University of Warsaw
Faculty of Economic Sciences

Working Papers
No. 43/2015 (191)

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GENDER, BEAUTY AND SUPPORT NETWORKS IN ACADEMIA: EVIDENCE FROM A FIELD EXPERIMENT

Warsaw 2015

University of Warsaw
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Gender, beauty and support networks in academia: evidence from a field experiment

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Abstract

Bibliometric studies show that male academics are more productive than their female counterparts and that the gap cannot be explained in terms of difference in abilities. In this project we wish to verify the hypothesis that this tendency is related to the greater support that men receive from their colleagues ("old boys network"). Towards this end we had e-mails sent by a male or female student asking academics for a minor favour. In Study 1 we asked authors of nearly 300 papers in experimental economics to share the raw data used in their study. We observed no difference in response rate or compliance rate between male and female senders. In Study 2 we sent 2775 e-mails to academics affiliated with prestigious schools from ten different fields , asking to either send us a copy of their recent article or meet the sender supposedly interested in pursuing a PhD program. Once again we manipulated gender of the senders but this time we also varied their physical attractiveness. We found a small but significant difference in the Article Treatment: attractive females' requests were honoured less often. No such tendency was found in the Meeting Treatment and no general gender effect was observed. Overall, we find very little support for the claim that early-stage male researchers enjoy greater support than their female colleagues.

Keywords:
gender, beauty, women in academia, field experiment

JEL:
J16, C93

Acknowledgements:
Authors would like to thank Marta Sylwestrzak and Konrad Siwiński for their help in conducting the experiment and Peter Szewczyk for English editing. *This project was funded from Norway Grants in the Polish-Norwegian Research Programme operated by the National Centre for Research and Development.*

Introduction

Bibliometric studies consistently show that male academics are more productive than female ones and the gap cannot be explained in terms of difference in abilities (Cole and Zuckerman 1984*;* Long 1992; Xie and Shauman 1998; Nakhaie 2002; Leahey, 2006, Penas and Willett 2006; Symonds et al. 2006; Taylor et al. 2006; Ledin et al. 2007; Abramo et al. 2009*;* van Arensberg et al. 2012). Part of the gap could be due to scientists' own choices: women start their scientific carriers at a later age (Karamessini 2004), they also spend more time raising children (Prozesky 2008). However, Prpic (2002) argues that the puzzle may be best understood in terms of others' preferences and decisions. The gap would thus mostly be associated with women's position in academia and attitudes toward them in science.

In this context, the role of social support networks cannot be undermined. Admittedly, professional relationships, both mentoring (Chandler, 1996) and those related to cooperation, are crucial for developing scientific carrier, especially for young scientists. There is evidence that being a member of a social network is connected with receiving more job offers on the labor market (McDonald, 2011) and higher scientific productivity (Reagans and Zuckerman, 2001).

But social networks also deepen inequalities. As female researchers have systematically smaller and weaker social networks within academia (Ding et al. 2006, Monroe et al. 2008), male researchers can play into the gender-science stereotype (Nosek et al., 2009) or simply show in-group favouritism, and may systematically refuse to work with or provide assistance to female colleagues. In fact, while male scientists recall mostly positive experience with receiving help from other colleagues, females report failures in collaboration and more often than men refer to professional relationships having impacted their carriers negatively (Gersick et al., 2000).

In a recent audit study (Milkman et al., 2011) more than 6500 tenure-track professors from top U.S. universities were asked by potential doctoral students to meet and talk about opportunities for research collaboration. Requestors differed only by gender and ethnicity, which were signaled by their names. Requests from female students were more often ignored than from males and gender bias was larger in the case of higher-paying disciplines.

Traces of gender bias in academia have also been identified in other types of professional situations. To name a few, gender differences were found in recruitment and selection procedure for professorial appointments (van der Brink et al. 2006; van der Brink et al. 2009), grant application selection (Wenneras and Wold 1997; Brouns 2000; Bornmann et al. 2007) and awarding prizes process (Lincoln et al. 2012). In view of gender disparities in many fields of science, rare females' positive experience from collaboration can significantly impede progress of female academics' professional careers.

In this project, we used a field experiment built upon Milkman et al. (2011)'s study design to investigate potential differences in willingness to aid a (would-be) researcher, depending on their gender. Importantly, to the best of our knowledge we are the first to also study the role of physical attractiveness in this respect.

To reach our research goals we sent hundreds of e-mail requests for relatively minor favours. Specifically, in Study 1 we asked authors of published academic papers to share the data collected in their experiments. As explored widely in the literature, scholarly data sharing has substantial benefits for the specific requestor and the profession as a whole, yet the plea is often rejected. One of the frequently invoked reasons for non-compliance is the concern about requestors' qualifications (Fienberg and Martin 1985, p. 133). To the extent that some researchers believe females to be less competent, they may shy away from sharing data with them, fearing they would come back with numerous questions or make flawed analysis publicly available.[1] Such concerns may be especially strong with respect to requestors with little research experience, e.g. students.

Study 1 was thus very closely related to (Krawczyk and Reuben, 2012). That field experiment involved sending e-mails to 200 economists who in their papers had promised to share additional research materials "upon request". Krawczyk and Reuben observed slight differences between willingness to respond to the e-mail and deliver on the promise, depending whether the requestor identified himself as faculty member or not and on the prestige of the institution with which (s)he was affiliated (Columbia, NY vs. Warsaw, Poland). Importantly, gender dimension was not investigated in that experiment.

In our Study 2 we addressed a much larger group of academics. We posed as students willing to either obtain full text of one of receiver's publication or make an appointment to talk about possibly pursuing a PhD project. Just as in Study 1, these are very minor tokens of willingness to help out someone starting their academic career. This time, on top of the gender dimension, we also manipulated physical attractiveness. Just like gender, this is an innate characteristic unlikely to be a strong predictor of performance. Yet, previous literature found that attractive individuals are more successful in labor markets (Hamermesh and Biddle 1993; Averett and Korenman 1996; Harper, 2000) and perhaps already in college (Cipriani and Zago 2011). Experiments can link these differences with unequal treatment by (potential) superiors. For instance, using the technique of correspondence testing Rooth (2009) found that obese job applicants had lower call-back rates. Lopez Bóo, et al. (2013) and Ruffle and Shtudiner (2014) recently used the same method and concluded that attractive pictures improved employability (although in the latter study the effect was only observed for men). Laboratory experiments confirmed that physically attractive participants obtain higher wage offers (Mobius and Rosenblat 2006) and ultimatum negotiation offers (Solnick and Schweitzer 1999), induce higher contributions to a public good (Andreoni and Petrie 2008), and are considered more trustworthy and trusting (Wilson and Eckel 2006). However, very little is known on how physical attractiveness can affect networking in the academia.

Our study shows that gender of the requestor does not affect probability of receiving help from more experienced scholars. However, when the requestor is a women, attractiveness can play some role. In Study 1, in which we did not consider attractiveness dimension, we do not find any

[1] Campbell et al. (2000) found no significant difference in the fraction of male and female medical researchers being denied data at least once within the last three years. However, we do not know whether the number of requests they have sent were comparable.

gender differences in the response rates or probabilities of receiving the data. In Study 2, we observe a bias against attractive female requestors – they received the requested paper significantly less often. Interestingly, the effect disappeared when we asked for an appointment. Physical attractiveness did not play any role in the case of male requestors.

Study 1

Design For the purpose of Study 1 we selected 247 experimental economics papers whose data would be useful for an unrelated project (work in progress). We have included all the papers from years 2009 to 2012 in journals: Experimental Economics (volumes 12-15), Games and Economic Behavior (volumes 65-76), Journal of Economic Psychology (volumes 30-33), Journal of Economic Behavior & Organization (volumes 69-83) satisfying some technical criteria determined by that other project. For each of them we collected information about the corresponding author. In the case of researchers being corresponding authors of more than one paper in our sample, we sent a single e-mail mentioning all the relevant papers. Exactly 205 distinct corresponding authors were identified.

Three fourth of authors in the sample were male. Half of the sample works came from universities in Europe, with only 8 percent coming from universities outside of Europe and North America.

We sent requests for raw data to the authors of the papers included in the sample. Each author was assigned to one of two treatments, corresponding to the identity of the requestor: female or male student. The e-mails were sent by University of Warsaw masters students - Marta or Konrad, respectively. Treatment assignment was random, subject to keeping the distribution of authors' gender and employment location (Europe, North America, Asia and other) identical across treatments. Authors who failed to respond within two weeks were sent a reminder.

Results

We use two natural outcome measures: the proportion of authors who replied to the e-mail (response rate) and the proportion of those who sent the material we have asked for (compliance rate), the latter being lower by construction.

Table 1. Probability of receiving answer or data in Study 1 does not depend on gender of the sender

	Female Student	Male Student
No. of requests	100	105
Response rate	75%	74.3%
MWW test (p-value)	0.907	
Marginal effects*	-0.01 (insignificant)	
Compliance rate	34%	35.2%
MWW test (p-value)	0.853	
Marginal effects*	-0.02 (insignificant)	

Notes: *Marginal effects from probit regression; specification includes subjects' characteristics (gender and university region) and fixed effects of journal, date of sending the request and number of datasets we asked for.

It turns out that in the case of sharing data, gender of the sender does not play any role: both response rate or compliance rate were independent from this dimension (see Table 1). In particular, therefore we reject the hypothesis that male requestors are treated more favorably.

Interactions of sender and author gender do not change the results and are insignificant by themselves. In Study 1 any treatment or interactions between dimensions proved to be significant. The only significant dimension was gender of the scholar we asked for a favor – female scholars tend to answer less frequently to such e-mails than male.

Study 2

Design Because of the nature of the request, the sample used in Study 1 was limited in size and scope (as it only included experimental economists). To check if the results were not only due to the field we chose, we extended our area of interest and modified type of request to be applicable in more fields of science.

In Study 2 almost 2800 scholars from ten fields of study: Philosophy, Computer Science and Information Systems, Psychology, Medicine, Mathematics, Physics, Chemistry, Economics, Sociology and Law were approached. In each of these fields we have identified one hundred top departments as listed by the QS World University Rankings[2]. Our sample is thus not representative of the academic world as a whole. However, we are not aware of a database aimed at covering all the world's universities. Moreover, we have noted that for less prestigious universities it was more difficult to find reliable information about their employees. Finally, it is reasonable to believe that the best universities serve as an example for the rest of the academia, which makes studying them particularly important.

For each of them we randomly chose four individuals from the faculty list as posted on the website. Departments with no website or faculty list on the website were excluded from the sample.

Due to the large number of scholars in the sample, we wanted the requests to be much simpler and less time-consuming for the requestees than in Study 1. We divided our sample into two parts. Half of the scholars (the Article Treatment) were asked to send us the full text of their specific recent paper (the title of which was also obtained from the website). Clearly, this is an every-day undemanding request, as a typical scientist has immediate access to his or her own work and is entitled to share it with peers under the legal concept of fair use.

Scholars who were not publishing in English or whose publication titles were all available on the website were excluded from the sample.

The second type of request (the Meeting Treatment) involved asking the faculty member to meet with requestor (ostensibly interested in pursuing graduate studies) during office hours or to talk on the phone or Skype. See the specific wording of all e-mails send in the study in Appendix A.

[2] The QS World University Rankings are one of the three most influential publications (alongside the Academic Ranking of World Universities and Higher Education World University Rankings) on quality of the international higher education institutions. It is based on academic peer reviews (40%), faculty-student ratio (20%), number of citations (20%), recruiter reviews (10%) and orientation on foreign students and scholars (10%).

Eventually, the sample for the Article Treatment consisted of 1287 scholars and for Meeting Treatment of 1488 faculty members.

These two different treatments were used partly to assess robustness of differences between requestors (if any) as explained below. It must also be noted that the Meeting Treatment made it more likely that the receiver pays more attention to the identity of the requestor.

Unlike in Study 1, requestors were not real individuals genuinely interested in seeing their plea satisfied. Thereby, we could systematically manipulate not only gender but also physical attractiveness in a two-by-two design. Before the experiment we picked 12 photos[3] of men and women. We asked 10 people to rate attractiveness of each one of them on a 0-5 scale. Photographs of the most and the least attractive individuals in each gender were used in the experiment proper.

Then we assigned all possible combinations of three features: gender, attractiveness and first name of the requestor to e-mail accounts from which we sent requests. Thus attractiveness and gender are orthogonal with respect to names we chose and we can avoid the effect of name preference (should it exist). Each of our requestors had additionally a website created with a single photo and short first blog post. We recorded the number of visits on each website.

Because requests were not genuine, we took special care to minimize the burden placed on the requestees. In the case of the Meeting Treatment, any appointment made was immediately cancelled.

After the experiment we conducted a debriefing (see Appendix A3) in which we describe purpose of our study and ask if it was an additional burden for the subjects. Only few of the authors responded from which most of the scholars expressed rather neutral or positive opinion about participating in our study.

The design of this study had been presented to and approved by the Ethics Committee of the Faculty of Economic Sciences, University of Warsaw.

Results

First, we checked how many people had a chance to see a picture of requestor (i.e. notice attractiveness). Through Gmail, we were able to find that 688 out of 1287 in the Article Treatment and 761 out of 1488 requestees in the Meeting Treatment were using Gmail account (Google Talk option available for this accounts), which means that for them the photo appeared next to the e-mail address.

Results of tests and regressions presented below in subsample of Gmail users were similar, but stronger than in whole sample.

[3] The photos were obtained from iStock.com, an on-line database of photos and videos for commercial use.

Second, a substantial fraction of the subjects visited the website of the sender. The number of unique visitors divided by the number of e-mails sent[4] was equal to .44. Interestingly, in both treatments and both genders attractive senders' websites were visited significantly more often than those of less attractive senders (with differences being typically close to 10 percentage points). This confirms that the requestees saw the pictures in the e-mail already and were more inclined to visit the website when the picture was attractive and/or were more likely to come back to the website containing an attractive picture (sometimes using a new IP, so that they were registered as unique users). Moreover, attractive senders' websites were also slightly more often visited by the same user (2.2 to 2.4 visits on average). Overall, these findings suggest that our attractiveness manipulation was successful.

In Study 2 we needed to adjust definitions of compliance in two treatments. Response rate as in Study 1 is understood as a number of responses divided by the number of e-mails sent. In the Article Treatment – compliance rate is equal to number of papers (or links to on-line version of the paper) we received divided by number of e-mails sent in the experiment. In the Meeting Treatment – we decided to define compliance as any sign of willingness to meet or talk with requestor. It means that both general invitation and proposition with specific date were treated as a successes.

Similarly to Study 1, we found no gender biases either in response or compliance in the Article Treatment or Meeting Treatment. Attractiveness did play some limited role. Specifically, among females in the Article Treatment, attractive senders were less often replied to or sent the requested paper than unattractive females (or either male group, but not significantly so).

Table 2. Attractive female senders received less responses and papers

	Attractive Female	Unattractive Female	Attractive Male	Unattractive Male
No. of requests	343	307	337	300
Response rate	**56.6%**	67.1%	63.2%	62.4%
MWW test p-value				
(vs. attractive female)		**0.006**	0.077	0.081
(vs. unattractive female)			0.301	0.330
(vs. attractive male)				0.973
Compliance rate	**49%**	59.9%	56.7%	54.8%
MWW test p-value				
(vs. attractive female)		**0.005**	0.045	0.204
(vs. unattractive female)			0.403	0.140
(vs. attractive male)				0.498

In the Meeting Treatment unattractive women received more answers with request approval than male senders, even though response rates were the same for all groups (see Table 3).

[4] It should be noted, however, that some traffic might have come from other sources (although the websites addresses were not made available outside of the study) and that some requestees might have visited the website more than once, using different IPs (e.g. from work and from home).

Table 3. Unattractive females have higher compliance rate in the Meeting Treatment.

	Attractive Female	Unattractive Female	Attractive Male	Unattractive Male
No. of requests	370	378	374	366
Response rate	45.7%	47.6%	43.9%	44.3%
MWW test p-value				
(vs. attractive female)		0.595	0.617	0.700
(vs. unattractive female)			0.300	0.359
(vs. attractive male)				0.910
Compliance rate	29.2%	34.4%	27%	27.6%
MWW test p-value				
(vs. attractive female)		0.127	0.508	0.632
(vs. unattractive female)			**0.028**	**0.045**
(vs. attractive male)				0.857

We provide additional regression analysis to check if differences between groups are not due to other differences in subjects' characteristics. Table 4 presents results of this analysis – controlling for observed differences between subjects we were able to confirm that attractive female senders received less responses and papers in the Article Treatment, whereas in the Meeting Treatment unattractive females had more appointment propositions.[5]

Table 4. Probit regression analysis confirmed the results

	Article Treatment (1)	Article Treatment (2)	Meeting Treatment (1)	Meeting Treatment (2)
	response	*compliance*	*response*	*compliance*
attractive female	-0.08*	-0.11***	0.02	0.02
unattractive female	0.03	0.18	0.05	0.09***
unattractive male	-0.02	-0.06	-0.005	0.001
female scholar	-0.05	-0.07**	-0.09***	-0.09***
Observations	1287	1287	1488	1488

Notes: Marginal effects from probit regressions; reference category is attractive male; regressions include subjects' characteristics (gender, university region, university ranking position, field of study), date of sending the request and year of the paper publication (in the Article Treatment); *** p<0.01, ** p<0.05, * p<0.1. Full regression results are available upon request.

Additional analysis was conducted to see if effects specific to the subject's field of study could be found. This, however, was not the case, see Appendix B.

Some additional insight could be gained by analyzing the content of the responses we have received. As many as 89 scholars refused to meet with the sender explaining that they do not take PhD students at all (or not any more). Because of random treatment assignment, one should expect that these cases are equally common for male and female senders. Interestingly, this was not so. Fifty-five out of 124 males negative e-mails sent to male senders and only 34 out of 111 negative e-mails sent to female senders contained such an explanation (MWW test p-value: 0.0304). This may suggest that subjects felt more obliged to justify the negative answer to male than female students.

[5] We also conducted regressions with interactions between subject's gender and sender type, but these were not significant.

Discussion and conclusions

Overall, we find very little support for the hypothesized gender inequality in support lent to students considering an academic career. In contrast to the idea of "boys' network" and the findings reported by Milkman et al. (2011), there was no systematic difference between response and compliance rates experienced by female vs. male senders. Importantly, this finding was quite robust in that it was observed for three different kinds of requests, different fields of study, with different statistical tests, and overall in a very large sample. We believe this is clearly good news. Of course, gender inequality in obtained support could show up later or in other types of situations. It would be difficult to experiment with random treatment assignment within an existing network.

At the same time, in view of our results, beauty might matter somewhat, at least in females. We propose that willingness to help will partly depend on judged competence (as explored before) and likeability. The second dimension might matter more for setting an appointment than for sending a paper – whether someone seems interpersonally attractive normally plays a substantial role when we are deciding if we want to meet them or not. One possible interpretation of the observed pattern is thus that attractive females were judged less competent but more likeable (Heilman and Stopeck, 1985). In the Article Treatment, where competence mattered relatively more, it put them at a disadvantage and they were responded and helped significantly less often than unattractive females. But in the Meeting Treatment, their greater likability made it nearly an even game again: the difference was smaller and not significant. Of course, this is just one possible interpretation, so more research is needed.

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Appendix A. Contents of e-mails and debriefing

A1.1. Typical e-mail from Study 1:

Dear Professor [Last Name inserted here],

I am a master student at the University of Warsaw. Currently we are conducting a survey on the impact of session timing on subject behavior in laboratory studies. Therefore I would very much appreciate if you were so kind to send me the raw data you have used for your paper[s:] "[Article title]".

That would be very helpful indeed.

Best regards,

[Marta Dyrkacz/Konrad Siwiński]

A1.2. Reminder from Study 1

Dear Professor [Last Name inserted here],

Some three weeks ago I asked if you would be so kind to send me the raw data you have used for your paper[s:] "[Article title]".

I would need individual (subject-level) data with indication of date and time of each experimental session. Or at least session ordering if dates are unavailable. Would you be able to send it?

The goal of our survey is to find out if subjects' behavior systematically changes over the course of an experimental project (because different people self-select for early sessions or because subjects communicate etc.).

That would be very helpful indeed.

Best regards,

[Marta Dyrkacz/Konrad Siwiński]

A2.1. Typical e-mail from Study 2 the Article Treatment:

Dear Professor [Last Name inserted here],

I have seen the abstract of your paper "[Article title]" and I think it could be useful for my project. Unfortunately, I don't seem to have access to the full text. Would you be so kind to send it to me?

It would be very helpful indeed.

Best regards,

[Requestor Name

Requestor website address]

A2.2. Typical e-mail from Study 2 the Meeting Treatment:

Dear Professor [Last Name inserted here],

I am writing you because I'm considering graduate studies and I'm really interested in your work. I was wondering if you could find a few minutes to talk to me during your office hours. Alternatively, could I perhaps call you on phone/Skype?

Best regards,

[Requestor Name

Requestor website address]

A3.3 Debrefing e-mail:

Dear Professor [Last Name inserted here],

On [MONTH] you received a request for the full text of one of your papers/ a meeting or a phone call) from [ACCOUNT]. In fact, you were a participant in an experiment on gender bias in responding to such requests. This experiment was a part of the project "Gender Equality at the University", funded by EEA&Norway Grants.

Our goal was to find whether academics are more or less likely to comply with such a request depending on whether it comes from a male or female student. Despite the fact that the number of female students and scholars has increased dramatically during the last few decades, women still experience barriers in reaching for top positions or scientific grants. We believe that those obstacles that show up at an early stage of scientific carrier might be particularly important. Young (female) researchers, without support from more experienced scientists, may easily be discouraged.

The experiment was conducted using the methodology called correspondence testing. We created several fake e-mail accounts, from which we sent requests for full texts of academic articles/ for a meeting or a telephone conversation. As we wanted to observe natural behavior of our study participants, they could not know that they were taking part in an experiment.

Be assured that the results will be presented only in aggregated form. Participants' names will remain confidential.

Thank you for participation in our study. Please accept our apologies for any inconvenience involved. We have developed a very short survey to help us better understand our participants' experience. Please answer the following questions by responding to this e-mail or via a web-based questionnaire (LINK):

1. Approximately how much time in total (if any at all) did you spend reading our request and responding to it?/ Did scheduling of the appointment we have asked for interfere with your other plans or obligations?

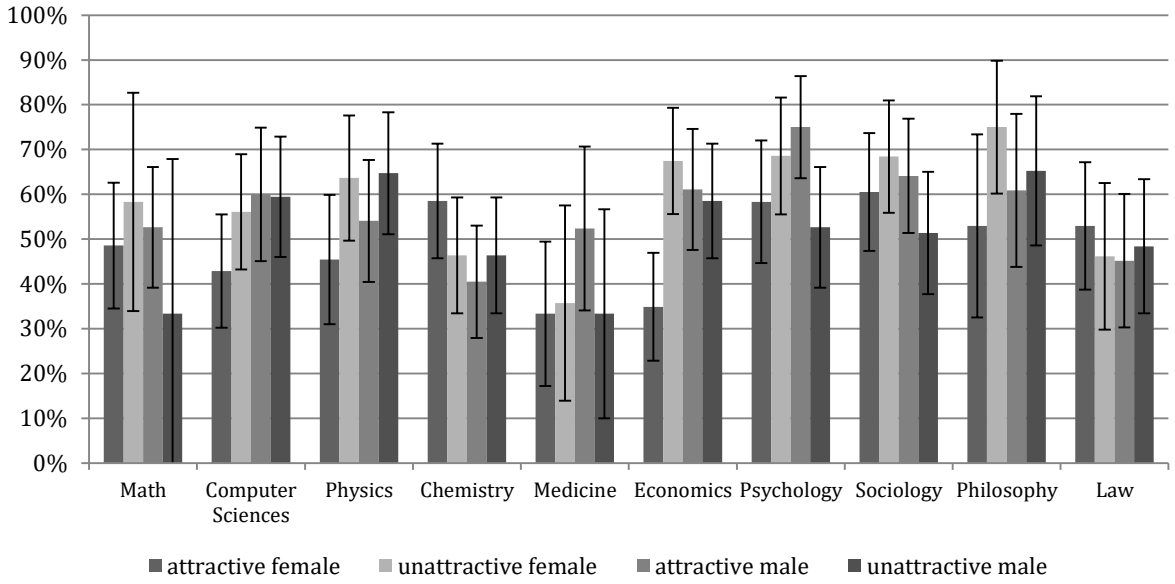
2. Do you personally feel duped or insulted because of the procedure used in our study?

3. Would you like to share any other comments on the study?

4. Would you like to share any thoughts about gender discrimination in the academia?

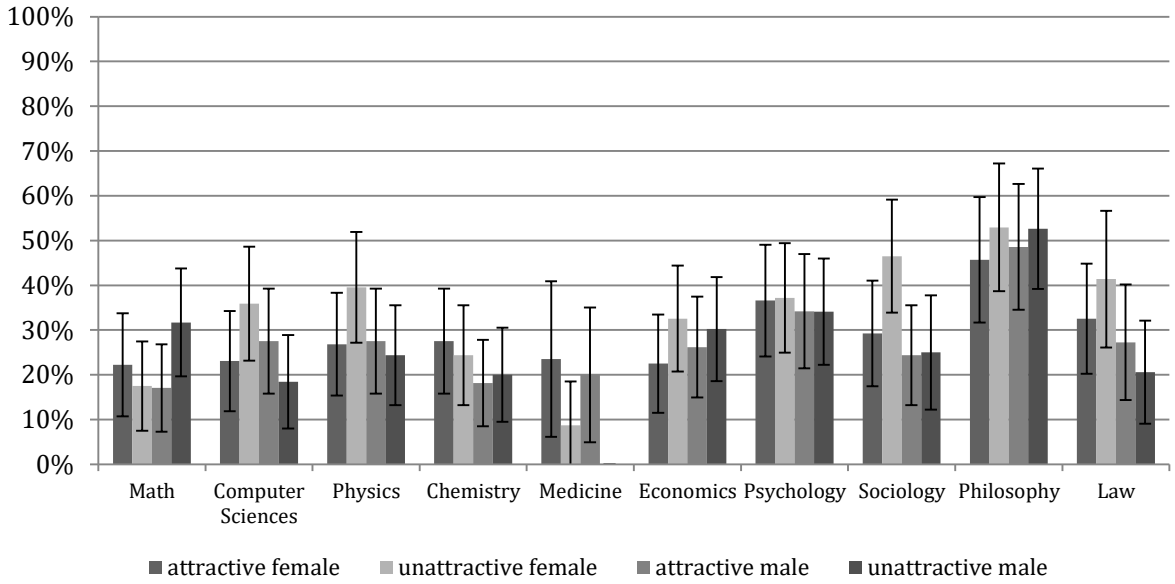
Appendix B. Experimental results by fields

Figure A1. Receiving paper frequency by field and treatment.



Note: Confidence intervals at 10%

Figure A2. Meeting consent frequency by field and treatment.



Note: Confidence intervals at 10%

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