of excellent work on initiatives designed to address those identified problems. But I think the framing of the issue as a pipeline causes us to think about a supply of people coming to us.

Now, we're sitting here, all settled in our profession, waiting for the supply to be delivered to us. And it takes attention away from what we could be doing. My students know, right? The solution to anything lies in supply and demand, right? There are two sides to every market, and we need to give more attention to the demand side of the market. And that's a little scary because when we think about labor market discrimination we think, well, on the supply

side there are human capital attributes and others and on the demand side there's animus and statistical discrimination. And that indeed may be happening, but it's a lot more, right? We present an environment and the people coming to us and through us are interacting with that environment. They're not acting in a vacuum. We have certain attitudes, beliefs, habits, culture that we're presenting and we need to reflect on and perhaps improve. So, here are some results from the literature on why women and members of under-represented minority groups may not be becoming economists at the rate that white men are. We've looked at math ability, competitiveness, yada yada yada. Role models begins to think about the dynamic between the identity of the students and the environment we present but there are other ways we can examine the environment. And so in the rest of my talk and perhaps in the rest of the day, you will hear about some of these other factors.

So, first, we can advance diversity by addressing implicit biases. Implicit biases happen without us knowing about it. Implicit biases are these automatic associations that we've been trained by society and media and others to make. So, a member from a particular group, we instantaneously associate with a particular attribute. It's outside our conscious awareness. So whereas animus-based and statistical discrimination characterize explicit, conscious choices, we're talking about another kind of action, another kind of decision that we make almost every moment. Because every moment we're bringing in, as the cognitive scientists estimate, 11 million bits of information and we only have capacity to compute or deal with 40 bits. So, these automatic associations take over. As you can see, this is linked to the literature now that we have been fruitfully incorporating into our work in the form of behavioral economics. So, psychologists and others show that most of the population is no longer explicitly biased, at least responses to surveys will show respondents denying explicit biases or revealing few explicit

biases. But most of us are implicitly biased. So, you know, just like you might associate green with go and red with stop. You know, we have these trained impulses. You can test yourself for your implicit associations by going to implicit.harvard.edu and they have a wide variety of tests you can take. They're kind of fun. These are just a few of the tests available. Do you make an automatic association between women and not science? Or women and science? You can find out, along with many other tests. Note that psychologists rely on responses to these tests to measure an individual's degree of implicit bias in various dimensions and associations. But they also have other kinds of tests to measure implicit biases where, you know, they hook subjects up to machines and measure heart rate and brain activity to identify when implicit biases or conflicts with implicit associations internalized have been identified.

Where do implicit biases come from? I pulled this from January's meetings. Now, many of you may not have noticed. I decided to make a big deal of it. All right, so this is for our great job market, and we have two white hands shaking. One might be a female because there are four buttons on the suit, I guess, but it sure doesn't look very female at least. It's adorned as a male. That hand is. So, I don't know whether this reflects implicit biases or just engenders them, but they're everywhere. And I want to say we are all implicitly biased. The research has shown that women are just as likely to be implicitly biased against other women as men are. So, it's not about pointing fingers. It's about examining ourselves and identifying where we might make associations that we don't want to be making and then taking steps to de-bias. And there are distinct steps we can take. So, there's oodles of experiments demonstrating implicit biases and how they affect decisions. Again, I can give you the details later if you wish but the professional decisions of physicians and police officers have been demonstrated to correlate with the implicit biases and seem to be heavily influenced by implicit biases. Certainly job market decisions of

many types have been explored with the lens of implicit biases. And there are other results which I think future speakers today will be discussing so I'll move on, and just note that there are things we can do about it. You will see more explicit interventions later. I hope to give you a sense, note that economists have acknowledged the present of, presence of implicit biases and have thought of ways to address them, so, Price and Wolfers look at NBA referees. And because that's a snap judgment that a referee might make in the moment to decide whether to call a personal foul on a player or not, it's thought to be generated by an implicit bias rather than by some long thought-out decision involving statistical or animus-based discrimination. And there was a pattern of behavior, a perverse pattern of behavior where referees were less likely to call fouls on own-race players. This study got a lot of attention. And the referees want to do their job. They want to be impartial. And so then the economists went back and collected more data after the publicity storm, and the bias was gone. So, that gives hope that there are things individuals can do to de-bias. Awareness is the first step. Other general strategies include time, clarity and accountability, where accountability is just the idea that after you make a decision, hold yourself accountable for it. Explain to yourself why you made that decision. Why did you reject that candidate? It wasn't just a feeling. You better have specific reasons you can tell yourself. That makes it a less likely biased decision if you're going to have to do that in the future. And training. As I said, there are many steps, explicit, evidenced-based steps you can take to de-bias. The Bank of England is offering training on implicit bias to all of its officers and as of two years ago got through a third and so I imagine they've completed the rounds. Second, we can advance diversity by being attentive to micro inequities. The idea that, you know, that in every interaction there's potential for unfair and inefficient treatment. It's not just at the formal gateways to our profession. It's not just when we are deciding whom to hire or interview or

which students to accept in our programs, but it's a day to day, moment to moment kind of interaction where we might have the opportunity to stop and chat with a student in the hall or to respond in a constructive way or a personal way to their comment in class. So, recently researchers conducted a field experiment in academia. The subjects were over 6,000 professors working in PhD programs across all disciplines in top universities, and they got an email. Each of these professors got an email from a fictitious student. The student requested a meeting to occur in a week for 10 minutes to talk about the possibility of entering the program, specifically or in general, but the only thing that varied across the emails was the name of the student making the request. And the names were tested so that they were well identified with respect to their gender and race. The results? I think it's pretty impressive so many people responded to this anonymous student, but significantly, statistically significant differences and response rates and meeting acceptance rates between white males and all the others. So, it's not just Emily and Laquisha who are getting differences in treatments. It's our students. So, a bit more detail, the lurid details of this investigation. Disaggregating by general category of discipline, you see business programs have the biggest discriminatory gap. So, just so you can read the table, it indicates that 62 percent of women and minority students got a response, 25 percent more, i.e., totaling 87 percent of Caucasian males, received a response. We are down in the social sciences group, which includes economics plus 18 other disciplines -- psychology, urban studies, criminology, area studies, gender studies, the like. So, I begged but I did not get data for economists from the researchers. So, I respect that. But in a way, it doesn't matter. In a way we should be attentive to micro inequities and implicit biases regardless of what group averages are. We need to, we have the obligation and the power to examine our own behavior and improve it. And I'm talking to myself as much as to you. Please don't get me wrong, okay? The researchers

did find correlations, higher paid professions, private universities were more likely to, or had bigger gaps, discriminatory gaps. They also discovered that higher percentage female or minority disciplines had no bearing on the discriminatory gap. A woman contacting a woman or a member of a particular racial and ethnic group contacting a professor of similar group, no bearing, except for, I think, Chinese males did benefit from contacting a Chinese professor. By the way, Chinese students were the most discriminated group in this group but all racial and gender groups experienced discrimination for the most part, except Caucasian males. All right. Next category. We can advance diversity by re-examining our rules and practices. All right, so sometimes you see the advice, and it's not bad advice, that recognizing the role that implicit bias plays in our behavior, the solution is to make more rules so there's less scope for our impulses to take over. But we better be darned careful about making those rules because rules and practices and habits can embody discrimination, racism, sexism themselves. So, just like a facially neutral practice like voter ID laws can have disparate effects on different groups, so too can our explicit and implicit rules. More of a problem than a solution, but there I write, "Rules, habits, practices and culture can systematically and unintentionally advantage or disadvantage members of particular groups." So, these are not only explicit rules but implicit ones. Rules of thumb we use. My favorite paper on the topic is by Ian Haney-Lopez from the Yale Law Journal in 2000. And of course he was looking at whether the practice was legal under current statutes. But he found that grand jurors in LA County were at the time I think five or six percent Hispanic whereas the population was over 40 percent Hispanic, and there were these great disparities in who was making judgments on defendants and who the defendants were. And there was lots of testimony by the judges whose job it was to appoint grand jurors. And they sincerely and honest Ann said that they did not intend to discriminate. But the effect was discrimination, and it was

discovered that, you know, the rule of thumb for finding grand jurors was to use social networks so that you could find people who would do good jobs and take the position responsibly. But using that practice had the effect of creating disparity and disadvantage for members of certain groups. So, we need to think about in our own lives what habits or rules of thumb, or written rules, we use to make decisions and whether they, too, can be creating, unintentionally, disparities. Lastly, and this is kind of a living out, or an attempt to live out recommendations from the other three points.

We can advance diversity by changing the way we present economics to students. And I know not all of you are teachers here but I want to introduce you to my project that Janice kindly mentioned earlier. It's called diversifying economic quality, short Div.E.Q, which is an online resource promoting inclusive, innovative and evidence-based teaching practices in economics. It's a Wiki, right? So, people send me ideas. Of course, my students and I and my colleagues research and, and cover a lot of useful ideas, teaching tips to give professors and departments, but it's also a forum where we can exchange ideas as for how to improve our interactions with students and our students' connections to our discipline. Because as you saw from the numbers, we have a problem at the undergraduate level and I think there's something more we can do to attract a more diverse body of students to our very excellent discipline. So, here are some ideas under the front page of the resource. I don't know if you can see it from where you're sitting but I'll just read out a couple of points. It gives you tips for how to incorporate inquiry-based learning into your classes. How you could take an implicit association test to detect any implicit associations you might be making. How to offer wise criticism. I think a speaker later today will be talking about that. And so on. So, there are large and small things you can find here, and we also present an assessment of the evidence. Some of these strategies have been documented

as being better for students. They're evidence-based strategies. Better for all students, and often particularly for students who are female or racial and ethnic minority. Members of under-represented groups do very well when we think carefully about how to make economics relevant to their lives. So, here's a summary of my talk. We're not very diverse. Increasing our diversity would enhance efficiency and equity. And we can work on the demand side. We can change the environment we create. It gives us something to do, right? Not that we didn't have enough, but, you know, we have the power and the obligation to do all we can to address the system, or situation. So, those are the four points. And now I'd like to end with a guidepost for where we can go the rest of today and in months ahead. We'll be getting more instruction and prompts throughout the day, just a way to organize productive conversation but to get a mindset prepared, I really would like you to identify a partner right now and exchange email addresses, and commit to following up with your partner in January to see if you've actually done anything that you're potentially committing to do today. Second point, commit to do today, at least one personal and one departmental initiative. And then of course I think you've seen and on the tables or elsewhere we have a, or the Fed, the Board has set up an email address. So, at any moment now or in months ahead you can send questions or comments to the Board and we promise someone will read them and respond, all right? So, I, I'd love to take questions but at this moment, find a partner and exchange contact information, please.

[Multiple voices]

So, just a couple notes. I love the energy, so I want to make two notes, organizational notes. One is on each table there's a tent giving you the email address and a hashtag if you're a tweeting type. I know Lisa Cook is tweeting out the conference. Others can as well. I am prepared to take questions now or in private conversation later. Any questions pressing? Yeah?

[Multiple voices]

Here we go. All right. So, there's a question. I'm sorry to, like, cut the flow of conversation but I promise that there'll be plenty of opportunities to talk more. I really like it. All right. So, the question is about this slide.

AUDIENCE MEMBER. Hello. So, diverse groups are more innovate and they're more successful in solving problems. However, what the research also shows is that these groups don't notice this themselves. So actually when you ask more diverse groups in the lab after they have made these better performance, they think that they performed worse. And why do they think that they performed worse? They think so because they had a sort of unpleasant experience. There was more disagreement in the group. There was more discussion. It took longer to reach this better decision but it took, took them longer and it, it involved more energy from their side. And that is something I think we need to think a lot about. How can we make, how can we make people like diversity? How can we make ourselves like diversity? How can we step out of that comfort zone? And that, I think, is just as an important point to make here as not, not only concluding that more diverse groups are more innovative and, and make better solutions, reach better solutions, but also that they don't notice. How can we make them notice?

AMANDA BAYER. Great, great. Thank you. Any other questions or comments? Yes?

AUDIENCE MEMBER. Are you going to post the slides?

AMANDA BAYER. Sure, I'll post them, I think Janice said that the Board would be hosting, okay, we'll work on it.

JANICE SHACK-MARQUEZ. We can share them with everybody who's here.

AMANDA BAYER. Okay.

AUDIENCE MEMBER. I like the meaningful things you can do to address implicit bias. One of the things I do is I have students on their exams put their student ID numbers, not their names. A lot of people have probably tried that and I, I believe it works. But I've, I've read a little about and heard a little about letters of recommendation bias.

AMANDA BAYER. Yes.

AUDIENCE MEMBER. And one of the things my colleague from the psych department taught me to do is to have a checklist. For specific jobs I would have a checklist of skills regardless of the applicant skills that would be valuable to the employer and make sure I go down the checklist. Because the data shows that faculty describe women much differently than they describe men.

AMANDA BAYER. And they write shorter letters.

AMANDA BAYER. So, just basic, basic rules like that that are neutral can be quick to do and make the job easier.

AMANDA BAYER. Great, thank you.

AUDIENCE MEMBER. I have a question. That as we present information about females that it really is important to also have a separation of, it's important to have a separation of minority females from Caucasian females. I saw all your information you provided was on females. Did you or did the people who did these different studies and research, did they separate it out to see if there is a, still a bias even more so that impacts minority females versus non?

AMANDA BAYER. Right, so, in reality, these intersections are really important and the experiences of white women on average are different than for women in other racial and ethnic groups. Sure, so, some of the studies I showed only did the gender dimension. Some did only

racial or ethnic dimension. The one study on professors' response had enough observations that they could disaggregate by race and gender. That's a numbers problem that a lot of research has. So, we have to kind of extrapolate what we learn by studying some dimensions of difference to what possibly might be going on in others.

AUDIENCE MEMBER. I'm Donna Ginther. I've done some work on women of color in science. And what we found is that, that the sort of binding constraint is more race than gender, and so if you have gender parity, you know, if you look at life science. You know, 50 percent or over 50 percent of PhDs are in, in life sciences go to women. But if you look at women of color and life science, it's, it's the race dimension that affects their success relative to, to the gender. And a colleague of mine calls this distance from privilege in that white women are much closer to privilege, which we view as white men compared with women of color.

AMANDA BAYER. Thank you.

AUDIENCE MEMBER. I just wondered if you also have available to distribute a breakdown of the initial statistics you gave that also show family income or resources in addition to race and gender, just to see what the breakdown is there as well. Because one of the barriers may also in addition to race and gender may have to do with income and I'd just be curious to see how, how important that is. And it may not break any which way but it'd be fun to see it.

AMANDA BAYER. Right, right. So, in that way, gender is a controlled experiment because generally the income backgrounds are the same across genders. Those particular data don't have that information associated with them but I think there are studies. I could look them up for you.

AUDIENCE MEMBER. I was just wondering, I wish I knew, I was just wondering if anyone here knows essentially when these college majors are chosen. Sam and I were discussing

it. Your statistics suggest that the problem exists already in college, so well before even graduate school or, or things like that. And, and where are good times to intervene to assist, you know, in, in getting a more diverse group of students into economics?

AMANDA BAYER. So, I know of interventions, as the microphone's being passed, I know of interventions that start as early as high school. I think Jane Katz is in the room who does math, yeah, the Board Does Math by Econ, is that how we say it out loud? And so the Board has a, a program in here and at various reserve banks that you might know about, and to try to get, I think, under-represented groups more excited and knowledgeable about econ earlier. Most of the interventions, we hear about some awesome interventions today and most of them do take place, I believe, at later stages of the pipeline. There's the, well, I think we'll hear about the summer program which is for college students and then the DivEQ that I do is at that level.

AUDIENCE MEMBER. So, I want, I have a paper coming out any day now about women in academic science careers, and we were looking specifically at mathematically-intensive fields including economics. So, we separated economics out from the rest of the social sciences. We have a figure in our paper that shows the number of PhD students, the percentage of PhD students female and the average GRE quantitative score, and it's a downward-sloping line. So, you have economics, engineering, and math. You know, the percentages of females are low and the quant scores to get into graduate school are high. And one of the recommendations from our paper is that it's math, it's math that starts early, middle school and high school. Because by the time they get to college, they may not even be able to, to take those college courses necessary to be successful in these mathematically-intensive fields.

AMANDA BAYER. Yes. Let's, we'll make this the last question, thank you.

AUDIENCE MEMBER. Just, in relation to the question. So, there's a recent, it was like previous issue of the SEJ has an article examining the role-model hypothesis mainly, but they have a nice identification strategy where they use visiting professors who are not, or new professors that are not assigned when the students register, just to see whether gender matters. And so it doesn't seem that it matters then, which, and it can suggest that it starts before the major declaration and before college. So, it was kind of disheartening to read that paper because of that, right? So, like maybe by the time that they get there we're too late.

AMANDA BAYER. Well, I know of a paper that uses the random assignment of students to professors at West Point. I think Paige Carol and another author looked at that and saw that while male students weren't affected by the gender of the professors, female students definitely were in major sciences, STEM fields, maybe even econ as a result of that early exposure to a role model. So, there are things in the profession we can do. I'm, I think we have so much more to learn and with random assignment experiments producing so much information on the nature of the barriers and the implicit bias and whatnot that exists in our environments, that we can really make progress both in our research as economists but also in our actions and procedures as economists. I said that that was the last question but I see another hand. Okay.

AUDIENCE MEMBER. When does the bias start? I taught in the Algebra Project. There's a concern that African Americans are tracked out of college through math and this starts in the seventh grade. So, I was teaching seventh grade. So, I noticed that the women in my class, this was in Oakland, California, this is when I was in Berkeley, and it seems as though the women in my class were suffering in the same way. The, the girls in the class were suffering in the same way. So, I think it starts about that time. There were definite roles that were assigned to boys and girls before I got there and they, after, I'm not saying that I'm the intervention but,

just to be clear, but it was a summer program and you didn't see these dramatic differences in women and girls speaking up and, and participating in problem solving, and in public problem solving. So, I think that it's much earlier than, than high school.

AMANDA BAYER. Great. But there are steps we can take, then, to counter those forces that may be present before we see our students. Good. All right. Sorry, thank you so much. We have a 15-minute break. At 10:30 our next speaker will begin.