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**Women and Economics Workshops Run by Gary Becker and Jacob Mincer at
Columbia University and the University of Chicago ***

by

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Abstract

In the period 1960-1980 Gary Becker founded workshops for graduate students in economics, first the Labor Workshop at Columbia University and then the Applications of Economics Workshop at the University of Chicago. The workshops fostered novel applications of economics dealing with labor, consumption, household production, household formation, human capital, crime and politics. We document the high proportion of women in these workshops, comparing (1) Columbia to Chicago, (2) the Columbia Labor Workshop over various periods, under the leadership of Becker, Mincer, or both, and (3) the Becker-founded workshops to other workshops at Columbia. We estimate regressions of the odds that a PhD was awarded to a woman for students at Columbia or Chicago who graduated between 1960 and 1980, as a function of whether and when the student participated in a Becker-founded workshop. Tentative explanations are offered for inter-university and period variation in odds that graduates were women. In addition, we compare gender ratios of graduates from Columbia and Chicago, where Becker-founded workshops were available during all or part of the period, with that of students at universities located nearby, NYU and Northwestern, where Becker did not found workshops.

*Acknowledgements: Beller and Grossbard thank Gary Becker for founding the workshops we attended while studying for our PhDs, Barry Chiswick for suggesting some of the data analysis we are presenting in this paper, and James Heckman, Barry Honig, Shirley Johnson Lans, Anna Sachko Gandolfi, and Cordelia Reimers for helpful comments or information.

1. Introduction

Many find the low proportions of women in the economics profession a cause for concern. What stands behind these low proportions? To shed some light on the topic we examine the presence of women in the first two decades of operation of workshops for graduate students established by Gary Becker: the Labor Workshop at Columbia University (henceforth Columbia) and the Applications of Economics Workshop at the University of Chicago (henceforth Chicago) in the 1960s and 1970s. After Becker was awarded the Nobel prize in economics, Victor Fuchs (1994) wrote that “Becker has probably helped more women earn Ph.D.s in economics than has any other Nobel Prize winner.” In 2001, James Heckman was cited for noticing a high proportion of women at Columbia’s Labor Workshop (Grossbard-Shechtman 2001, Grossbard 2006). When he arrived at Columbia in 1970, he estimated that about 50 percent of its participants were women.

We examine whether these statements are compatible with data on the gender of those who obtained PhDs in Economics and participated in one of the two workshops founded by Becker at Columbia and Chicago in the period 1958 to 1978. We collected data on these students’ participation in either the Labor Workshop at Columbia, founded by Becker in 1958, and led by him, Jacob Mincer, or others, or the workshop in Applications of Economics that Becker started at Chicago in 1970.

The period under study corresponds to the first twenty years of Becker’s career and saw the publication of most of the work that was cited by the Nobel committee when it awarded Becker a Nobel prize in 1992. Becker integrated both Lionel Robbins’ “*scarcity*” definition of economics (Backhouse and Medema, 2009) and a Marshallian idea of *Altruism* (Medema, 2015). He helped transform economics as a discipline, and Chicago-style economics in particular, from a school of thought focused on prices and markets, and the organizations surrounding their operation, into a “choice-centered” discipline (Medema, 2011) studying decision-making and social behavior. Becker joined

Columbia in 1957.¹ He later encouraged his department to hire Mincer. In the sixties they each made major contributions to the economics of households and the economics of human capital. Both are often considered as founders of *Modern Labor Economics* (as it was termed when Mincer received the IZA prize in 2002) or *Analytical Labor Economics* (as termed by Heckman 2006). They also founded what could be called *Modern Household Economics*, that some have termed the *New Home Economics*.² This includes the economics of marriage.³ Their highly-cited articles on household and labor economics published in the period 1960 to 1974 include Becker (1960, 1964, 1965, 1973, 1974), Becker and Lewis (1974) and Mincer (1962, 1963). At the same time Becker also became one of the pioneers in economics of crime, law and economics, and economics of politics. They continued to publish important work on related topics throughout the period under study.⁴

After founding it in 1958, Becker directed the Labor Workshop at Columbia by himself for about 5 years. Subsequently, Becker and Mincer co-directed the Labor Workshop for about 5 years and then, after Becker left for Chicago in 1969, Mincer became its principal director. This variation in leadership allows us to establish how the representation of women among graduating PhDs varied as a function of whether Becker or Mincer were principally in charge of the Becker-founded workshops.

In addition, we obtained data on students who graduated from other universities with PhD programs located in the same cities, NYU in New York City and Northwestern in Chicago, where neither Becker nor Mincer ever taught or ran workshops. Our total sample consists of all 1274 PhDs in Economics awarded by those four universities during the period 1960-1980,

¹ Source: Gary Becker's webpage on the 2012 version of the website of the Becker Friedman Institute <https://mfidev.uchicago.edu/about/gary-becker/>

² The term *New Home Economics (NHE)* was coined by Marc Nerlove (1974), suggesting a connection with Home Economics (Becchio 2019, Le Tollec 2020). Today some use the term to refer to models analyzing household decisions as the result of family utility maximization (e.g., Le Tollec 2020). Grossbard (2001) defines it "as any economic model analyzing household decisions".

³ More about part of Becker's theoretical models on marriage and family can be found in Grossbard (2010).

⁴ See Becker (2006) on the personal ties between Becker and Mincer as scholars.

830 of which were awarded by Chicago and Columbia. For the entire period under study, 1960 to 1980, Columbia awarded a higher percentage of all PhDs in Economics to women relative to the other institutions; that percentage was always significantly lower for Chicago. During the early years of the Becker-founded workshop at Columbia (1960-65), 13.8 percent of all PhDs awarded by its Economics Department went to women (though none through the Labor Workshop), while only 8.3 percent did so at our other NYC institution, NYU. A sparse 2.3 percent of the PhDs in Economics were awarded to women at the University of Chicago from 1960-1971.

We find that participation in a workshop founded by Becker is associated with a significantly higher probability of a PhD going to a woman: odds that the graduate is a woman are 5.6 times higher if the graduate participated in a Becker-founded workshop than in another workshop at Columbia. This positive association holds for Chicago as well as for Columbia, but is stronger for Columbia. Moreover, the association for Columbia did not weaken after Becker left for Chicago and Mincer was principally in charge of Columbia's Labor Workshop. In fact, after Becker left the odds that a graduating PhD who had participated in the Labor Workshop was a woman were even higher than when or where Becker himself directed a workshop he had founded.

The next section expands on this history of the workshops founded by Becker. In Section 3, we discuss the data and present the descriptive statistics. Section 4 presents the data analysis and offers a discussion of the principal findings. Finally, Section 5 concludes.

2. The workshops that Becker started at Columbia and Chicago

Columbia. Becker established the Labor Workshop at Columbia in 1958.⁵ The first PhDs awarded to students after participating in Columbia's

⁵ According to the Columbia Course Catalogs in the Columbia University Archives, it was started as the Labor Seminar and was later renamed a couple of times.

Labor Workshop were awarded in 1964 (to John M. Owen and Morris Silver).⁶ They, and the other early PhDs who graduated after having participated in the Labor Workshop were all men; it wasn't until 1967 that a PhD was awarded to a woman who had participated in the Workshop, namely Shirley B. Johnson (who later became Lans). Johnson had attended regularly starting in 1962 while holding academic positions in the area.⁷ In 1970, a second PhD was awarded to a woman who had participated in the Workshop (June (Cohn) O'Neill). After that, many women attended the Workshop and were awarded PhDs based on research they undertook as members of the Workshop.

Table 1 summarizes how we defined three periods for Columbia's Labor Workshop. We assume a lag of two years (in some cases, it was actually longer) between a student's participation in the Labor Workshop and their calendar year of graduation with a PhD. Year of PhD graduation determines presumed years of participation in a Becker-founded workshop at Columbia. The following periods are defined in terms of who was primarily responsible for running the Labor Workshop at that time:

i/ *Becker-only Workshop: from onset of the Labor Workshop at Columbia until Mincer joined officially as co-director in academic year (AY) 1964-65.* Becker arrived at Columbia in 1957. He began the Workshop in 1958 and ran it alone through AY 1962-63, after which he was on leave for a year. Therefore, the first period, taking into account a lag of two years between students' workshop participation and their graduation, lasts from 1960 to 1965.

ii/ *Becker and Mincer Workshop.* There is evidence that Mincer had been attending the Workshop regularly while he was an assistant professor at City College (CCNY) in the years 1958-60 and after he joined Columbia's economics department as an associate professor in 1960.⁸ We examine whether his becoming co-director officially made a difference by creating a category for

⁶ These were the earliest PhDs from the Workshop that we were able to identify based on the title of the dissertation and recognition by other students of their having attended the workshop (Beller and Grossbard, 2019, Table 1).

⁷ Pers. comm. from Shirley Johnson Lans to Shoshana Grossbard, by email, Aug 23, 2021.

⁸ The source for these dates and titles is the introductory chapter of Teixeira (2007), p.10.

the period that Becker and Mincer ran the Workshop together: from 1964 until Spring 1969. In AY 1969 Becker moved to the University of Chicago, first as visiting faculty. He stayed there after he obtained a permanent appointment in AY 1970. In terms of graduation years, this second period corresponds to 1966 to 1971.

iii/ *Mostly-Mincer Workshop*. From AY 1970 to AY 1978, corresponding to graduation years 1972 to 1980, Mincer was principally in charge of the Labor Workshop. Occasionally, some other faculty ran the Workshop with or without Mincer: Columbia PhD William M. Landes ran the Workshop with Mincer during AY 1969-70 and with another Columbia PhD Barry R. Chiswick during AY 1970-71.^{9,10} During academic years 1970-73, James J. Heckman regularly attended the workshop as a new faculty member and took over for Becker on a number of PhD dissertation committees.¹¹ In the earliest Post-Becker years, Becker's influence was still strong, as a majority of students who graduated in the years 1972 to 1975 had taken Becker's course in Micro-Theory.¹² In the case of at least one student, Marjorie Hansen Honig, Becker was originally her principal thesis advisor, but after Becker left for Chicago Mincer became her principal advisor.¹³

Chicago. Becker established the Applications of Economics Workshop at Chicago in 1970. Here we principally distinguish two periods: pre-Becker and after Becker started his workshop in 1970. The first students participating in the workshop graduated in 1972.¹⁴ We stop data collection with students who participated in the workshop by 1978 and graduated by calendar year 1980.

⁹ The source for this information are the Columbia Course Catalogs, Columbia University Archives.

¹⁰ Both Landes and Chiswick had been students of Gary Becker and thus would have carried on his tradition in the Workshop.

¹¹ Pers. comm. to Beller from James J. Heckman by email, January 17, 2021.

¹² One of us (Beller) attended the Columbia Workshop starting in 1970 and at least until 1973.

¹³ Pers. comm. to Grossbard from Barry Honig, by email, November 28, 2021.

¹⁴ One of us (Grossbard) attended the Chicago Workshop in the years 1974-1976.

3. Data and descriptive statistics

Data

We extracted data on all PhDs awarded by the Departments of Economics at four universities (Columbia, Chicago, NYU, and Northwestern) for 1960-1980 from ProQuest. For Columbia, we supplemented it with data obtained from the Columbia University archives;¹⁵ for Chicago, we verified information about PhD graduates with the help of the University of Chicago's on-line Library Catalog. Our sample consists of 1274 PhDs awarded by the four universities during this period, the majority of them (830) by Columbia or Chicago. In the case of Chicago 24 out of the 444 earned their economics PhD via the Business School.¹⁶

Data on participation in a workshop founded by Becker was collected as follows. For Chicago, we used written records of the papers presented at the Workshop in Applications of Economics for the period 1970 to 1978.¹⁷ We defined a participant in Becker's Chicago workshop as a student who had presented at the workshop during that period and obtained a PhD by 1980. Becker was not always the principal advisor of a student who participated in his workshop, but at a minimum he advised the student as part of the workshop discussion.

Such written records on presentations were not available for Columbia's Labor Workshop. Instead, we used a variety of methods including personal observation by one of us (Beller) and answers to questions we asked of confirmed participants in the Workshop. First, after examining the titles of dissertations of all PhD's awarded by the department between 1960 and 1980,¹⁸ we selected out those that could have been classified as Labor Economics

¹⁵ In the case of Columbia, ProQuest came up with some PhDs who had not graduated from the Economics Department; we used the data from the archives to clean the data to make sure the PhDs were all from the Economics Department.

¹⁶ We included them in our sample because one of them participated in Becker's workshop. This implies that all those who got a degree after 1972 were potential workshop participants.

¹⁷ Shoshana Grossbard obtained a list of all Applications of Economics workshops organized by Becker from the time he got to Chicago until the workshop programs were posted on line. These records had been collected by Becker and his secretaries.

¹⁸ Using records of annual PhDs awarded from the Columbia Archives.

broadly defined. Then we asked confirmed participants from that time period if they recognized any of the authors of those dissertations as having attended the Labor Workshop regularly. If at least one confirmed participant identified the person as having attended regularly, we accepted that individual as a Labor Workshop participant. We added several people by this method. In some cases, we learned from our confirmed participants that authors of dissertations classified as Labor Economics had not attended the Labor Workshop.^{19,20} At Columbia, most of the students who attended the Workshop had Becker or Mincer as their principal advisor. A small number had Heckman as their dissertation advisor during his brief stay there.²¹

We first present simple comparisons using means and percentages.

Descriptive statistics

Table 2 reports the proportion female among all graduates with a PhD in Economics from all four universities for the entire period 1960 to 1980—two universities in the New York City area (Columbia U and NYU) and two universities in the Chicago area (U Chicago and Northwestern U)—and for the subperiods defined above. Over the entire period, 10% of the PhD graduates in Economics from all four universities were women. Columbia stands out: between 1960 and 1980, 15.5% of all of its PhDs in Economics went to women, whereas at the University of Chicago only 4.7% went to women. The proportion female among Economics PhDs at Northwestern was a close second to Columbia at 13.1%. At NYU, the proportion stood at 8.6%.

By sub-period, at Columbia, the proportion of PhDs from the department awarded to women did not change much between 1960 and 1971, hovering around 14%. It then rose to 18.5% in the years 1972-80, with a notably higher percent in the early to mid-seventies (22%) than in the late seventies (12%). At

¹⁹ Thus, while it is possible that we committed errors of omission, it is highly unlikely that we committed errors of commission.

²⁰ In contrast, Teixeira (2021) counted all students who wrote a PhD dissertation at Columbia on a topic usually considered part of Labor Economics as having attended the Labor Workshop. This leads to an overcounting of students having attended the Workshop.

²¹ Beller was his first PhD student.

Chicago, the proportion female rose substantially from the years 1960-71 to 1972-80, from 2.3% to 7%.

Table 3 reports the proportion female among participants in a Becker-founded workshop and among all graduates at Columbia and Chicago. It also reports the percentage of all graduates who participated by gender. In Panel A, cols. (1) and (3) report the proportion female among those who participated in a Becker-founded workshop at Columbia or Chicago and graduated with a PhD within the specified period (the entire period under study and each subperiod) with the total numbers of student workshop participants (in parentheses). For comparison purposes, cols. (2) and (4) report the corresponding proportion female and number of graduates for the entire economics department. For the whole period 1960-80, nearly the same total number of students participated in a Becker-founded workshop at Chicago as at Columbia (42 versus 45), but over a shorter period of time²², yielding a sample total of 87 students who participated in a Becker-founded workshop.

For the entire period 1960-80, at Columbia the proportion female among those who participated in the Labor Workshop is almost three times higher than that among all graduates (42.2 % versus 15.5%). The corresponding proportion female participating in Becker's Applications Workshop at Chicago, albeit substantially lower, is also close to three times higher than the proportion among all graduates (14.3 % versus 4.7%).²³

Breaking the total down by sub-periods, the proportion female participating in Columbia's Labor Workshop evolves considerably over time. In graduation years 1960-65, corresponding to academic years 1958 to 1963, the Becker-only period when Becker runs the Workshop alone, the workshop was small with zero percent female.²⁴ For graduation years 1966-71, corresponding

²² This is partially a function of Chicago's larger class sizes: a total of 444 students obtained PhDs in economics from Chicago in 1960-1980 (of these 24 received a PhD in economics via the Business School), whereas 386 obtained PhDs in economics from Columbia.

²³ These proportions female are high compared to averages for the economics profession around this time (see Kahn 1995).

²⁴ According to our data (Beller and Grossbard, 2019, Table 1), during this period only two PhDs were awarded to students who had participated in the workshop (John M. Owen and Morris Silver). Shirley

to workshop participation years 1964 to 1969, when Becker and Mincer run the Workshop jointly, the largest group of students (24) of any period participated in the Workshop and earned their doctorates. Six (or 25% of them) were women. In the Post-Becker mostly-Mincer period 1972-1980, corresponding to workshop participation years 1970 to 1978, 19 students participated in the Workshop and obtained a PhD. For that period the percent female stood at 68% (13 women). In the meantime, the overall proportion of PhDs to women in the department as a whole increased somewhat: from 14.6% to 18.5%. This suggests that Columbia's Labor Workshop may have resulted in a small increase in the number of women continuing on for PhDs, but that it increasingly drew the female PhD students away from the other available workshops.

At Chicago, Becker's Applications Workshop didn't begin producing PhD's until 1972.²⁵ Cols. (3) and (4) show that during the period, 1972-80, the proportion female among PhDs who participated in Becker's workshop (14%) was double that among all PhDs graduating from the department (7%). This is by contrast to 18.5% female among all PhD graduates from the Columbia department. Thus, the proportion female among all graduates was 2.6 times higher at Columbia than at Chicago.

In order to gauge how important a Becker-founded workshop was in comparison to the rest of the workshops in a department, Panel B in Table 3 shows the percentage of all graduates who participated in one, by period and gender. From the mid-sixties to 1978 the Labor Workshop at Columbia was considerably more popular with students in the department (with 16% participating), but especially with the women students, than in the early to mid-1960s. The rise in the Workshop's popularity coincided with Mincer becoming co-director. The Workshop's popularity remained constant into the period 1970 to 1978, corresponding to graduation years 1972-80, when Mincer was its

Johnson (Lans) also attended the workshop regularly during this period starting in 1962, but did not graduate until 1967. Given our definitions she is not included among the participants in this period.

²⁵ The first to graduate was James P. Smith (in 1972).

principal director. At the same time, its popularity with women increased (from 27% to 59%), while its popularity with men declined (from 14% to 6%). For the entire period at Columbia 32% of female students, but only 8% of male students, participated in the Labor Workshop, implying that the workshop was four times as popular among women as among men.

At Chicago, in the years 1972-80, 37.5% of the 16 female graduates, but only 17% of the 213 male graduates had participated in Becker's Applications Workshop, implying a female to male popularity ratio that exceeds 2.

Comparing Chicago with Columbia over the period 1972-80 when Becker ran the Workshop he had founded at Chicago and Mincer mostly ran the Becker-founded Workshop at Columbia, a substantially higher proportion of male students participated at Chicago (17% vs. 6%), whereas the opposite holds for women (37.5% vs. 59%).

4. Data Analysis

Methods

We estimate regressions on the probability that a PhD is awarded to a woman. Our main explanatory variables of interest are indicators of participation in a Becker-founded Workshop run by Becker and/or Mincer, either at Columbia or Chicago.

We use four alternative measures of participation in such a workshop:

- (i) One dummy for participation in any workshop founded by Becker at Columbia or Chicago.
- (ii) Two dummies for participation in a Becker-founded workshop at Columbia or at Chicago.
- (iii) Four dummies: one for participation in a Becker-founded workshop at Chicago and three for participation in a Becker-founded workshop at Columbia during the distinct periods defined above: Becker-only, Becker and Mincer, and mostly-Mincer.

- (iv) One dummy for participation in any Becker-*present* workshop either at Columbia or Chicago. This dummy equals 1 in the case of the Chicago workshop and two Columbia workshop periods: Becker-only and Becker and Mincer.

The models we present include year fixed effects. Results without year fixed effects are very similar and available upon request. We present logit regressions and linear regressions. To overcome problems due to the availability of a limited number of observations we use robust standard errors. It is difficult to infer causality from our results given that individuals may have self-selected into the workshop and into the university where they are observed.

Results

Table 4 presents results for logit regressions on the odds that a PhD is obtained by a woman as a function of participation in a Becker-founded workshop two years earlier. The sample consists of 830 students who graduated with a PhD at Columbia or Chicago in the years 1960 to 1980. These are the only two universities that had a workshop founded by Becker for all or part of the period preceding graduation. Means for most of the variables included in the regressions for Columbia and Chicago taken together, total and by gender, are shown in Appendix Table A1. The significance of the differences in the means between female and male PhDs from these two universities is also shown in this table.

It can be seen from Table 4 that participation in a Becker-founded workshop is positively and significantly associated with the odds that a PhD is awarded to a woman: according to the results in col. (1), on average a student who participated in a Becker-founded workshop and obtained a PhD, either at Columbia or Chicago, had odds of being female 5.6 times those of a Columbia graduate who attended other workshops. This corresponds to the student being 20 percent more likely to be a woman according to the linear estimates (see Table 5, reporting OLS estimates).

As shown in col. (2), the odds for women are higher at Columbia than at Chicago. The odds that a woman obtained a PhD as a function of participating

in a Becker-founded workshop were twice as large at Columbia as at Chicago (an odds ratio of 7.2 vs. 3.5).

In col. (3), we consider three measures of Becker-founded workshops: one for Becker’s Chicago workshop and two for separate periods of Columbia’s Labor Workshop: the Becker and Mincer period and the mostly-Mincer period.²⁶ Had the graduate participated in the Workshop in the years 1970-1978, when Mincer was its principal director (the mostly-Mincer period), the odds of the degree recipient being a woman would be 24.7 times those of a Columbia graduate participating in other workshops. When the Workshop was directed jointly by Becker and Mincer in the years 1964-69, the odds that the graduate was a woman were almost 3 times as high as those of a Columbia graduate participating in other workshops, but the statistical significance of the “Becker and Mincer workshop” coefficient is just marginal. By contrast, participation in Chicago’s Becker workshop in 1970-78 is associated with odds that the graduate is a woman that are a statistically-significant four times higher than those of graduates who participated in Columbia’s other workshops.

In col. (4) we only include two dummies: a Becker-present Workshop dummy (including the Chicago workshop, Columbia’s Becker-only and Columbia’s Becker and Mincer workshops) and a mostly-Mincer workshop dummy. We find that the odds that a graduate is a woman are 3.3 times higher if they participated in a workshop directed by Becker (by himself or with Mincer) than if they participated in a Columbia workshop other than the Labor Workshop; the odds are 24 times higher if the graduate participated in the mostly-Mincer workshop. This implies that the odds that the graduate is a woman are 7.4 times higher in mostly-Mincer than in Becker-present workshops.²⁷ Results based on linear regressions and reported in Table 5 indicate that the likelihood that the graduate is a woman in a Becker-present

²⁶ The regression program dropped the Becker-only workshop variable due to its containing only two cases.

²⁷ The magnitude and significance of this result is clear in Table A2 where we report the odds ratio that a graduate is a woman for those who participated in the mostly-Mincer workshop at Columbia against the reference group of participants in Becker-present workshops at Columbia or Chicago.

workshop is 11 percent higher than that of a participant in other Columbia workshops, but 57 percent higher in the mostly-Mincer workshop. These findings are related to the high proportion of Columbia's female students (32%) and the relatively low proportion of Columbia's male students (8%) graduating after participating in the Labor Workshop (as shown in Table 3). All regressions controlled for year fixed effects and for whether a student graduated from Columbia or Chicago. At Chicago an Economics PhD was significantly less likely to be a woman than at Columbia. When we added graduates of Northwestern and NYU to the sample (results available upon request), we found that the odds ratio that a PhD degree is obtained by a woman is not significantly lower at Northwestern than for Columbia graduates who participated in workshops not founded by Becker.²⁸ (These results are consistent with the simple statistics presented in Table 3.)

We also estimated regressions where instead of participation in a workshop we included a dummy for whether a Becker-founded workshop was available to students two years prior to their graduation. Simple availability of a workshop founded by Becker was not as good a predictor of the likelihood that a graduate is a woman as was actual participation in the workshop as defined in the previous section.

Discussion

We are now ready to reassess the statements by Heckman and Fuchs mentioned in the introduction. When he arrived at Columbia in 1970 Heckman noted the high proportion of women at the Labor Workshop, which he estimated at about 50%. The data we report in Table 3 apply to a longer period: academic years 1970 to 1978, corresponding to graduation years 1972 to 1980, and thus extending beyond Heckman's stay at Columbia (1970-1973). They indicate that during those years 68% of those who participated in Columbia's Labor Workshop were women. Heckman's estimate for the period he was there

²⁸ It is significantly lower at NYU by about 5 percent in the model that combines the Chicago and Columbia workshops into a single measure, whereas when separating the Columbia Workshop from the Chicago Workshop, it becomes insignificant.

is consistent with the participation rate we calculate for the longer period. Had Heckman arrived a bit earlier, he would have observed a lower proportion of women at the workshop. Right before he arrived in 1970—in the years 1964 to 1969 (graduating in 1966 to 1971)—women’s participation in the Labor Workshop stood at 25%.

We don’t have the data to test Victor Fuchs’ (1994) statement that “Becker has probably helped more women earn Ph.D.s in economics than has any other Nobel Prize winner”, but we are able to support a narrower claim: *in the first twenty years of his career (years 1958 to 1978) more women earned Ph.D.s in Economics if they participated in a workshop Becker founded than if they participated in workshops directed by other professors in the two departments where he taught.* This applies both to Becker as the founder of two workshops at Columbia and Chicago and as the director of some of the workshops he founded.

Regarding Becker as a workshop founder, a student who participated in one of the workshops he founded at Columbia or Chicago, and who graduated with a PhD by 1980 was significantly more likely to be a woman than a student who participated in other workshops at Columbia. For the entire period 1960 to 1980, the odds that a woman obtained a PhD in Economics is 5.6 times higher among those who had participated in a Becker-founded workshop than among those who had participated in a different workshop at Columbia.

Regarding Becker’s role as dissertation advisor (approximated by participation in a Becker-present workshop), we find that the odds that a woman obtained a PhD in Economics at Columbia or Chicago were 3.3 times higher among those who had participated in a Becker-present workshop than among those obtaining a PhD at Columbia who had participated in another workshop. As a workshop-founder and a workshop director Becker thus helped more women earn Ph.Ds in Economics than the average for professors in the two departments where he taught in the sixties and seventies.

We have also compared Becker and Mincer as workshop directors by testing whether the odds that a graduate is a woman were significantly different

depending on whether the workshop was directed by Becker or others (mostly Mincer). We found that the odds that a graduate is a woman were significantly higher if he or she participated in the workshop directed mostly by Mincer than if they participated in a Becker-present workshop at Columbia or Chicago.²⁹ This does not contradict Fuchs' statement since Mincer is not a Nobel laureate. We don't have data to compare Becker to other Nobel-prize winning professors.

Next, we propose possible explanations for the findings regarding the odds that a graduate is a woman if students participated in a (1) Becker-founded versus another workshop and (2) Becker-present versus the mostly-Mincer workshop founded by Becker.

(1) Possible channels explaining higher presence of women in Becker-founded workshops

Topics of more interest to women? The high proportion of women in Becker-founded workshops may be related to the fact that the topics addressed in them were of relatively more interest to female graduate students in economics than to their male counterparts. For example, consider the study of women's labor supply, fertility, marriage, household production, economics of gender, and investments in children. Many dissertations at the Becker-founded workshops during this period were written on these topics, now often classified as part of household economics or of economics of the family. It has been demonstrated that women economists tend to be more interested in such topics than their male counterparts (see Dolado et al 2012, Grossbard et al 2021, Sierminska and Oaxaca 2021).

Both Becker and Mincer worked on these topics around the time that they directed workshops at Columbia and Chicago in the period under study. Mincer joined the Labor Workshop soon after he had presented his ideas on women's labor supply in a family context at an NBER conference in New York

²⁹ This is consistent with the fact that in the seventies, when Becker is at Chicago and Mincer at Columbia, at Chicago 37.5 percent of all female students participate in Becker's workshop, while at Columbia 59 percent of all female students participate in Mincer's workshop.

City in 1960 (see Mincer 1962). Mincer (1963) analyzed labor supply, fertility, and consumption. Becker also published on these topics (Becker 1960, 1965) in the early sixties. Becker and Mincer each wrote a number of articles on the value of time in home production in the early to mid-sixties, touching on the topic of fertility in particular. They continued to write on related topics in the 1970s. A case can be made that these research interests drew female students to Becker-founded workshops.

A case in point: economics of marriage and fertility. We now examine the extent to which participants in Becker-founded workshops in the years 1960-1980 wrote dissertations in an area found to be female-dominated in the economics profession around the world according to Dolado et al (2012): the economics of marriage, divorce, cohabitation and fertility. For simplicity, we call it economics of marriage and fertility. Table 6 reports dissertations on economics of marriage and fertility completed during the years 1960 to 1980 at Becker-founded workshops at Columbia and Chicago.³⁰ The table lists in order all authors of dissertations who participated in a Becker-founded workshop first for Columbia and then for Chicago dealing with marriage and fertility.

From the start of Columbia's Labor Workshop students have written theses on economics of marriage and fertility. The first student to do so was a man, Morris Silver, who participated in Becker's workshop, graduated in 1964, and wrote a dissertation on fertility. Of the nineteen women who participated in Columbia's Workshop and obtained their PhD in the period under study, six wrote dissertations on marriage or fertility: Shirley Johnson (Lans), Elizabeth F. Durbin, Marjorie Hansen (Honig), Cynthia B. Lloyd, Fredricka Pickford (Santos), and Sue Goetz Ross. In addition to Silver two other male Columbia Labor Workshop participants wrote on these topics during this period: Robert Reischauer and Mark Rosenzweig. This implies that 32% of the female participants and 12% of the male participants in Columbia's workshop wrote

³⁰ See Beller and Grossbard (2019) and Grossbard and Beller (2021) for more details on dissertations that were published by Columbia Labor Workshop participants during the period under study.

either on marriage, marital instability or fertility.³¹ (Even though we had a cutoff of 1980, all of these women and men had graduated by the mid-seventies, shortly after Becker left for Chicago).

Economics of marriage and fertility also features prominently among the topics that women participating in Becker's Chicago workshop analyzed in their dissertations. Of the six women who participated in his workshop at Chicago during the period under study, three wrote on topics related to economics of marriage and fertility: Anne Williams, Indra Mekhiya, and one of us (then Amyra Grossbard).³² Eight men who participated in the Chicago workshop also wrote theses on these themes: Alan Freiden, Edy Kogut, Dennis DeTray, Michael Keeley, Jacques Silber, Walter Wessels, Richard Steckel and Nigel Tomes. This implies that half the women and 22% of the men in Chicago's Applications Workshop 1970-78 wrote dissertations either on marriage or fertility. That Becker and Mincer both demonstrated their interest in the analysis of marriage and fertility may thus help explain why at both Columbia and Chicago female graduate students displayed a clear interest in these topics and possibly selected themselves into Becker-founded workshops.³³

Approach to research more appealing to women? The high proportion of women in the Becker-founded workshop at Columbia may also be related to the approach to research taken by Becker and Mincer when they ran their workshops, especially when together. They emphasized a combination of theory and empirical work. Becker taught price theory classes, both at Columbia and Chicago, while Mincer taught graduate-level statistics and Labor Economics at Columbia. According to Dolado et al. (2012) theoretical

³¹ Other topics covered in doctoral theses by participants in Columbia's Labor Workshop during this period include household production and consumption, economics of gender, human capital, traditional labor topics, and law and economics.

³² Of the other three women one wrote on women's labor supply (Michele Riboud) and two wrote dissertations related to law and politics. Later the latter two became active in health economics (Patricia Danzon) and economics of marriage (Ivy Papps).

³³ We observe that the topics of marriage and fertility were relatively more popular at Chicago than at Columbia, among both female and male workshop participants. This may have been because the earlier work of Becker while at Columbia differed somewhat from his later work while at Chicago.

economics fields tend to be practiced by higher proportions of men. It is likely that one reason the proportion female in the Labor Workshop at Columbia rose after 1963 (corresponding to graduation year 1965) is the added leadership of Mincer, a more empirically-oriented economist. In a recent email Heckman referred to Mincer as "... the empirical right hand of Becker and together they built a field..."³⁴ As historians of economic thought are reassessing the relative weight of theory and empirical work in economics in general (e.g., Backhouse and Cherrier 2017), and in labor economics in particular (e.g., Stafford 1986, Backhouse and Cherrier 2017), they may want to take a closer look at the development of Modern Labor and Household Economics at Columbia in the 1960s and the role that women played in the workshop that Becker founded there and that Becker and/or Mincer directed there.

Special chemistry? There may have been a "special chemistry" created by the collaboration of Becker and Mincer that stimulated a liveliness in the workshop. In Becker's (2006) words: "We (Mincer and Becker) accomplished an enormous amount together, and that was far more important than what we might have written together. This intellectual co-operation led to a great workshop..." In the words of Barry Chiswick, who participated in Becker's workshop in the early 1960s as a student and again as a faculty member after Mincer had become co-director: "... Becker and Mincer ...together ... complemented each other, the topics were new and exciting, there was an energy! I took it for granted that this was how workshops operated, only to realize that it was a rarity."³⁵ It is possible that this special chemistry was particularly attractive to women, and that this energy continued to attract women to Columbia's Labor Workshop after Becker left in 1969. This may help explain why the "Any Becker-founded workshop participation" dummy is more strongly associated with the probability that a graduate is a woman at Columbia than at Chicago.

³⁴ Pers. comm. to authors, by email, 11/28/21.

³⁵ Email comm. to the authors, dated May 25, 2021.

(2) *Possible channels explaining higher presence of women in mostly-Mincer workshop versus Becker-present workshops*

Mincer's more empirical emphasis. Mincer's more empirically-oriented approach to research and its possible appeal to female graduate students may also help explain the high odds that graduates were women in the mostly-Mincer workshop. However, we obtained testimonies that even though Becker left Columbia in 1969 some of the students who attended the mostly-Mincer workshop in the early seventies had become interested in the type of research that Gary Becker promoted while taking his micro-theory class (and/or attending his workshop) before he left.³⁶

Strong female presence. Another possible channel is that Mincer's Columbia workshop was frequently attended by (often female) former students working in the New York City area;³⁷ female current students may have felt more comfortable in a setting including a high proportion of women. By contrast, Becker's Chicago workshop was mostly attended by all-male faculty and mostly male current students. During the two years that one of us (Grossbard) participated in the workshop (1974 to 1976) she only recalls one former student of Becker, who was not part of the Chicago faculty, occasionally attending the workshop: Barry Chiswick who taught at the University of Illinois-Chicago. Becker invited another one of us (Beller) to attend his workshop: she attended in 1979-80 while she was teaching at University of Illinois-Urbana.

Different intellectual paths taken by Becker and Mincer in the 1970s. A third possible channel is related to the writings of Becker and Mincer in the 1970s, when they were directing workshops separately. One difference between

³⁶ For example, Anna Sachko (Gandolfi) communicated with Becker about possible dissertation topics before he left Columbia for Chicago and kept in touch with him. She said, "Mincer was my sponsor since Becker had moved to Chicago but I kept checking in with Becker and he was involved in the process."...I do think that my (later) work was affected greatly by Becker's and Mincer's work." Pers. comm. to Beller from Anna Sachko Gandolfi by email, January 14, 2021.

³⁷ Personal communications between Shoshana Grossbard, Marjorie Honig and Cordelia Reimers in the late 1990s. Reimers confirmed that she regularly attended Mincer's Labor Workshop after she graduated (personal communication from Cordelia Reimers to Grossbard by email, November 28, 2021).

Becker's and Mincer's writings in the 1970s could have had a particular impact on prospective students interested in economics of the household. Becker's writings and teachings on economics of the family in the 1970s included a justification for a gendered division of labor based on sociobiological arguments such as genetic fitness. For example, Becker (1976) includes the following justification for women's comparative advantage in household production: "The preferences taken as given by economists and vaguely attributed to "human nature" or something similar--the emphasis on self-interest, altruism toward kin, social distinction, and other enduring aspects of preferences--may be largely explained by the selection over time of traits having greater genetic fitness and survival value."³⁸ Some women, including female economists, disagreed with such biological justifications for gender roles. By contrast, Mincer did not publish articles focused on biological arguments justifying a traditional gendered division of labor. Women economists who challenged such arguments from outside Becker-founded workshops include Ferber and Birnbaum (1977).³⁹

5. Conclusions

Gary Becker founded two workshops that had an impact on the economics profession: the Labor Workshop at Columbia University and the Applications of Economics Workshop at Chicago. We have found that for the period 1960-1980 participation in any Becker-founded workshop, at Columbia or Chicago, is positively associated with women getting PhDs. More precisely,

³⁸ Becker's sole-authored book *A Treatise on the Family* was published in 1981 (Becker 1981), after the period under study in this paper, but he taught materials from the book's draft in his class on Economics of the Family at Chicago in the mid to late 1970s. It also contains segments with biological arguments for a gendered division of labor beyond what Becker had written in his earlier articles on the allocation of time, marriage and labor supply.

³⁹ As a student at Chicago in the mid-1970s, one of us (Grossbard) took Becker's class in economics of the family. She questioned Becker's biological assumptions both in the classroom and at Becker's workshop when he presented his paper on social interactions (Becker 1974). After Becker published the *Treatise on the Family* (Becker 1981) and his sociobiological justifications for a traditional gendered division of labor became more well-known, critiques of this approach by women economists became more common (see e.g., Beller, Krein, and Han, 1984; Bergmann 1995; and Woolley 1996).

the odds that a woman obtained a PhD in Economics is 5.6 times higher among those who had participated in any Becker-founded workshop versus those who had participated in another workshop at Columbia. This finding may be related to the fact that the topics addressed and the approach taken in the Becker-founded workshops were of relatively more interest to female graduate students in economics than to their male counterparts. For instance, the workshops promoted research on marriage and fertility, with women writing relatively more dissertations on these topics at both universities. This finding may also be explained by the excitement of new topics related to household decisions, human capital, and gender in the labor market being addressed in these workshops both theoretically and empirically.

We also found the odds that a graduate is a woman to be 7.4 times higher if he or she participated in the Columbia workshop when Mincer was its principal director than if they participated in any Becker-present workshop at Columbia or Chicago. Three possible explanations for this finding are (1) Mincer's empirically-oriented approach, (2) that regular attendees at Mincer's Columbia workshop included (often female) former students working in the New York City area, which encouraged current female students to attend, and (3) that in the 1970s Becker continued to write on economics of the family more than Mincer, and some of Becker's writings linked economic analyses to biological explanations of gender differences. Female economics students may have preferred a different approach.

In the period 1960-1980 Gary Becker founded workshops for graduate students in economics at Columbia University and the University of Chicago. The high proportion of women in these workshops was documented in this paper and compared to the proportion of women in other workshops at these universities. We have also shown that Columbia's Becker-founded Labor Workshop continued to flourish and included relatively high proportions of women in the 1970s, even after Becker left for Chicago and Mincer mostly ran the workshop. It is hoped that further research will place our findings in the context of developments in other departments of economics and thereby enable

scholars to establish the contributions of Becker, Mincer, and other prominent economists to the prevalence of women in economics.

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Table 1: Becker and Mincer Workshops at Columbia: Important Dates and Periods Considered in the Analysis

| Event | Academic Year event occurred | Calendar Year of student's graduation* | Period we consider |
|--------------------------------------------------------|-------------------------------------|-----------------------------------------------|------------------------------------|
| Becker starts labor workshop | 1958-59 | 1960 | 1960 to 1965: Becker-only |
| Last year Becker runs labor workshop alone | 1963-64** | 1965 | |
| Becker and Mincer start running workshop together | 1964-65 | 1966 | 1966 to 1971: Becker and Mincer |
| Becker on-leave from Columbia at Chicago | 1969-70 | 1971 | |
| First year post-Becker. Mincer on-leave from Columbia. | 1970-71*** | 1972 | 1972 to 1980: mostly-Mincer |
| First post-Becker year Mincer runs the workshop | 1971-72 | 1973 | |
| Last year of Mincer workshop in this study | 1978-79 | 1980 | |

Sources: Columbia University Course Catalogs, Columbia University Archives, AYs 1958-59 through 1978-79.

Notes: * Assumes a two-year lag between workshop participation and graduation. **AY 1963-64: Becker didn't actually run the workshop; he was on leave. ***AY 1970-71: The labor workshop was run by Becker students Barry Chiswick and William Landes.

Table 2: Proportion of PhDs in Economics Awarded to Women at Four Universities, Calendar Years at Graduation 1960-1980

| Time | All Four Universities | | | | |
|----------------------|------------------------------|---------------|----------------------|----------------|----------------|
| 1960-80 | 10.0% (1274) | | | | |
| | All New York City Area | | All Chicago Area | | |
| | 12.8% (631) | | 7.3% (643) | | |
| | Columbia U | NYU | U Chicago | Northwestern U | |
| | 15.5% (386) | 8.6% (245) | 4.7% (444) | 13.1% (199) | |
| By Sub-period | Columbia U | NYU | By Sub-period | U Chicago | Northwestern U |
| 1960-65 | 13.8% (116) | 8.3% (60) | 1960-71 | 2.3% (215) | 10.0% (100) |
| 1966-71 | 14.6% (151) | 7.5% (80) | | | |
| 1972-80 | 18.5% (119) | 9.5% (105) | 1972-80 | 7.0% (229) | 16.2% (99) |

Note: Below each percentage in parentheses is the total number of graduates at each university in the corresponding years.

Table 3: Proportion Female Among Participants in a Becker-Founded Workshop and All Graduates and Percentage of Graduates Who Participated in the Workshop, 1960-1980

| Panel A: Proportion Female Among Workshop Participants and All Economics Graduates | | | | | | | |
|-------------------------------------------------------------------------------------------------|----------------------------------------|-----------------------------------|--------------------|----------------------------------------|-----------------------------------|------------------|--------------------|
| Columbia U | | | | U Chicago | | | |
| t | Participated in WS ^a (1) | All Graduates ^b (2) | t | Participated in WS ^a (3) | All Graduates ^b (4) | | |
| 1960-80 | 42.2% (45) | 15.5% (386) | 1960-80 | 14.3% (42) | 4.7% (444) | | |
| 1960-65 | 0.0% (2) | 13.8% (116) | 1960-71 | No workshop | 2.3% (215) | | |
| 1966-71 | 25.0% (24) | 14.6% (151) | 1972-80 | 14.3% (42) | 7.0% (229) | | |
| 1972-80 | 68.4% (19) | 18.5% (119) | | | | | |
| Panel B: Percentage of Graduates who Participated in a Becker-Founded Workshop by Gender | | | | | | | |
| Columbia U | | | | U Chicago | | | |
| t | All ^b | Men ^c | Women ^d | t | All ^b | Men ^c | Women ^d |
| 1960-80 | 11.7% (386) | 8.0% (326) | 31.7% (60) | 1960-80 | 9.5% (444) | 8.5% (423) | 28.6% (21) |
| 1960-65 | 1.7% (116) | 2.0% (100) | 0.0% (16) | 1960-71 | n.a (215) | n.a (210) | n.a (5) |
| 1966-71 | 15.9% (151) | 14.0% (129) | 27.3% (22) | 1972-80 | 18.3% (229) | 16.9% (213) | 37.5% (16) |
| 1972-80 | 16.0% (119) | 6.2% (97) | 59.1% (22) | | | | |

Notes: ^a Below each percentage in parentheses is the total number of workshop (WS) participants that graduates at each university in the corresponding years. ^b Below each percentage in parentheses is the total number of graduates at each university in the corresponding years. ^c Below each percentage in parentheses is the total number of male graduates at each university in the corresponding years. ^d Below each percentage in parentheses is the total number of female graduates at each university in the corresponding years.

Table 4: Odds Ratio of Ph.D. Degree Obtained by a Woman at Columbia or Chicago, By Participation in a Becker-Founded Workshop with Two-Year Lag, Graduation Years 1960-1980

| VARIABLES | (1) | (2) | (3) | (4) ^b |
|-----------------------------------------------|-----------------------|-----------------------|-------------------------|-------------------------|
| Any Becker-Founded Workshop (WS) ^a | 5.5684*** (1.6810) | | | |
| Becker Chicago WS (72-80) | | 3.5133** (1.9310) | 4.0678** (2.3243) | |
| Any Columbia WS (60-80) | | 7.1586*** (2.7584) | | |
| Becker-only Columbia WS (60-65) | | | - | |
| Becker and Mincer Columbia WS (66-71) | | | 2.8280* (1.5782) | |
| Mostly-Mincer Columbia WS (72-80) | | | 24.7339*** (16.8261) | 24.4358*** (16.5780) |
| Any Becker-Present WS | | | | 3.3025*** (1.2600) |
| U Chicago | 0.2335*** (0.0669) | 0.2744*** (0.0874) | 0.2874*** (0.0907) | 0.3030*** (0.0855) |
| Constant | 0.1439*** (0.0899) | 0.1407*** (0.0875) | 0.1398*** (0.0867) | 0.1386*** (0.0859) |
| Observations | 830 | 830 | 828 | 830 |
| Pseudo R-squared | 0.1493 | 0.1514 | 0.1654 | 0.1650 |

Notes: Logit odds ratio reported. Robust standard errors are in parentheses. All equations include year fixed effects. *** p<0.01, ** p<0.05, * p<0.1. ^a WS stands for Workshop. ^b We tested the odd ratio of Mincer Columbia WS against Any Becker-Present WS by performing the same regression model as (4) but having the omitted category Any Becker-Present WS. The estimated odd ratio, 7.3992, is statistically significant at 1%, with a (5.5788) standard error.

Table 5: Linear Probability of Ph.D. Degree Obtained by a Woman at Columbia or Chicago, By Participation in a Becker-Founded Workshop with Two-Year Lag, Graduation Years 1960-1980

| VARIABLES | (1) | (2) | (3) | (4) |
|-----------------------------------------------|------------------------|------------------------|------------------------|------------------------|
| Any Becker-Founded Workshop (WS) ^a | 0.2040*** (0.0484) | | | |
| Becker Chicago WS (72-80) | | 0.0861 (0.0567) | 0.0990* (0.0566) | |
| Any Columbia WS (60-80) | | 0.3134*** (0.0753) | | |
| Becker-only Columbia WS (60-65) | | | -0.0575** (0.0267) | |
| Becker and Mincer Columbia WS (66-71) | | | 0.1382 (0.0922) | |
| Mostly-Mincer Columbia WS (72-80) | | | 0.5729*** (0.1080) | 0.5727*** (0.1079) |
| Any Becker-Present WS | | | | 0.1082** (0.0475) |
| U Chicago | -0.1049*** (0.0204) | -0.0829*** (0.0200) | -0.0797*** (0.0199) | -0.0815*** (0.0198) |
| Constant | 0.1298** (0.0534) | 0.1223** (0.0532) | 0.1212** (0.0532) | 0.1218** (0.0531) |
| Observations | 830 | 830 | 830 | 830 |
| R-squared | 0.0996 | 0.1126 | 0.1413 | 0.1402 |

Notes: Linear probability estimated by OLS method. Robust standard errors are in parentheses. All equations include year fixed effects. *** p<0.01, ** p<0.05, * p<0.1. ^a WS stands for Workshop.

Table 6: Doctoral Theses in Demographic Economics. Becker’s Workshop Columbia 1960-80 and Chicago 1972-80

| Name of student | Grad. yr | Topic(s) | Gender male=1 | Becker not principal advisor = 1 |
|-----------------------------|----------|-----------------------|---------------|----------------------------------|
| COLUMBIA STUDENTS | | | | |
| Silver, Morris | 64 | Birth rates | 1 | 0 |
| Johnson, Shirley B. | 67 | Marriage | 0 | 0 |
| Durbin, Elizabeth F. | 71 | Marital Instability | 0 | 1 (Mincer) |
| Honig, Marjorie Hansen | 71 | Marital Instability | 0 | 1 (Mincer) |
| Reischauer, Robert | 71 | Marital Instability | 1 | 0 |
| Santos, Fredericka Pickford | 72 | Marital Status | 0 | 1 (Mincer) |
| Lloyd, Cynthia B. | 72 | Fertility | 0 | 1 (Mincer) |
| Rosenzweig, Mark | 73 | Fertility | 1 | 1 (Mincer) |
| Ross, Sue Goetz | 74 | Fertility | 0 | 1 (Mincer) |
| | | | | |
| CHICAGO STUDENTS | | | | |
| Freiden, Alan | 72 | Marriage, fertility | 1 | 0 |
| Kogut, Edy | 72 | Marriage Cohabitation | 1 | 0 |
| DeTray, Dennis N | 72 | Fertility | 1 | 0 |
| Keeley, Michael | 74 | Marriage | 1 | 0 |
| Silber, Jacques | 75 | Fertility | 1 | 1 (Nerlove) |
| Wessels, Walter | 76 | Marriage | 1 | 0 |
| Williams, Anne | 76 | Fertility | 0 | 1 (Nerlove) |
| Makhija, Indra | 77 | Fertility | 0 | 0 |
| Steckel, Richard | 77 | Fertility | 1 | 1 (Fogel) |
| Grossbard, Shoshana | 78 | Marriage | 0 | 0 |
| Tomes, Nigel | 78 | Fertility | 1 | 0 |

Sources: for Columbia, Table 1 in Beller and Grossbard (2019); for Chicago, our database.

Appendix

Table A1: Descriptive Statistics on PhD's in Economics at Columbia and Chicago, Total and by Gender, 1960-1980

| VARIABLES | Total (1) | By Gender | | Diff (F-M) ^a (4) |
|-----------------------------------------------|--------------------|--------------------|--------------------|--------------------------------|
| | | Female (2) | Male (3) | |
| Gender | 0.0976 (0.2969) | 1 ... | 0 ... | |
| Columbia U | 0.4651 (0.4991) | 0.7407 (0.4410) | 0.4352 (0.4961) | 0.305*** (0.0520) |
| U Chicago | 0.5349 (0.4991) | 0.2593 (0.4410) | 0.5648 (0.4961) | -0.305*** (0.0520) |
| Any Becker-Founded Workshop (WS) ^b | 0.1048 (0.3070) | 0.3086 (0.4650) | 0.0828 (0.2760) | 0.226*** (0.0520) |
| Becker Chicago WS (72-80) | 0.0506 (0.2193) | 0.0741 (0.2635) | 0.0481 (0.2140) | 0.026 (0.0300) |
| Any Columbia WS (60-80) | 0.0542 (0.2266) | 0.2346 (0.4264) | 0.0347 (0.1832) | 0.200*** (0.0480) |
| Becker-only Columbia WS (60-65) | 0.0024 (0.0491) | 0 ... | 0.0027 (0.0516) | -0.003 (0.0020) |
| Becker-Mincer WS Columbia U (66-71) | 0.0289 (0.1677) | 0.0741 (0.2635) | 0.024 (0.1533) | 0.050* (0.0300) |
| Mostly-Mincer WS Columbia U (72-80) | 0.0229 (0.1496) | 0.1605 (0.3694) | 0.008 (0.0892) | 0.152*** (0.0410) |
| Any Becker-Present WS | 0.0819 (0.2744) | 0.1481 (0.3575) | 0.0748 (0.2632) | 0.073* (0.0410) |
| Observations | 830 | 81 | 749 | |

Notes: ^a Robust standard errors are in parentheses. ^b WS stands for Workshop. *** p<0.01, ** p<0.05, * p<0.1.

Col. (1) contains the means of the independent variables for Columbia University and the University of Chicago taken together used in the regressions presented in Table 4 on the probability a PhD degree is obtained by a woman, 1960-1980. Col. (2) contains the means among female PhDs and col. (3), the means among male PhDs. Col. (4) contains the significance of the gender differences between males and females. For example, while 11 percent of all PhD graduates from Columbia and Chicago combined during this period had participated in a Becker-founded workshop, 31 percent of female graduates but only 8 percent of male graduates had done so. This gender difference of 23 percentage points is significant at the 1% level.

Table A2: Odds Ratio of Ph.D. Degree Obtained by a Woman at Columbia or Chicago, by Participation in Mostly-Mincer's Workshop, Graduation Years 1960-1980

| VARIABLES | (1) |
|------------------------------------------------|-----------------------|
| Mostly-Mincer Columbia WS ^a (72-80) | 7.3992*** (5.5788) |
| No Becker-Founded WS | 0.3028*** (0.1155) |
| U Chicago | 0.3030*** (0.0855) |
| Constant | 0.4578 (0.3326) |
| Observations | 830 |
| Pseudo R-squared | 0.1650 |

Notes: Logit odds ratio reported. Robust standard errors are in parentheses. All equations include year fixed effects. *** p<0.01, ** p<0.05, * p<0.1. ^a WS stands for Workshop. The omitted category is participation in a Becker-present workshop at Columbia or Chicago. At Columbia this includes the Becker-only and the Becker and Mincer workshops.