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Fitting Into Academia: Perceived Similarity Mediates Gender Differences in Interest in Post-Graduate Academic Career

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Abstract

This study examined perceived similarity to researchers as a mediator of gender differences in interest in post-graduate academic career. Previous research has shown that male participants are more interested in post-graduate school than female participants. Research has also shown that perceived similarity to students in different academic fields was the best mediator of interest in graduating within that field. The current study examined perceived similarity to researchers on several similarity characteristics including a more specific personality aspect consisting of self-image and researcher-image in relation to interest in post-graduate academic career. Further self-efficacy was also examined as a possible mediator of gender differences in interest in post-graduate academic career. As expected, male participants showed more interest in a post-graduate academic career than female participants and perceived similarity to researchers mediated women's lower interest in post-graduate academic career. Self-efficacy was not supported as a mediator in the current study. The results are discussed in relation to previous research.

Keywords: Perceived similarity, gender, academia, fit

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There is an old saying that birds of a feather flock together. People like to be around people they are similar to and people who are similar often share the same interests. But what about when you do not fit in? Perceived dissimilarity to an occupational group might have negative influence on your interest in a career within that occupation. The current study aims to investigate if perceived similarity to researchers can explain why women are less interested in a post-graduate academic career than men.

Previous research has shown that perceived similarity to students in two different academic fields, one male-dominated (computer science) and one female-dominated (English), was the best mediator of interest, among several social mediators, in women's lower interest in majoring within that field (Cheryan & Plaut, 2010). Previous research has also shown that students perceive the researcher stereotype to be more related to the perception of the male than the female stereotype (Nosek et al., 2009; Sinclair, Tellhed & Björklund, 2013) and that men are more interested, especially more interested when they learn that the academic field is male-dominated, in post-graduate school than women (Tellhed, 2013).

In this study I examined perceived similarity to researchers as a possible explanation of women's lower interest in a post-graduate academic career. One question left unanswered in the study by Cheryan and Plaut (2010) was which kind of perceived similarity matters for gender differences in interest in choice of academic majors. In the current study I investigated several different possible perceived similarity aspects in relation to interest in a post-graduate academic career. This study also investigated a more detailed similarity aspect consisting of several personality characteristics. The hypothesis was that perceived similarity to researchers would mediate interest in post-graduate academic career. Further, self-efficacy was examined on three levels of abstraction as a possible mediator of gender differences in interest in post-graduate academic career.

Why Post-Graduate Academic Career?

The academia is gender imbalanced in Sweden. Although there are 62 % female undergraduates across all university degrees, the male students make out a greater proportion of the post-graduate students (SOU 2011:1). Among professors 82 % are currently male and men are twice more likely than women to become professors (HSV, 2008:20). Although there are more female lectures within the social sciences than the natural sciences, there is a gender imbalance in the social sciences and a more equal proportion of female professors within the social sciences cannot be expected before year 2030(SOU 2011:1).

Recent research has shown that male students within the social sciences expressed more interest in post-graduate school than female students and that this interest increased among the male students when they read information regarding the academia being male-dominated (Tellhed, 2013). Why men showed more interest in post-graduate school when learning that the academia is male-dominated is however not known. One possible explanation is that the male students experienced more similarity to researchers than women and therefore a higher fit to the occupation researcher.

Given that the academia is gender imbalanced it is of interest to examine why women are less interested in a post-graduate academic career and this is the focus of the current study. Previous research has shown the importance of different social factors when explaining sex differences in occupational interests (Su, Rounds & Armstrong, 2009). There is a large body of research explaining gender differences in interests from different theoretical perspectives and showing the importance of several social factors. For example, research has shown that perceived similarity to students within academic fields was the best mediator of interest in pursuing a major within the field (Cheryan & Plaut, 2010). In another study, Diekman, Brown, Johnston and Clark (2010) showed the importance of goals when pursuing a career within a field. Other studies have shown the importance of self-efficacy beliefs in relation to occupational preferences and the importance of self-efficacy in explaining interest or disinterest within a career (Betz & Hackett, 1981; Hackett & Betz, 1981). The current study examines these mediators of interest to explain why women are underrepresented within the academia.

General Perceived Similarity and Interests

Perceptions of similarity to people in the field are important in individuals' developing an interest in that field (Cheryan & Plaut, 2010). Cheryan and Plaut investigated students' interest in computer science and English by asking how interested students were in majoring in either of these disciplines and asking students how similar they were to students within these disciplines. Results showed that men reported more interest in computer science and more similarity to students within that field. Women on the other hand reported more interest in English and more similarity to English majors. Perceived similarity mediated interest in computer science even after controlling for social identity threats and expectations of success. Cheryan and Plaut concluded that women are less interested in computer science since they feel dissimilar to people within the field and propose that perceived similarity to people in the field can be an important factor in explaining underrepresentation in various

academic fields. The framework person-environment fit is of interest when discussing the results of Cheryan and Plaut's study.

Person-environment fit. Within organizational psychology the attraction-selection-attrition (ASA) framework (Schneider, 1987) and the concept of fit has been used to explain differences in interest in various occupational careers. According to the ASA framework, people are attracted to organizations on the basis of perceived and actual fit between personal and organizational characteristics (Schneider, Goldstein & Smith, 1995). Of primary concern are the collective characteristics of people in the organization, which Schneider refers to as personality, attitudes and values of important people within the organization and which over time determine who are attracted to the organization. People who believe there is a similarity or fit between themselves and the organization and people within the organization are attracted to the organization and choose to stay within the organization.

The concept of person-environment fit is defined as the degree of congruence between a person and the persons' environment (Sekiguchi, 2004). A fit between the individual and the environment is generally considered to have good outcomes for the individual and the environment (Ostroff & Schulte, 2012). The environment that the individual has a fit to can be on different hierarchical levels within the organizational environment. For example the fit between the individual and the environment can be operationalized as a fit to another person, for example a supervisor, a fit to the work group or can be a fit to the whole organization (Ostroff & Schulte, 2012).

Fit between the person and environment assumes that some characteristics of the person are viewed in combination with some characteristics of the environment (Ostroff & Schulte, 2012). To measure the individual's characteristics (the person side of person-environment fit) several different factors depending on the research focus have been of consideration. Ostroff and Schulte mention that various variables of interest have been personality variables such as traits, individual interests, goals and values but also variables such as knowledge, abilities and skills. There is also variation on how the environment side of the person-environment fit has been measured. According to Ostroff and Schulte sometimes environment is measured as an aggregated personality across individuals in the organization one is comparing the individual to. A similarity measure of this kind could be similarity to others in personality characteristics but environment can also be measured as rules and socio-cultural values. According to Schneider (1987), environment should be measured based on the collective characteristics or personal attributes of the people in the environment because it is these individuals who make the place. People like to be around other people who are similar

to them and distance themselves from people who they believe are dissimilar. The ASA framework posits that people will be attracted to and remain in environments where other people have similar interests, values and personalities as themselves. Fit to the environment based on the characteristics of people who inhabit it is referred to as person-person fit (Van Vianen, 2000). Person-person fit can be combined with any of the hierarchical levels of fit that was mentioned earlier. For example the personality characteristics of an individual can be compared to the personality characteristics of the supervisor or on a group level these personality characteristics can be compared to those of the coworkers.

The fit between the person to environment has been conceptualized on several different dimensions (Sekiguchi, 2004). A supplementary fit occurs when the person possess similar characteristics to other individuals within an environment which leads to that the person believe they are fitting into the environment because they are similar to the people around them. A complementary fit is when a person's characteristics add to something that is missing in the environment. Another dimension of person-environment fit is perceived versus actual fit. Perceived fit exists when the person believes that there is a similarity between themselves and the environment and is typically measured by asking people to what degree they believe that a similarity or fit exists. Actual fit, on the other hand, is measured by comparing the characteristics of interest on two different levels. An example of actual fit is comparing personality characteristics of the individual with personality characteristics of the supervisor.

In relation to fit theory, the results from Cheryan and Plaut (2010), which showed that perceived similarity was the best mediator of interest in an academic field, can be explained in terms of fit. Students that perceived themselves as similar to other students within an academic field were more interested in majoring within that field because they fit in with the people in the field.

The present study used a perceived similarity with a person-person environment paradigm and well-established theories from social psychology to understand and explain the results of the study. Since Cheryan and Plaut (2010) asked students "how similar are you to a computer science/English major?" it is not possible to conclude from the study which kind of similarity aspects participants had in mind when given their answers. Different similarity aspects can be of importance in different educations and occupations and which aspects a researcher chooses will depend on the theoretical framework of the study in question. It is possible that general perceived similarity could be considered an overarching term to other similarity aspects but that is also not possible to conclude from the study by Cheryan and

Plaut since no other similarity aspects were used in the study. The current study aimed to get a more differentiated insight in which aspects of similarity are important for interest in post-graduate academic career. General perceived similarity was kept as an aspect of similarity in the current study and can be considered comparable to the measurement used by Cheryan and Plaut.

Similarity in Personality and Interests

There is a large body of research that has shown sex differences in vocational interests (Su et al., 2009). Holland (1966) argued that vocational interests are the expression of personality in work. One way to understand these sex differences in interest is through social role theory. According to social role theory men and women are different because society has taught them to behave differently and develop different interests depending on their gender (Eagly & Karu, 2002). Gender stereotypes suggest that men and women will have different personality characteristics. Social role theory describes men as having higher agency traits and women as having higher communion traits. Traditionally agentic traits are those associated with men and indicate achievement striving, task orientation and assertiveness. Communal traits on the other hand are traditionally associated with women and indicate a desire to foster relations, sensitivity and helpfulness (Eagly & Steffen, 1986). According to social role theory, personality characteristics that are commonly associated with males and females have become normative. This suggests that gender stereotypes have become the norm on how men and women are expected to behave. According to Prentice & Carranza (2002) gender stereotypes describe how men and women are, which influences how people view themselves and others, but in addition gender stereotypes also describe how men and women should be. If an occupation is associated with agentic traits then men would be more likely than women to seek employment within that occupation.

Personality and occupations. The choice of an occupation is largely based on one's perception of the field and the people working in the field (Diekmann & Eagly, 2000). According to Diekmann and Eagly, occupational stereotypes that are based on gender will influence a self-selection into traditional gender-typed occupations. Further these occupational stereotypes get integrated with individuals' own ability to see oneself within the occupation. Occupations that are dominated by either men or women perpetuate gender-typing and individuals who do not belong to the dominant gender are less likely to pursue a career in the occupation (Glick, Wilk, & Perreault, 1995).

Cejka and Eagly (1999) examined if success within a male or female dominated occupation was related to personality characteristics considered typical of either males or

females. Cejka and Eagly argue that female-dominated occupations are thought to require personality characteristics that are stereotypically feminine whereas male-dominated occupations require personality characteristics, which are stereotypically considered masculine. Cejka and Eagly showed that in female dominated occupations, participants considered female traits a requirement to be successful and in male dominated occupations, male traits were considered a requirement for success. Traits that were considered congruent with feminine personality were for example helpful to others, sociable and on a cognitive dimension for example verbally skilled and artistic. Traits that were considered congruent with masculine personality were for example competitive and dominant and on a cognitive dimension analytical and good at problem solving. This research showed that gender-typed occupations are not only considered largely male or female respectively, but female and male traits have also been integrated into a view of the occupation which further might filter out any person not belonging to the dominated gender within that occupation.

According to McLean and Kalin (1994) people pursue careers that are perceived as congruent with one's self-image and avoid careers that are perceived as incongruent with one's self-image. McLean and Kalin showed that perceived similarity between occupational stereotypes in six different occupations and one's own self-image was greater for occupations one intended to pursue. Given that people tend to prefer occupations, that are congruent with their self-image as McLean and Kalin's research showed and that gender-roles become internalized in self-concepts (Cross & Madson, 1997) and that male and female dominated occupations are considered to require male or female personality characteristics (Cejka & Eagly, 1999) it is likely that men and women will show interest in gender-stereotypic occupations as they believe there is a congruence between the occupation and themselves.

Gender differences in agency have narrowed over time but gender differences in communion have remained relatively stable (Diekmann & Eagly, 2000). Men in particular show lack of fit between their personality and communal traits whereas women report both communal and agentic traits (Twenge, 1997). Lack of fit between men's personality and communal traits can be a contributing factor to men's choice of gender-stereotypical occupations.

DiDonato & Strough (2013) investigated college students' gender-typed beliefs about occupations as a predictor regarding their own academic major and intended professional future career and also investigated attitudes regarding which gender-typed occupations was considered appropriate for men and women. Results showed that college students preferred gender-stereotypical occupations for themselves and that women's preferences predicted their

decisions for their academic major. Students reported that men should pursue only male-dominated occupations but women should pursue both male and female-dominated occupations. This is in line with previous research that shows that women's self-concept are becoming more incorporated with agentic traits (Twenge, 1997).

Stereotypical view of scientists/researchers. According to Wyer, Schneider, Nassar-McMillan and Oliver-Hoyo (2010) the image of the scientist/researcher influences views on who can be a scientist/researcher and who is best suited for the occupation. Wyer et al. investigated students' images of scientists using the Stereotypes of Scientists scale which measures characteristics on both a professional and interpersonal competencies dimensions. Results showed that students' perceptions of scientists were to some degree in alignment with norms of masculinity but also incorporated traits such as family oriented and cooperative and Wyer et al. interpreted the results in terms of students having a complex and contradictory image of scientists.

In another study, Sinclair et al. (2013) investigated whether the general held stereotype of researchers were related to the male or female stereotype. The results showed that students rated the masculinity items as more descriptive of the typical researcher than the femininity items. This means that the general stereotype of the researcher was considered more male than female. In a follow up study, participants were asked to rate adjectives on the typical researcher, typical man and typical woman. Analysis showed that there was a larger difference in the ratings of between researcher and woman than there was between researcher and man. The results were interpreted as that the researcher stereotype is more male-typed than female-typed.

If the general view of the researcher is that of a man, it is quite possible that the stereotype acts as a filter for women who, by the description "a scientist/researcher is a man", do not fit in. This is consistent with Heilman's lack of fit model (2001) that posits that if a workplace role is inconsistent with the characteristics that are associated with a person then that person will suffer from perceived lack of fit to the workplace role. According to the model when individuals believe there is a lack of fit this leads to expectations of lack of success and failure in the workplace role. According to this theory gender stereotypes will affect the perception of an individual's characteristics and workplace roles and if these characteristics are not congruent with a person's gender then there will be a lack of fit to the workplace role.

Another study showed that across 34 countries the implicit attitudes of scientists were associated with men to a larger extent than women (Nosek et al., 2009). Since people tend to

have dissimilar beliefs about how scientists and women are and similar beliefs about scientist and men, as showed by the research from Nosek et al., this can affect students contemplating a post-graduate academic career.

One possible explanation to the sex differences in interest in post-graduate school that was found in Tellhed's (2013) research is that men feel more similar to researchers in personality than women. If women perceive themselves as different to researchers in personality this could lead less interest in a post-graduate career whereas if men perceive themselves as more similar to researchers in personality this could lead to more interest in post-graduate academic career.

Similarity in Goals and Interests

Diekman et al. (2010) argue that social roles are critical in understanding why people pursue a career and that gender roles in society will influence the goals people have. Traditionally women have had caretaking roles that are associated with communion-oriented goals. In a meta-analysis of the field Su et al. (2009) showed that women prefer working with people whereas men are more interested in working with things. According to Hogan and Blake (1999) vocational interests are a reflection of a person's identity and are best investigated in terms of people's motives, goals and values.

One way of understanding women's underrepresentation in science, technology, engineering and mathematics (STEM) is by looking at men's and women's goals and which career interests these goals are perceived as congruent with (Diekman, Clark, Johnston, Brown & Steinberg, 2011). Diekman et al. propose that communal goals are especially important to women and if women believe that a career will not fulfill these communal goals then women will be less interested in pursuing a career within that field. Communal goals are for example working with others and helping others whereas agentic goals are power and achievement. Further Diekman et al. propose that people hold stereotypic beliefs about which activities will facilitate or impede these communal goals. According to Diekman et al. gender differences in educational or vocational interests are primarily due to communal (focus on others) rather than agentic goals (focus on self) and careers within STEM are not considered congruent with communal goals. These goals and peoples beliefs about which careers will facilitate or impede the fulfillment of the goals form attitudes on which careers to pursue.

In one study Diekman et al. (2010) examined interest in STEM fields and relation to communal goals. Analysis showed that STEM careers were considered incongruent with communal goals and participants with interest in fulfilling communal goals showed less interest in pursuing a career within the STEM fields. The research also showed that interest in

fulfilling agentic goals facilitated interest in STEM careers and also careers considered male-stereotypic and that interest in fulfilling communal goals facilitated interest in female-stereotypic careers.

In another study Diekman et al. (2011) investigated experimentally the impact of goals and interest in STEM careers. Diekman et al activated communal goals by asking participants to write a story about when they have wanted to care for someone else. Subsequently, participants reported their interest in STEM, non-STEM, male-stereotypic and female-stereotypic careers. Participants who had communal goals activated showed less interest in STEM careers.

One possible explanation to the sex differences in interest in post-graduate school that was found in Tellhed's (2013) research is that men and women have different occupational goals. Given that the academic field is male-dominated (HSV, 2008:20) and that communal goals are more important to women (Diekman et al., 2010; Diekman et al., 2011) it is possible that women are less interested in a post-graduate career since they perceive themselves to have dissimilar occupational goals to researchers.

Similarity in Competence and Interest

Hackett and Betz (1981) identified self-efficacy as an important factor in explaining women's interest or disinterest in a particular academic field or career. Self-efficacy refers to people's beliefs in their ability to perform a behavior or an action (Bandura, 1977). Betz and Hackett (1981) showed that self-efficacy beliefs were related to occupational preferences in activities that were considered either gender appropriate or gender inappropriate. Betz and Hackett argue that social messages that women are not as good as men in for example science together with less encouragement to develop talents within sciences may lead to lower self-efficacy in science which leads to lower interest in a science related academic and occupational field.

Betz and Hackett (1981) argue that women in underrepresented fields are at a psychological disadvantage with regards to confidence. Women who drop out of STEM fields report lower self-efficacy than women who do not drop out and women who persist within the fields generally report lower self-efficacy than men (Brainard & Carlin, 1998). Litzler and Young (2012) examined students' attrition from undergraduate engineering fields and found that interest and self-confidence were related to dropping out of engineering majors.

Expectancy-value model. According to expectancy-value model, individuals choose a career depending on how valuable they believe this career to be and how well they expect they will do in this career (Wigfield & Eccles, 2000). The model posits that performance on

tasks, academic and occupational achievement can be explained by how well individuals believe they can do on the task and also how much they value the task. These expectancies on how well one will do on a task are theorized to be influenced by ability beliefs. Ability beliefs are a closely related concept to self-efficacy and these ability beliefs are affected by individuals' goals. According to expectancy-value theory these expectations of success is influenced by gender stereotypes. Wigfield and Eccles argue that the socialization of gender stereotypical roles is likely to lead men and women to attach different value to various goals that will lead to different choices depending on the how high priority is placed on the specific goals.

Measuring self-efficacy. According to Hackett (1995) individuals' perception of competence can be measured on several different levels of abstraction. For example Betz and Hackett (1981) investigated career self-efficacy among undergraduate students. Participants were asked to indicate how successfully they believed they could complete educational requirements and job tasks of 10 traditionally female stereotypic and 10 traditionally male stereotypic occupations. Participants also indicated how interested they were in pursuing a career within the occupations. Results showed that there were sex differences in career self-efficacy. Men reported equivalent career self-efficacy with regards to both traditionally female and male occupations. Women reported significantly higher levels of career self-efficacy in regards to female stereotypic occupations and significantly lower levels of career self-efficacy with regards to male stereotypic occupations. Self-efficacy was shown to be related to the degree of interest participants reported in pursuing a career. In this study, self-efficacy was measured by asking participants if they believed they could successfully complete educational and occupational requirements. It is also possible to measure self-efficacy on a task-specific level.

A task-specific measurement of self-efficacy in the occupation researcher/ scientist would be a measurement of research self-efficacy. Overall, Deane and Peterson (2011) investigated doctoral students' research self-efficacy by asking the doctoral students to assess how confident they were on a variety of research tasks, for example how confident they were in choosing an appropriate research design and showed that research self-efficacy was related to academic support and autonomy. According to Hackett (1995) people make career choices based on stereotypic information about the career and people might not have specific work tasks in mind when making career choices. However if people have some knowledge on what tasks are associated with a career this might still be a valuable measure as people are not likely to choose a career if they believe that the tasks are incompatible with their competence.

It is also possible to measure self-efficacy on ability level as proposed by expectancy-value model (1999) and ability is defined as the person's perception of current competence on an activity. Although ability beliefs are closely related to self-efficacy, ability beliefs are concerned with the current competence on a given activity and self-efficacy on expectations of success. Ability beliefs in mathematics have been investigated in relation to selection of science-based majors among college students (Betz & Hackett, 1983) but can be measured on a variety of academic and non-academic fields (Wigfield, Tonks & Klauda, 2009).

Although beliefs in one's competence can be measured in various ways, when people believe they are competent in a field they are more likely to be pervasive and succeed within that field. In Cheryan and Plaut's (2010) study, expectations of success (e.g. self-efficacy) were a significant mediator of gender differences in interest in choice of academic majors however the strongest mediator was perceived similarity. In the current study, self-efficacy is assessed on three different levels along with perceived similarity mediators.

Value Similarity and Interest

There is a lot of research within organizational psychology which claims that similarity in values between organizations and employees are of importance to job satisfaction (Ostroff & Judge, 2012). When individuals identify with their organization's values, they are more satisfied with their job and are more likely to stay within the organization (Kristof-Brown, Zimmerman & Johnson, 2005). If individuals who have the same values as the organization are more likely to stay within the organization, as the literature suggests, then it is likely to assume that the people within the organization will have similar values as each other.

Edwards and Cable (2009) investigated why positive outcomes might result when there is a match between employees and organizations values. Edwards and Cable used various values such as altruism, security and relationships and asked participants to rate how important these values were to them and also asked participants to rate how important these values were to the organization. The results showed that value similarity was important but only for trust and communication. These results indicate that value similarity can be explained by the trust and communication a person place in the organization and its members.

If value similarity promotes trust and communication among employees and the organization and increases likelihood of people agreeing and sharing the same goals then it is likely to result in positive outcomes. According to Austin (2002) the socialization to an academic career begins at graduate school, or earlier, with students assuming the values and attitudes of those within the faculty they want to join. Learning the values, attitudes and

expectations of the academic group and how students own values and interest fit those who are already belong to the academia are important in deciding on whether one wishes to pursue a career within the academia or not. Given that value similarity to an organization is of importance for individuals' decision on whether to stay in an organization or not (Edwards & Cable, 2009) it is possible that similarity in values between students and the typical researcher is of importance to students' interest in a post-graduate academic career. It is however also possible that value similarity becomes more important once a person has joined an organization. The literature suggests that values although somewhat stable are susceptible to change to a variety of influences from a new environment. People's values become more congruent with an organization over time and judgments of fit towards on occupation are more likely to be made on personality traits than values since values are less observable (Ryan & Kristof-Brown, 2003).

Other Similarity Aspects and Interest

Several different similarity aspects might be of importance when people consider a career. According to Eccles (1987) people assess a match between their self-image and the image of the occupations they are considering. A comparison is made between the image of oneself to the image one has of an occupation. The image of the occupation can be stereotypical and according Eccles women may rule out occupations that they feel does not fit well with their self-image.

Self-to-prototype matching theory. According to Hannover and Kessel's self-to-prototype matching theory (2004), people construct an image of the typical person who works in a profession and subsequently compare the image they have of this typical person to their self-image and make choices depending on the closest fit to self-image. The characteristics of the prototype can be completely irrelevant characteristics to working within that profession. Hannover and Kessel's research suggested that high school students disinterest in mathematics and science were due to prototypes of the typical student within these disciplines were highly dissimilar from the self-image that the students had.

In the current study I investigated the possibility of similarity in hobbies and physical appearance as mediators of interest in a post-graduate academic career. Both of these similarity aspects are seemingly irrelevant characteristics in relation to an academic career. It is quite possible to work with people who have dissimilar hobbies to oneself, although hobbies might influence interest in an occupational career. Similarity in physical appearance on the other hand ought to be completely irrelevant to interest in a career, however research has shown that perceived similarity on various traits including physical attractiveness was

important for students' academic choices (Kessels & Taconis, 2012). Given these theoretical suggestions, that irrelevant characteristics can be of importance to occupational interest, both hobbies and physical appearance was added to the investigated variables in the current study.

Overview of the Current Study

Previous work on gender differences in academic interest has shown that perceived similarity to students within the field was the best mediator of women's lower interest in computer science and men's lower interest in English (Cheryan & Plaut, 2010). Within organizational fit theory, a large body of research has shown that when characteristics of people and the work environment fit together there are positive outcomes (Ostroff & Judge, 2012). Even though there are more female than male undergraduate students, male students make out a greater proportion of the post-graduate students and although there are more female lectures within the social sciences than within the natural sciences, the gender imbalance within the social sciences of female professors are not expected to be on a more equal level to men until year 2030 (HSV, 2008:20). Recent research has shown that students perceive the researcher stereotype to be more related to the perception of the male than the female stereotype (Nosek et al., 2009; Sinclair et al., 2013) and that male students are more interested in post-graduate school than female students (Tellhed, 2013). Tellhed's research showed that male students rated significant higher degrees of interest in post-graduate school when they learned that the academia is male-dominated. Why male students showed higher degrees of interest in post-graduate school when learning that the academia is male-dominated is not known. One possible explanation is that the male students perceived higher levels of similarity to the people within the academic field. In the current study I used the same manipulation as Tellhed in hopes of recreating the effect of male students showing higher levels of interest in an academic career when learning that the field is gender imbalanced.

One question left unanswered by Cheryan and Plaut's (2010) study on perceived similarity was which kind of similarity matters for interest in an academic field. Within fit theory, several different similarity aspects have been shown to be of importance when people choose a career. Ostroff and Schulte's (2012) review of the field mentions similarity aspects such as traits, goals, values, attitudes, skills and abilities but in theory there could be many more similarity aspects that could be of importance. Given that gender differences in interest is bound to be a complex issue with multiple levels of explanations, similarity aspects were tested explorative while testing for the strongest mediator of gender differences in interest.

In the current study I investigate students' perceived similarity to researchers and the relation to interest in post-graduate academic career. To my knowledge this is the first study

that investigates perceived similarity as a mediator of gender differences in interest in post-graduate career. The hypotheses are as follows:

- Hypothesis 1 a & b: Male participants will express more interest than female participants in a post-graduate academic career, consistently across conditions (male dominance, towards equity and neutral information/control group) (Hypothesis 1 a) and male participants will report the highest levels of interest in post-graduate academic career when they receive information that the academia is gender imbalanced (Hypothesis 1 b).
- Hypothesis 2: Perceived similarity mediates gender differences in interest in post-graduate academic career.
- Hypothesis 3: Self-efficacy mediates gender differences in interest in post-graduate academic career.

Method

Participants

190 students (100 women and 90 men) from various undergraduate and graduate classes within the Social Sciences department at Lund University participated in this study. Educational credits varied among the participants, 0-60 credits ($n=76$), 61-90 credits ($n=15$), 91-180 ($n=52$) and above 181 ($n=47$). 163 of the participants indicated that they did not have a university degree and 27 stated that they had a university degree. A variety of departments within the Social Sciences were represented within the sample. The mean age of the sample was 23.88 ($SD=4.2$).

Material

Manipulation.

Experimental manipulation. The second page of the questionnaire contained the manipulation. The experimental manipulation was the same as the one used by Tellhed (2013). Information given in both experimental conditions was true but focused on different aspects of the academic gender imbalance.

Gender imbalance information was given in two different ways. Participants in the experimental condition “male dominance” read information about how the academia is mainly male dominated. Example of information given in this condition is “About 80% of the professors in Sweden are men, even though women have been in majority of the university students since 1970”. Reading information about that the academia is gender imbalanced was hypothesized to increase men’s interest in post-graduate academic career as it did in Tellhed’s

(2013) study. Participants in the experimental condition “towards equity” also read information about how the academia is male dominated but becoming more equal. Example of information in this condition is “The last ten years female lecturers have increased by about 20%”. The information in the condition “towards equity” also primes gender imbalance but from another perspective as it is specified that the academia is gender imbalanced but becoming more equal. Participants in the control condition were given information that the study was to investigate students’ interest in an academic future.

Manipulation check. To investigate if the manipulation worked as intended, a measure of association between researcher and gender was used as a manipulation check. Participants were asked to indicate whether the word “researcher” mainly makes them think of a woman or man on a 7-point Likert scale. This measurement is the same as used by Tellhed (2013). If manipulation works as intended then participants receiving information that the academia is male-dominated should associate researchers more with men than participants not receiving any information about the imbalance in academia.

Interest in post-graduate career. Interest in a post graduate school was measured by asking students, “How interested are you in applying for post graduate studies?”, which is the same measure as previously used by Tellhed (2013). Interest in working as a researcher was measured by asking students, “How interested are you in working as a researcher in the future?”, this measure was adapted from Cheryan and Plaut (2010). Both questions were answered on a scale ranging from 1 (*not at all interested*) to 7 (*very interested*). To measure how much participants would enjoy doing research, students were asked, “How much would you enjoy doing research?” which is a measure adapted from Eccles & Wigfield (2002). This question was answered on a scale ranging from 1 (*not at all enjoyable*) to 7 (*very enjoyable*). Adding these items together created a measurement of total interest in post-graduate academic career. In the current study the Cronbach alpha for this measurement was $\alpha .92$.

Perceived Similarity. To measure participants’ perceived similarity to people in the field (e.g. researcher/scientists) a measurement was adapted from Cheryan and Plaut (2010). Cheryan and Plaut asked participants how similar they were to a computer science or English major. In the current study participants were asked to rate on a scale ranging from 1 (*not at all*) to 7 (*very much*) how similar they believe they were to a researcher in general. In addition to this measure, which resembles the measure used by Cheryan and Plaut, a more specific similarity measure was constructed. This similarity measure asked participants to rate how similar to a researcher they thought they were on these characteristics: personality, occupational goals, values, competence, hobbies and physical appearance. The reason for

expanding the measure was to investigate what aspects of similarity are captured by Cheryan and Plaut's similarity measure.

Fit between researcher-image and self-image. Fit between researcher-image and self-image is another similarity measure. This similarity measure is more specific since it measures similarity in individual characteristics, as indicated by participants' image of perceived researcher characteristics (researcher-image) and ratings of the same characteristics on oneself (self-image). Participants' perceived similarity between researcher-image and self-image was measured using the Stereotypes of Scientists (SOS) scale. The SOS scale was developed to measure individuals' perceptions of scientists (Wyer et al., 2010). The SOS has two factors measuring perceptions of scientists' professional competencies and interpersonal competencies. The scale was translated to Swedish and instructions were adapted to suit the current study.

The SOS scale contains 22 items and participants were asked to rate to which extent they agreed with the scale's statements on a seven-point Likert scale. Participants first rated to which extent they agree that the statements were true about a researcher and then rated to which extent the statements were true of themselves. Examples of items on the professional competencies factor are "logical" and "know a lot about the latest discoveries". Examples of items on the interpersonal competencies factor are "family oriented" and "cooperative". Since participants were also asked to rate to which extent they agreed that these statements corresponded with their self-image, a few items were adapted in order to be able to test the perceived similarity between participants' perceptions of researchers and perceptions of themselves. For example the statement "have unhappy marriages" was changed to "have unhappy relationships" as it was considered possible that participants might not be married and also possible that the general perception of a researcher might not be a married researcher.

Eleven items were added to measure the stereotypes of scientists together with the SOS scale. These items were taken from Sinclair et al. (2013) study of Swedish university students' perceptions of researchers. The items in Sinclair et al.'s study contain various items that had been used to in previous studies to describe the researcher stereotype and also included items from Bem's sex-role inventory (1974) to investigate if the researcher stereotype overlaps the male stereotype more than the female stereotype. Only items that had a mean value over 5, measured on a scale ranging from 1 to 7, in Sinclair et al. study were considered to be included in the current study. Items were compared to the existing items on the SOS scale to avoid duplicating or overlapping items. A total of eleven items were added

to the questionnaire. The benefits of adding these items are that they have already been tested on the population of Swedish university students and since the SOS scale has been developed and tested on American university students it is possible that there is a difference in how students in different countries perceive the typical researcher, depending on their own personal experiences and interactions with various researchers. Another benefit is that Sinclair et al. investigated the stereotype of researchers among students in social sciences faculties and Wyer et al. (2010) studied stereotype of scientists which is primarily a word describing people working in the natural sciences. It is quite possible that the view of a researcher/scientist will be different among natural sciences and social sciences and because of that, adding items from a study that used the same population as the one that this study targets is a benefit. Examples of items included are ambitious, devoted to work, intellectual, curious and persistent. In the current study the Cronbach alpha for the dimensions, professional competencies and interpersonal competencies were $\alpha .82$ and $\alpha .70$ respectively.

The 33 items describing researcher-image and self-image were randomized to create one order for the questionnaire and ABBA counterbalancing technique was used, so that half of the participants got a reversed order of the words. This was done in order to remove possible linear effects.

To suit the current study, the instructions used in the study by Wyer et al. (2010) were changed from “When I think about a scientist, I think they:” to “Please rate how well the following statements fit with your general perception of a researcher”. The instructions when rating the statements on self-image was “Please rate how well the following statements fit with how you perceive yourself”. The reason for this change was to be able to use the same items to ask participants to rate how well these statements responded to participants’ own perception of themselves as well as their perceptions of researcher. Since one purpose of the current study was to investigate perceived similarity between participants’ perception of researchers and themselves, it was important that the items were worded so that participants could indicate to which degree these items responded to both themselves and researchers.

Self-efficacy. According to Hackett (1995) it is possible to measure self-efficacy on several different levels of abstraction. In the present study a test-battery of three different self-efficacy levels of abstraction was used. The levels assessed were career self-efficacy, ability beliefs and task-specific self-efficacy where task-specific self-efficacy is the most concrete level.

Career self-efficacy. To assess self-efficacy expectations with regard to a career in higher education, two measures were constructed based on Betz and Hackett’s (1981)

measurement of career-related self-efficacy. Betz and Hackett's measurement of self-efficacy in various occupations required participants to answer yes or no to the question of whether participants believed they could successfully complete the required education for a particular occupation. Maurer and Pierce (1998) showed that using a Likert scale to measure self-efficacy have similar reliability, similar factor loading across structures, similar discriminability and provide equivalent levels of prediction as using the traditional yes and no measurement of self-efficacy in academic performance. Given that similar results can be expected using a Likert scale to a traditional measurement of self-efficacy, level of self-efficacy was assessed in the current study by asking participants to rate their level of confidence in how successfully they felt they could complete the required educational training for a career as a researcher on a 7-point Likert scale.

Following Betz and Hackett's (1981) procedure, strength of self-efficacy expectations was assessed by asking participants to indicate their degree of confidence in their ability to successfully complete the job duties of a researcher. Both the level and strength of self-efficacy was measured on a 7-point Likert scales ranging from *do not agree* (1) to *completely agree* (7). In addition, participants were asked to assess how confident they were in their overall ability to complete a research project.

Task-specific self-efficacy. To assess participants' task-specific self-efficacy, items were selected from Forester, Kahn and Hesson-McInnis' (2004) research of the three most common measurements of research self-efficacy. Participants were asked to rate how confident they were in their ability to succeed in performing various research tasks. The scale ranged from *not at all confident* (1) to *completely confident* (7). Forester et al. identified four factors underlying the three most commonly used research self-efficacy scales. These four factors are research integration, data collection, data analysis and technical writing. Forester et al. suggests that to investigate students' research self-efficacy a measurement can be constructed across the four underlying factors. In the current study, 13 items were selected to measure research self-efficacy and covered all four underlying factors suggested by Forester et al. The reason for not using all items in the original scale by Forester et al. is that the scale contains 107 items and which are too many to suit the current study. Items were chosen based on factor loadings. The items were translated to Swedish and adapted to suit the current study. Examples of items included in the 13-item scale, are "Generate researchable questions" and "Interpret and understand statistical data analysis". In the current study, the Cronbach alpha coefficient for the 13-item scale was $\alpha .92$.

Ability beliefs. To measure ability beliefs, a scale with four items were constructed asking participants to rate how good they believe they were in areas of mathematics, language, technical ability and cooperation. These items were adapted from Wigfield and Eccles (2000) and measured on a 7-point Likert scale.

Gender identification. To measure gender identification Eriksson and Lindholm's (2007) translated version of the Collective Self-Esteem Scale, which consists of four items, was used. The purpose of this scale is to measure in-group identification in regards to gender. The reason for measuring gender identification was that the current study investigates gender differences and to add a measure of gender identification is beneficial in order to control that men and women did indeed identify as men and women in the study. An example of an item on the translated version of the scale is "Being a woman/man is important for my self-image" and was measured on a 7-point Likert scale ranging from *do not agree* (1) to *completely agree* (7). The translated version of the scale has an internal consistency of α .66. In the current study, the internal consistency of the scale was α .76.

Procedure

Mass testing was conducted during lecture breaks and students were informed that the questionnaire regarded interest in a future academic career. Completing the questionnaire took about ten minutes. Students were informed that they needed to fill in the questionnaire individually and not compare answers with each other. The experimental leader stayed in the classroom to make sure participants followed instructions. Informal consent was given both orally during presentation of the questionnaire and in writing on the first page of the questionnaire.

Participants were randomized into the three conditions as the questionnaire was distributed. Questionnaires had been randomized prior to distribution, using a rotating latin square. Following the experimental and control condition information, participants were asked to indicate their interest in a postgraduate career and how similar they perceived themselves to researchers on various characteristics. Participants then rated how well various words described the typical researcher and how well the same words described themselves. Subsequently, participants rated their general self-efficacy for a career in science, research self-efficacy and general ability beliefs. Participants were then asked to indicate in-group identity on gender and completed the manipulation check. The last two questions were open-ended questions about what participants thought the study was about and whether they wanted to add any additional information. All participants were debriefed in a mass debriefing and thanked for their participation with chocolate.

Results

Prior to analysis, assumption testing was conducted to with no serious violations noted. Summed up scales that consisted of several items were transformed to original scaling, ranging from 1 to 7, in order for means to be reported with clarity and easier interpretation. Before the main analyses a t-test for independent samples was conducted, indicating no significant differences ($t < 1$) between men and women in their ratings of gender identification with women scoring marginally higher ($M = 4.09$, $SD = 1.34$) than men ($M = 3.91$, $SD = 1.48$) which is in line with previous results by Eriksson and Lindholm (2007).

Manipulation Check

Prior to the main analysis, a one-way analysis of variance (ANOVA) was conducted to investigate if the manipulation had been effective. The between factor was manipulation (male dominance/ towards equity/ neutral) and the dependent variable was the manipulation check (association between researcher and gender). There was no significant main effect of the manipulation ($F < 1$). Given a non-significant manipulation check, it can be concluded that the manipulation has not worked as predicted in this study.

Differences in Interest in Post-Graduate Academic Career

A two-way between-groups analysis of variance (ANOVA) was conducted to investigate hypothesis 1 a and hypothesis 1 b. The between factors were manipulation (male dominance/ towards equity/ neutral) and gender (female/ male). The dependent variable was the total interest in a post-graduate academic career scale, which consists of the three items regarding interest.

There was an overall significant main effect of sex, [$F(1, 184) = 6.542$, $p = .011$, $\eta^2 = .03$]. Men reported more total interest in an academic post-graduate career ($M = 3.84$, $SD = 1.6$) than did women ($M = 3.23$, $SD = 1.6$), which supports the hypothesis that male participants will express more interest than female participants in a post-graduate academic career (Hypothesis 1 a).

There was no significant main effect of the manipulation on interest in post-graduate career, ($F < 1$).

The interaction effect between manipulation and gender was not statistically significant, [$F(2, 184) = 1.3$, $p > .05$], which means that the hypothesis that male participants will report the highest levels of interest in a post-graduate academic career when they receive information that the academia is gender imbalanced did not gain support in this study (Hypothesis 1 b).

Testing Meditational Similarity Hypothesis

A series of preliminary mediation analyses (Baron & Kenny, 1986) was conducted to test the hypothesis that perceived similarity mediates gender differences in interest in post-graduate academic career (Hypothesis 2). If any possible mediator did not gain support as a mediator it was eliminated and not added to the final analysis. For means, standard deviations and effect sizes on all variables reaching significant gender differences see Table 1.

Table 1

Means, standard deviations and effect sizes on all variables reaching significant gender differences

	Women	Men	η^2
	Mean (SD)	Mean (SD)	
Interest in post-graduate career	3.23 (1.63)	3.84 (1.65)	.034
General perceived similarity	3.10 (1.46)	3.64 (1.63)	.031
Perceived similarity in personality	3.18 (1.35)	4.02 (1.51)	.079
Perceived similarity in occupational goals	3.10 (1.66)	3.90 (1.72)	.054
Perceived similarity in values	3.97 (1.38)	4.57 (1.55)	.040
Perceived similarity in hobbies	2.93 (1.40)	3.58 (1.79)	.039
Technical ability belief	3.49 (1.38)	4.71 (1.37)	.201
Cooperative ability belief	5.83 (1.05)	5.34 (1.36)	.039
Researcher-image professional competencies	4.93 (.68)	4.73 (.64)	.024
Self-image professional competencies	4.16 (.69)	4.51 (.80)	.052
Self-image interpersonal competencies	5.43 (.69)	5.03 (.82)	.060

Perceived general similarity as a possible mediator. First, I tested perceived general similarity as a mediator for gender differences in interest. As seen above, women were less interested in a post-graduate career than were men, [$B = -.61$, $\beta = -.183$, $SE = .23$, $p < .05$]. Second, women perceived themselves having less general similarity to researchers than did men, [$B = -.54$, $\beta = -.174$, $SE = .22$, $p < .05$]. Third, perceived general similarity significantly

predicted how interested participants were in a post-graduate career, [$B = .75, \beta = .71, SE = .05, p < .001$]. When interest in post-graduate career was regressed on both gender and perceived general similarity, the relationship between gender and interest in a post-graduate career was eliminated, [$B = -.20, \beta = -.06, SE = .17, p > .05$]. The Sobel Test (Sobel, 1982) indicated that general similarity was a significant mediator of the relationship between gender and interest in a post-graduate career, [$Z = -2.39, p = .016$]. As predicted, the mediating relationship suggests that women are less interested in a post-graduate career because they feel dissimilar to how they perceive researchers in general.

Next I turned to testing different aspects of perceived similarity as a mediator. All possible mediators are organized under subtitles for clarity, beginning with perceived similarity in personality.

Perceived similarity in personality as a possible mediator. Women reported less perceived similarity to researchers in personality than did men, [$B = -.84, \beta = -.28, SE = .20, p < .001$]. Perceived similarity in personality significantly predicted interest in a post-graduate career, [$B = .69, \beta = .61, SE = .06, p < .001$]. When interest in post-graduate career was regressed on gender and perceived similarity in personality, the relationship between gender and interest in a post-graduate career was eliminated, [$B = -.03, \beta = -.009, SE = .19, p > .05$]. Sobel test (1982) indicated that perceived similarity in personality was a significant mediator of the relationship between gender and interest in post-graduate career, [$Z = -3.94, p < .001$]. This mediating relationship suggests that women are less interested in a post-graduate academic career because they feel dissimilar in personality to how they perceive researchers.

Perceived similarity in occupational goals as a possible mediator. When sex was regressed on perceived similarity in occupational goals, women reported less perceived similarity to researchers in occupational goals than did men, [$B = -.80, \beta = -.23, SE = .24, p < .001$]. Perceived similarity in occupational goals significantly predicted interest in a post-graduate career, [$B = .68, \beta = .71, SE = .04, p < .001$]. When interest in post-graduate career was regressed on both sex and perceived similarity in occupational goals, the relationship between sex and interest in a post-graduate career was eliminated, [$B = -.06, \beta = -.021, SE = .17, p > .05$]. The Sobel Test (1982) indicated that perceived occupational similarity was a significant mediator of the relationship between sex and interest in a post-graduate career, [$Z = -3.23, p < .001$]. This mediating relationship suggest that women are less interested in a post-graduate academic career because they perceive themselves as having dissimilar occupational goals to the people in the field.

Perceived similarity in values as a possible mediator. Women reported less perceived similarity to researchers in values than did men, [$B = -.59, \beta = -.20, SE = .21, p < .05$]. Perceived similarity in values significantly predicted interest in a post-graduate career, [$B = .71, \beta = .63, SE = .06, p < .001$]. When interest in post-graduate career was regressed on both sex and perceived similarity in values, the relationship between sex and interest in post-graduate career was no longer significant, [$B = -.19, \beta = -.058, SE = .19, p > .05$]. The Sobel Test (1982) indicated that perceived similarity in values was a significant mediator [$Z = -2.73, p = .006$] which suggests that women are less interested in a post-graduate academic career because they perceive themselves as having dissimilar values to researchers.

Perceived similarity in hobbies as a possible mediator. Regressing sex on perceived similarity in hobbies, showed that women reported less perceived similarity to researchers in hobbies than did men, [$B = -.64, \beta = -.199, SE = .23, p < .05$]. Perceived similarity in hobbies significantly predicted interest in a post-graduate career, [$B = .45, \beta = .44, SE = .06, p < .001$]. The relationship between sex and interest in post-graduate career was eliminated when sex was regressed together with perceived similarity in hobbies, [$B = -.33, \beta = -.099, SE = .22, p > .05$]. Sobel Test (1982) showed that perceived similarity in hobbies was a significant mediator [$Z = -2.60, p < .009$] which indicates that that women are less interested in a post-graduate career because they perceive themselves as dissimilar in hobbies to researchers.

Perceived similarity in competence as a possible mediator. Regressing sex on perceived similarity in competence showed no significant sex differences, [$B = -.21, \beta = -.071, SE = .21, p > .05$]. Perceived similarity in competence was therefore eliminated as a possible mediator.

Perceived similarity in physical appearance as a possible mediator. When sex was regressed on perceived similarity in physical appearance there was no significant sex differences, [$B = -.13, \beta = -.036, SE = .23, p > .05$]. Perceived similarity in physical appearance was therefore eliminated as a mediator.

Overview of Results of Similarity Mediators

The meditational analyses left five perceived similarity mediators; general, personality, occupational goals, values and hobbies. Before conducting a hierarchical regression to establish which mediators are needed in a model for explaining gender differences in interest in post-graduate academic career, I conducted a series of meditational

analyses to examine if self-efficacy mediates the relationship between gender and interest in a post-graduate academic career.

Testing Meditational Self-Efficacy Hypothesis

A series of preliminary meditational analyses were conducted to test meditational hypothesis regarding self-efficacy (Hypothesis 3). As noted above, perceived similarity in competence did not reach significance in the current study however the other aspects of self-efficacy were examined to investigate if any of the levels of abstraction of self-efficacy mediates the relationship between gender and interest in post-graduate academic career. The relationship between gender and interest has already been established and was not tested again.

Career self-efficacy as a possible mediator. There were no sex differences in career self-efficacy in regards to whether participants believed they could successfully complete the required educational training for a career as a researcher, [$B = -.007, \beta = -.002, SE = .22, p > .05$], in regards to whether participants believed they could successfully completing the job duties of a researcher, [$B = .02, \beta = .002, SE = .21, p > .05$] nor in participants confidence in their overall ability to complete a research project, [$B = -.07, \beta = -.02, SE = .20, p > .05$]. Career self-efficacy was therefore not a mediator in this study.

Task-specific self-efficacy as a possible mediator. For task-specific self-efficacy the total scale research self-efficacy was used. There was no significant sex differences in research self-efficacy, [$B = -3.9, \beta = -.14, SE = 2.0, p = .052$]. In the current study, research self-efficacy was not a mediator.

Ability beliefs as a possible mediator. Turning to the four ability beliefs, when regressing sex on the ability beliefs, there was no significant sex differences in perceived mathematics ability, [$B = -.009, \beta = -.003, SE = .24, p > .05$] nor in language ability, [$B = .13, \beta = .05, SE = .18, p > .05$]. Ability beliefs, mathematics and language ability are therefore not mediators.

However, there was a sex difference in perceived technical ability, where women reported less technical ability than did men, [$B = -1.2, \beta = -.406, SE = .20, p < .05$]. The effect size of sex differences in perceived technical ability was large (See table 1 for means, standard deviations and effect sizes). However it did not predict interest in post-graduate career, [$B = .08, \beta = .072, SE = .08, p > .05$]. It is therefore not a mediator.

Also women reported more perceived cooperative ability than did men, [$B = .48, \beta = .19, SE = .17, p < .05$]. However cooperative ability did not predict interest in post-graduate

academic career, [$B = -.009$, $\beta = -.006$, $SE = .09$, $p > .05$] and is therefore not a mediator of gender differences in interest in post-graduate academic career.

Understanding the Role of Perceived Similarity in Interest in Post-Graduate Academic Career

Hierarchical regression was used to understand the mediating role of perceived similarity in explaining gender differences in interest in a post-graduate academic career. Hierarchical regression was conducted with the five perceived similarity variables and since self-efficacy was not a mediator, none of the self-efficacy variables was added. Given that there were several mediators that are likely to overlap in explanatory power, all mediators might not be needed in an explanation model, thus hierarchical regression was used to establish which mediators were needed in a model.

The mediators were entered into the hierarchical regression in terms of theoretical importance¹. In the first step sex was entered. Subsequently, mediators were entered until sex could no longer explain differences in interest in post-graduate academic career. Two models were tested, the first model had perceived similarity in personality as the second step and the other regression model had perceived similarity in occupational goals as the second step.

After step 1, with sex entered into the regression, the model explained 3.4 % of the variance in interest in a post-graduate academic career, [$R^2 = .034$, $F(1,188) = 6.548$, $p = .011$]. After step 2, with perceived similarity in personality added into the prediction of interest in post-graduate academic career another 35% of the variance could be explained, [$R^2 = .38$, $F(2,187) = 58.100$, $p < .001$]. Gender no longer significantly predicted interest in post-graduate academic career, [$\beta = -.009$, $p > .05$] whilst perceived similarity in personality could explain the variance in interest in post-graduate academic career, [$\beta = .61$, $p < .001$]. Given that gender no longer could explain differences in interest and perceived similarity in personality could explain differences in interest, adding more mediators at this point would make them redundant as the mediation has already been explained. A second model was however also tested with perceived similarity in occupational goals entered as the second step after gender.

When entering perceived similarity in occupational goals at step 2, this mediator added 47 % of the variance explained in interest in post-graduate academic career, [$R^2 = .50$, $F(2,187) = 177.275$, $p < .001$]. Perceived similarity in occupational goals predicted interest in

¹ Of the five significant similarity mediators, perceived similarity in personality and perceived similarity in occupational goals were considered to be of higher theoretical importance due to the vast amount of literature supporting these mediators (Cejka & Eagly, 1999; Diekmann et al., 2010; Diekmann et al., 2011; Diekmann & Eagly, 2000; DiDonato & Strough, 2013; Su et al., 2009).

post graduate academic career, [$\beta = .70, p < .001$] and gender no longer significantly explained differences in interest in post-graduate academic career, [$\beta = -.021, p > .05$].

Although each of the perceived similarity factors alone mediated the relationship between gender and interest in post-graduate academic career, perceived similarity in personality could alone explain gender differences in interest in post-graduate academic career when entered as the first mediator. The second model showed that entering perceived similarity in occupational goals as the first mediator also could explain gender differences in interest in post-graduate academic career and the variance explained was larger than the first model with perceived similarity in personality. Both perceived similarity in personality and perceived similarity in occupational goals could alone explain gender differences in interest in post-graduate academic career and this might be due to inter correlations between mediators. See Table 2 for correlations between measures of interest in post-graduate academic career and all perceived similarity mediators reaching significant gender differences.

Table 2

Pearson Product-Moment correlations between measures of interest in post-graduate career and all perceived similarity mediators reaching significant gender differences

Variable	1	2	3	4	5	6
1. Interest in post-graduate career	-	.710**	.619**	.710**	.638**	.444**
2. Perceived general similarity		-	.696**	.639**	.593**	.536**
3. Perceived similarity in personality			-	.606**	.625**	.587**
4. Perceived similarity in occupational goals				-	.692**	.588**
5. Perceived similarity in values					-	.501**
6. Perceived similarity in hobbies						-

** $p < .001$ (2-tailed).

As can be seen in Table 2 general perceived similarity correlates strongly with all significant mediators which supports the notion that perceived general similarity can be considered an overarching term to the other mediators.

Fit Between Self-Image and Researcher-Image in Relation to Interest in Post-Graduate Career

In order to investigate if similarity between self-image and researcher-image, as measured by the personality characteristics on the Stereotypes of Scientists scale, will increase interest in post-graduate academic career, polynomial regression with response surface analysis was used.

Traditionally difference scores have been used in studies of organizational fit and other congruence studies (Edwards & Parry, 1993). However difference scores have been criticized due to reduced reliability, ambiguous interpretation and confounding the effects of the original variables on which the difference is based (Edwards & Parry, 1993; Edwards, 2002). According to Edwards & Parry using polynomial regression with response surface analysis provides a better alternative to using difference scores but since the coefficients from the polynomial regression is difficult to interpret it is less often used. Given the methodological problems with difference scores, polynomial regression with response surface analysis was used to investigate the hypothesis. Only the dimension professional competencies from the Stereotypes of Scientists scale was used in the analysis because the dimension interpersonal competencies did not correlate with interest in post-graduate academic career ($r = -.09$). There was however significant gender differences in self-image ratings of interpersonal competencies. For means, standard deviations and effect sizes on all variables reaching significant gender differences see Table 1.

I followed the instructions from Shanock, Baran, Gentry, Pattison and Heggstad (2010) on how to conduct the polynomial regression and how to interpret the coefficients through response surface analysis. Since polynomial regression with response surface analysis is not common, explanations for how I conducted the analysis is given.

Before conducting response surface analysis, polynomial regression is conducted (Shanock et al., 2010). The general equation to test for relationships using polynomial regression is $Z = b_0 + b_1X + b_2Y + b_3X^2 + b_4XY + b_5Y^2 + e$. This equation according to Shanock et al. allows testing both a linear regression model that tests the two predictors in relation to the outcome variable and a quadratic model through the squared difference that tests deviation from congruence between the difference variables.

Following the guidelines from Shanock et al. (2010) both the linear regression model and the quadratic model was tested. First I centered the predictors at midpoint since Shanock et al. states that this will aid in interpretation and reduce potential multicollinearity. Polynomial regression was performed on the square of the centered researcher-image

variable, the square of the centered self-image variable, the cross-product of the centered researcher-image and self-image variable, the centered researcher-image variable and the centered self-image variable and regressed on interest in post-graduate academic career. The regression model was significant, [$R^2 = .066$, $F(5,184) = 2.618$, $p = .026$] which according to Shanock et al. gives reason to conduct response surface analysis.

Response surface analysis was conducted across four surface test values. The line of congruence has two values, one for slope and one for curvature (Shanock et al., 2010). This measures how agreement between the two predictor variables relates to the outcome. Examining the coefficients on the line congruence showed that both researcher competence, [$B = .63$, $\beta = .25$, $SE = .35$, $p > .05$], and self competence, [$B = .32$, $\beta = .15$, $SE = .27$, $p > .05$], increased as the interest in post-graduate academic career increased however this increase was not significant. The curvature on the line of congruence was not significant, [$t = -1.729$, $p > .05$] which means that the relationship was linear.

The line of incongruence also has two surface values, one for slope and one for curvature (Shanock et al., 2010). This measures the degree of discrepancy by assessing possible curvature and a negative significant value would mean that the outcome variable decreases as degree of discrepancy increase. Examining the coefficients on the line of incongruence showed that researcher competence, [$B = -.25$, $\beta = -.19$, $SE = .18$, $p > .05$] and self competence, [$B = -.29$, $\beta = -.17$, $SE = .15$, $p > .05$], decreased as interest in post-graduate academic career decreased but this decrease was not significant. The slope of the line of incongruence was not significant, [$t = 0.7$, $p > .05$].

This regression model shows low explanation power of the variance in interest in post-graduate academic career. Examinations of coefficients showed that none of the predictors contributed significantly to the regression model and it is reasonable to conclude that the relationship is not strong enough to assume that there is a fit between researcher-image and self-image in relation to interest in post-graduate academic career.

Discussion

The aim of the present study was to investigate perceived similarity to researchers in relation to gender differences in interest in post-graduate academic career. It was hypothesized that men would express more interest than women in a post-graduate academic career due to the field being male dominated and that perceived similarity to researchers would mediate interest in post-graduate academic career. These hypotheses gained support in the present study. One possible explanation to women being less interested than men in post-

graduate academic career is due to women experience a lack of fit to the occupation because women perceive themselves as dissimilar to the typical researcher and the current study supported this explanation. Several possible perceived similarity aspects was investigated in relation to differences in interest in a post-graduate academic career and a more specific and detailed personality measure was used to assess fit between self-image and researcher-image in relation to interest in a post-graduate academic career. Further it was hypothesized that self-efficacy would mediate gender differences in interest in post-graduate academic career but this study has not supported that hypothesis.

Gender Differences in Interest in Post-Graduate Academic Career

As hypothesized, men reported more interest in a post-graduate academic career than women (Hypothesis 1 a). This was expected due to the academic field being male-dominant. The effect size was small. See Table 1 for means, standard deviations and effect sized on all variables reaching significant gender differences in the current study. These results are in line with Tellhed's study (2013) where men in general reported more interest in post-graduate school than women. The effect size being small is also expected as it is the same effect size as in Tellhed's study and given that the same manipulation was used and that the current study used the same population (e.g. students within the departments of Social Sciences at Lund University) as Tellhed, one cannot really expect too much of a change in ratings of interest. Also one needs to keep in mind that there are more female lecturers and researchers within the social sciences than within the natural sciences and this will affect the students as in who they come into contact with during their time at the university and also will affect who they believe can be a researcher.

The hypothesis that men would report the highest levels of interested in a post-graduate academic career when learning that the academia is gender imbalanced was not supported (Hypothesis 1 b). Given that the manipulation check was non-significant it can be concluded that the manipulation did not work as designed in the current study. In a previous study, the same experimental manipulation was used and the results indicated that men showed more interest in post-graduate school when learning that the field was male-dominated (Tellhed, 2013). I used the same experimental manipulation in hopes of recreating this effect and to investigate career interest in relation to perceived similarity to researchers. One possible explanation to that the manipulation did not work as designed is that the experimental leader (e.g. me) is female and this can have an effect on the participants. In Tellhed's study, a male experimental leader was used and using a female experimental leader might have caused a change in effect. Context has been shown to be important in previous

studies. For example, Björklund, Bäckström & Jørgensen (2011) showed that people tend to rate their in-group more positively when this rating was given to an experimental leader that was a member of the in-group than to an experimental leader that was a member of an out-group. Given that experimental leaders can have an effect on participants, it is a possibility that a female experimental leader affected the participants.

Perceived Similarity Mediates Gender Differences in Interest in Post-Graduate Academic Career

As expected, perceived similarity mediates gender differences in interest in post-graduate academic career (Hypothesis 2). Preliminary mediational analyses showed that five of the similarity variables were mediators. It should be noted that although several mediators reached significance, it would be misleading to think of these as separate significant results. The mediators are all moderately to highly correlated and cannot be considered as separate results. The hierarchical regression also showed that depending on which model was used, similarity in personality or similarity in occupational goals, could alone explain gender differences in interest in post-graduate academic career, rendering the other mediators redundant. If any of these mediators would have been used alone in the study, they would have been able to explain gender differences in interest in post-graduate academic career but the final regression model they were not needed due to overlapping in explanatory power.

Perceived general similarity. Perceived general similarity was shown to be a mediator in the initial preliminary analysis but in final regression model rendered redundant. Previous research by Cheryan and Plaut (2010) has shown that general similarity is a mediator of gender differences in interest in choice of academic subject and it is not surprising that general perceived similarity could mediate gender differences in interest in post-graduate academic career in the preliminary analysis. General perceived similarity is a vague term but was of interest in the study as it is a similar term to what Cheryan and Plaut used in their study.

As can be seen in Table 2, general perceived similarity correlates strongly with all other mediators in the current study. General perceived similarity was considered an overarching term to other similarity aspects and considering the strong correlations with the other mediators it seems possible that it can be considered an overarching concept. Given the strong correlation between general perceived similarity and similarity in personality it is possible that participants mainly have personality in mind when responding to a general similarity question as the one used in Cheryan and Plauts' study. However given that perceived general similarity also correlates strongly with the other mediators it is difficult to

know what participants actually have in mind and using more specific similarity questions should be considered preferable. Although it is possible to consider general perceived similarity an overarching concept to other similarity aspects this cannot really be determined just from looking at correlations. All that is known is that the similarity variables vary together and further testing needs to be done to determine for sure if general perceived similarity is an overarching concept to other similarity variables. It is however not theoretically possible to consider any of the other similarity aspects an overarching concept to general perceived similarity as all the other similarity aspects are more precisely defined.

General perceived similarity mediated gender differences in interest in the preliminary mediational analysis and this is in line with organizational fit theory and the ASA framework (Schneider, 1987). According to the theory, people are attracted to organizations based on perceived or actual fit between personal and organizational characteristics. In the current study if participants were interested in a post-graduate career then they also perceived themselves as generally similar to researchers. People who perceive themselves as similar to researchers are also more attracted to post-graduate academic career and as Wyer et al. (2010) argue the image that people have of a researcher will influence views on who can be a researcher and who is best suited for the occupation. Given that research has shown that the image of a researcher/scientist is consistent with the male stereotype to a larger extent than with the female stereotype (Sinclair et al., 2013) and the implicit attitudes of scientists were associated with men to a larger extent than women (Nosek et al., 2009) this can affect students considering a post-graduate academic career. This stereotype of researchers/scientists can act as a filter for women who by default do not fit in, in the academia, due to the stereotype of a researcher/scientist being considered male. As was shown by the preliminary analysis, the mediating relationship showed that women were less interested in a post-graduate academic career because they felt dissimilar to how they perceive researchers in general. Exactly what this dissimilarity is due to is difficult to know just by looking at the mediator perceived general similarity but several mediators were tested in the current study in order to get a more specific insight to why gender differences in interest in a post-graduate academic career exist.

Perceived similarity in personality. Perceived similarity in personality gained support as a mediator of gender differences in interest in post-graduate academic career and could alone explain these gender differences in the final regression model. There is a large body of research that has investigated personality in work in relation to fit theory (for a review see; Ryan & Kristof-Brown, 2003). To my knowledge only one study (Young &

Hurlic, 2007) has investigated the relationship between agentic and communal traits in relation to person-environment fit. This is unfortunate since research has shown that occupations that are either male- or female-dominated perpetuate gender-typing and individuals not belonging to the dominant gender are less likely to pursue a career within that occupation (Glick et al, 1995).

According to social role theory (Eagly & Karu, 2002) agentic and communal traits have become normative gender stereotypes, suggesting that not only are women and men supposed to have certain traits but also they should have these traits according to the norm. Sinclair et al.'s (2013) research showed that the stereotype of researchers were more consistent with the male than the female stereotype. If women's personality characteristics are inconsistent with the personality characteristics associated with the occupation researcher then according to the lack of fit model (Heilman, 2001), women will suffer from a perceived lack of fit to the researcher occupation. Normative social influence affects people given that people in general wish to be accepted and belong to the group. This affects both men and women and occupational stereotypes get integrated with the ability to see oneself within an occupation. In the current study, the mediating relationship between perceived similarity in personality and interest in a post-graduate academic career suggested that women are less interested in a post-graduate academic career due to that women perceive themselves as dissimilar in personality to researchers. Exactly on which type of personality traits women feel dissimilar to researchers are not known although a more specific similarity measurement was also used to assess fit between self-image and researcher-image.

Fit between self-image and researcher-image. Similarity in personality was also investigated on a more specific measurement testing fit between researcher-image and self-image in relation to interest in post-graduate academic career. The response surface analysis showed that both researcher competence ratings and self competence ratings increased as the interest in post-graduate academic career increased however this increase was not significant. Further assessing the curvature of the line of incongruence showed that researcher competence ratings and self competence ratings decreased as interest in post-graduate academic career decreased but the decrease was not significant. The relationship of similarity between self-image and researcher-image in relation to interest in post-graduate academic career was not strong enough to assume that there is fit.

It is possible that the measurement used to assess self-image and researcher-image might not have been specific enough to measure fit between self-image and researcher-image. The reasons for using the Stereotypes of Scientists scale was that the scale has been designed

to measure individuals perceptions of scientists (Wyer et al., 2010) and that it contains both one professional and one interpersonal competencies dimension. Given that women traditionally seek careers in fields associated with communal traits such as caring and cooperation and that men traditionally seek careers in fields associated with agentic traits such as competitiveness and independence (Bem, 1974; Cejka & Eagly, 1999; Eagly & Steffen, 1986) and that several gender stereotypes, such as family oriented and independent, were included in the original Stereotypes of Scientists scale, this scale was chosen to measure personality characteristics in self-image and researcher-image. It is possible that the personality characteristics of the Stereotypes of Scientists scale are personality characteristics not only describing stereotypes of scientists but academics in general and not all academics are interested in a post-graduate academic career.

It is also possible that another measurement of personality characteristics might have been better suited to measure fit between self-image and researcher-image. Possibly a measurement of agentic and communal characteristics like Sinclair et al. used might have been better to capture fit between self-image and researcher-image. All though the current study did not gain support for that a fit between self-image and researcher-image increases interest in post-graduate academic career, it would be interesting to investigate a possible fit in relation to interest in post-graduate career using other personality characteristics measurements.

There were some interesting results from the Stereotypes of Scientists scale however. There were no significant gender differences in the ratings of researcher-image on interpersonal competencies dimension. However on the professional competences dimensions women rated researchers higher than men did. Men on the other hand rated their self-image higher on the professional competencies dimension than did women and women rated their self-image higher on the interpersonal competencies dimension than did men. Women considering themselves higher on interpersonal competencies than men and men considering themselves higher on professional competencies than women are hardly surprising given that traditional gender stereotypes are pervasive, normative and get incorporated into people's self-image (Eagly & Karu, 2002; Prentice & Carranza, 2002). However the gap in ratings of self-image and researcher-image on the professional competencies dimension is much more substantial for women than men. Women consider researchers more competent than do men but also consider themselves less competent than the men do. Not only do women perceive themselves as dissimilar to researchers on a variety of similarity aspects but women also consider themselves as less competent than men and consider researchers more competent

than men do. This might be a partial explanation as to why women are less interested in a post-graduate academic career.

Perceived similarity in occupational goals. Perceived similarity in occupational goals was supported as a mediator of gender differences in interest in post-graduate academic career. Depending on which regression model is chosen, similarity in personality or similarity in occupational goals could alone explain gender differences in interest in a post-graduate academic career. The purpose of the current study was not to suggest that similarity in personality is more important than similarity in occupational goals, or vice versa. Both of these similarity aspects were considered of importance. One possible explanation to that both similarity in personality and similarity in occupational goals could alone explain gender differences in interest in post-graduate academic career is that there were high inter correlations between the mediators. The best solution to dealing with multiple mediators would be to use bootstrapping, in order to tell individual mediators contribution to the model. For a discussion on multiple mediators and bootstrapping, see the limitations section of this discussion.

In the current study, the mediating relationship suggested that women were less interested in a post-graduate academic career than men because they perceive themselves as having dissimilar occupational goals to researchers. Exactly which kind of occupational goals it is that women consider themselves dissimilar to researchers is not known in the current study. Diekman et al. (2010; 2011) suggest that men and women have different goals and the career interest individuals have depend on which goals these interests are perceived congruent with. Diekman et al. (2010) showed that careers within the STEM fields are considered incongruent with communal goals and given that communal goals are especially important to women (Diekman et al., 2011) this can be an explanation as to why there are so few women with the STEM fields. It is possible that one reason as to why women are less interest in a post-graduate academic career is that they perceive the occupational goals as incongruent with their own goals. The social sciences are not equivalent to the STEM fields but considering that the researcher stereotype is considered more consistent with the male stereotype than the female stereotype, both on explicit level (Sinclair et al., 2013) and on implicit level (Nosek et al., 2009) then post-graduate academic career might be considered to be less congruent with communal goals.

Perceived similarity in values. In the preliminary mediational analyses, perceived similarity was a mediator of gender differences in interest in post-graduate academic career

but in the final regression model was made redundant since after entering personality or occupational goals, no other mediators were needed to explain differences in interest.

It is possible that having the same values as people within an organization could increase interest in joining the organization. According to Austin (2002), there is a socialization process to an academic career which begins with students assuming the values and attitudes of the group they wish to join. If one believes that there is a fit between one's own values and the values of the group it is possible that joining the group will be more attractive. This of course assumes that everyone in the group seem to have the same values.

In the current study, it is not known which values participants had in mind when rating that they had similar or dissimilar values to the typical researcher. Ryan and Kristof-Brown (2003) argue that values are what people believe are important in life and what goals people wish to pursue. If values can be considered goals people wish to pursue this could explain the strong correlation between similarity in values and similarity in occupational goals. In order to know which values participants had in mind in the current study, more research is needed. However, what is known is, that the mediating relationship suggested that women are less interested than men in a post-graduate academic career due to that they perceive themselves as having dissimilar values to the typical researcher.

Perceived similarity in hobbies. In the preliminary mediational analyses, perceived similarity in hobbies gained support as a mediator. I was not expecting perceived similarity in hobbies to be a mediator although research does suggest that irrelevant and stereotypical characteristics can be of importance when choosing an occupation (Hannover & Kessels, 2004). Although hobbies might not be completely irrelevant when choosing an occupation as a better job fit might be obtained if one chooses an occupation that is a hobby. Similarity in hobbies to one's coworkers does however seem relatively irrelevant. It is quite possible to have a good working relationship with coworkers who have different hobbies than oneself. The fact that perceived similarity in hobbies gained support in the preliminary analyses might be support for self-to-prototype matching theory.

Early research of the scientist stereotype showed that the general image of the scientist contained characteristics such as "working excessively long hours" (Chambers, 1983). This could be an explanation as to why similarity in hobbies was of importance to the participants in the current study. If the image of the scientist is someone who works very long hours, then it is possible to consider work being a hobby for the scientist as excessively long working hours will be in work hours as well as spare time. If participants consider research their hobby then it would make sense that they consider themselves as similar in hobbies to the typical

researcher. This is only speculations and in order to know which type of hobbies are important for differences in interest in post-graduate academic career further research is needed. In the current study, women perceived themselves as having less similarity in hobbies to the typical researcher than the male participants and the mediating relationship suggested that this caused women to be less interested in a post-graduate academic career.

Similarity in physical appearance. Similarity in physical appearance was not a mediator in the current study. Although theoretically it is possible that physical appearance could be of importance (Hannover & Kessels, 2004), I was not expecting physical appearance to be of significance in the study. The reasons for adding physical appearance to the similarity aspects was that I was aiming to do theory testing with multiple mediators and according to self-to-prototype matching theory, completely irrelevant characteristics can be of importance when choosing a profession. Another reason for adding physical appearance to the similarity aspects was that Cheryan and Plaut (2010) asked participants to rate how similar they believed they were to college majors within different disciplines and when translating this similarity question to Swedish, it could very well be understood as similar in physical appearance. In order to know for sure that this was not what participants had in mind when answering general similarity questions, similarity in physical appearance was added to the similarity aspects. It is however possible that similarity in physical appearance might be of importance in some occupations but when it comes to the occupation researcher similarity in physical appearance was not of importance in the current study.

Similarity in Competence and Self-Efficacy as Possible Mediators

Competence was assessed on multiple levels in the current study. Participants were asked how similar they perceived themselves to be in competence to the typical researcher and were also asked to indicate career self-efficacy, task-specific self-efficacy and four ability beliefs. Neither similarity in competence nor any of the different levels of abstractions of self-efficacy gained support as mediators of interest in post-graduate academic career in the current study. The hypothesis that self-efficacy mediates interest in post-graduate academic career (Hypothesis 3) was not supported.

According to expectancy-value theory, people choose careers depending on how well they are expecting to do within the career (Wigfield & Eccles, 2000). If people are interested in a post-graduate career then they ought to value this career and expect to do well within the career according to the theory. However neither similarity in competence nor any of the self-efficacy levels were related to interest in the current study.

There were no significant sex differences in the current study in mathematics ability belief or language ability belief. Cooperative ability reached significant gender differences in the current study with women scoring higher on cooperative ability than men, which is in line with previous research showing that women are considered to be more helpful and have a desire to foster relations (Eagly & Steffen, 1986). However cooperative ability was not related to interest in post-graduate career.

Technical ability also reached significant gender differences in the current study with men rating their technical ability higher than women. Technical ability was not related to interest in a post-graduate career and neither a mediator in the current study. The sex differences in technical ability is however interesting even if it was not related to interest in a post-graduate career. The effect size of sex differences in technical ability was large. See Table 1 for means, standard deviations and effect sized on all variables that reached significant gender differences in the current study. Given this large effect size, it is reasonable to assume that men and women consider themselves to differ in technical ability. All though technical ability belief was not related to interest in post-graduate academic career it is possible that technical ability belief is related to interest in other careers. For example women are underrepresented internationally within the STEM fields (Diekmann et al., 2010) and it is likely to assume that technical ability belief might be related, at least in the fields technology and engineering, to interest within those fields. Given this knowledge, it is possible that technical ability belief might be able to explain, at least in part, women's underrepresentation within those fields. Mellström (2004) argues that technology and machines are a major part of men's life which is highly gender-specific and which excludes women and facilitate forming homosocial bonds. Future studies to investigate technical ability belief in relation to interest in other occupations and academic fields are recommended.

In the current study there were also no significant gender differences in career self-efficacy. In Tellhed's study (2013) women reported lower career self-efficacy in relation to the occupation researcher. One possible explanation the lack of gender differences in self-efficacy in the current study is that the experimental leader was a woman. In one study, using a female experimental leader protected women's mathematics test performance in comparison to when a male experimental leader was administrating the test (Marx & Roman, 2002). Marx and Roman showed that women underscored on a mathematics test when the experimental leader was male but men's and women's test scores were equal when a woman was administrating the test. Further women rated lower performance self-esteem when the experimental leader was a man. Marx and Roman interpreted the results as a female

experimental leader could be considered a competent role model for the female participants and that this led to women's test scores being protected after encountering the role model. If having a female experimental leader administering tests protected women's mathematics ability and allowed female participants to perform on the same level as men, as was shown in Marx and Romans study, then it is possible that self-efficacy scores was protected in the current study by having a female experimenter.

In the current study, the experimental leader was from the same in-group (e.g. women) as the female participants and also a student which makes it likely that the experimental leader will be someone female students can consider similar to themselves. I was aware of the possibility of this influence and because of that never announced that I was a master student or that the questionnaire was part of my thesis when introducing the questionnaire. However it is still possible that participants reached conclusions while I was introducing the questionnaire. On one occasion, a student asked if I was a researcher, which of course was denied, but given that one participant thought this, it is possible that on other occasions, participants have reached similar conclusions and not asked about it.

All though it is unfortunate if the current study elicited role model effects, as this is in essence experimental leader effects, and that was not what the current study aimed to investigate, it is however positive if women's self-efficacy could be enhanced simply by having a female experimental leader. There are no reasonable reasons as to why women should report lower levels of self-efficacy given that women are just as competent as men and low self-efficacy will affect performance and career choices. All though an increase in self-efficacy by having a female experimental leader will be temporarily and brief, this does suggest that more female role models are needed in areas where women are underrepresented.

Limitations of the Current Study

Generalisability. The population in the current study was students within the social sciences, as I believe that there can be a difference in the view of researchers/scientists among students within social sciences and natural sciences. Given the large gender gap of professors within the natural sciences (HSV, 2008:20) it is quite likely that gender differences in interest in post-graduate academic career will be even larger among natural sciences students but I believe this should be investigated in a separate study in order to isolate the gender imbalance within different sciences. Even though the social sciences are more gender balanced, given that a more equal proportion of professors cannot be expected before year 2030 (SOU 2011:1), it is still of interest to investigate students within the social sciences interest in a post-graduate academic career. Of course these results cannot be generalized outside the

population of students within the social sciences departments. It might be possible to generalize the results to other universities but only to the population of students within the social sciences departments.

Possible reactivity. When using explicit measures, like a questionnaire, there is always the possibility of reactivity. For example, one possible explanation to there not being any gender differences in estimated competence and self-efficacy is that this could be a reaction to the measure and participants wanting to rate themselves as competent. Adding implicit measures to studies can be a solution to dealing with reactivity but would not have been suitable with the current study.

Similarity mediators. In the current study, participants were asked how similar they perceive themselves to a researcher on multiple similarity characteristics. It is not possible to know exactly what kind of characteristics participants had in mind when answering these questions. All similarity aspects were assessed by asking participants how similar they perceived themselves to a researcher on a specific aspect. Additionally, similarity in personality and similarity in competence were measured more specifically by asking participants to rate self-image and researcher-image on several of personality characteristics and similarity in competence was assessed on three levels of abstractions however none of the other mediators were measured on a more specific level. When a participant rate for example the question “how similar are your occupational goals to the typical researcher’s occupational goals”, it is not possible to know which occupational goals the participant has in mind. It would be preferable if all similarity aspects were measured more specifically however this would have made the questionnaire excessively long and would subject the study to exhaustion effects. I do not claim to know what the participants had in mind when they were answering these similarity questions and further studies are needed to determine if for example agentic and communal goals are important in relation to interest in a post-graduate academic career.

Analyzing multiple mediators. Including several mediators in one model should not be considered a limitation. Establishing a relationship between gender and interest in post-graduate academic career through correlation shows that the variables are related but is insufficient in order to discuss causation. In the current study it has been shown that gender affects interest in post-graduate academic career through perceived similarity mediators and this helps to explain the correlation process. The current study was designed to use a bootstrapping macro provided by Preacher and Hayes (2008) which allows for testing several mediators and provides the indirect effect for all mediators as a group as well as the indirect

effects of each individual mediator. This macro however turned out to be incompatible with the language of the existing data analyzing package and as such could not be used. Analyses of the mediational variables instead were performed individually using Baron and Kenny's (1986) instructions for single mediation and the Sobel Test (Sobel, 1982) to analyze significance. Given that the mediators are correlated, the indirect effects are attenuated and it is not possible to consider the effects on the outcome from several mediators as unique effects. What is known from the current study is that depending on which regression model is chosen, similarity in personality or similarity in occupational goals can alone explain gender differences in interest in post-graduate career. However it is likely that more than one similarity variable effects interest in post-graduate career and it would be preferable to test the mediators in one model and provide the effect of the mediators as a group.

Depending on which model chosen, similarity in personality or similarity in occupational goals, can explain gender differences in interest in post-graduate career. These mediators were both considered of theoretical importance and they are not so theoretically diverse so it makes sense taking a stand on one against another. As such, testing all the mediators in one model to provide an indirect effect of all mediators as a group would be of interest.

Future Research and Conclusions

The current study showed that women perceive themselves as dissimilar to the typical researcher on several similarity aspects and that this dissimilarity mediated gender differences in interest in a post-graduate academic career. The current study was conducted with participants from the social sciences department at Lund University and cannot be generalized to all other departments but it would be interesting to conduct a similar study among student from natural sciences departments as similar findings can be expected among students in disciplines where gender imbalances exist across majors.

In the current study it is not known what participants have in mind when replying to the similarity questions and further studies using more specific measurements for example measuring agentic and communal traits and goals would be of interest.

In occupations that are gender-specific and dominated by either men or women, conducting studies on perceived similarity in agentic and communal traits and also agentic and communal goals in relation to interest in the occupation is recommended. To my knowledge only one study (Young & Hurlic, 2007) have investigated similarity in agentic and communal traits in relation to person-environment fit and given the pervasiveness of gender stereotypes, traditional gender traits might help explain why some occupations are male or

female dominated. Within the STEM fields, studies using technical ability belief are also recommended given the large effect size shown in the current study in how men and women differ in their belief in their technical ability.

The current study showed that women are less interested in a post-graduate academic career because they perceive themselves as dissimilar to the typical researcher. This could be due to the stereotypical image of the researcher being more related to the stereotypical image of a man than that of a woman as previous research has shown (Nosek et al., 2009; Sinclair et al., 2013). One possible solution, in making post-graduate career more relatable to women, is through relatable role models (Marx & Roman, 2002). Relatable role models could change women's perceptions of the people within the field and with a higher perceived similarity to the people in the field; a greater interest in the field should follow.

References

- Austin, A. E. (2002). Preparing the next generation of faculty: Graduate school as socialization to the academic career. *The Journal of Higher Education*, 73(1), 94-122. doi: 10.1353/jhe.2002.0001
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215. doi: 10.1037/0033-295X.84.2.191
- Baron, R.M., & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and Social Psychology*, 51(6), 1173-1182. doi: 10.1037/0022-3514.51.6.1173
- Bem, S. L. (1974). The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology*, 42, 155-162. doi: 10.1037/h0036215
- Betz, N.E., & Hackett, G. (1981). The relationship of career-related self-efficacy expectations to perceived career options in college women and men. *Journal of Counseling Psychology*, 28(5), 399-410. doi: 10.1037/0022-0167.28.5.399
- Betz, N.E., & Hackett, G. (1983). The relationship of mathematics self-efficacy expectations to the selection of science-based college majors. *Journal of Vocational Behavior*, 23, 329-345. doi: 10.1016/0001-8791(83)90046-5
- Björklund, F., Bäckström, M., & Jörgensen, Ö. (2011). In-group ratings are affected by who asks and how: Interactive effects of experimenter group-membership and response format. *The Journal of Social Psychology*, 151(5), 625-634. doi: 10.1080/00224545.2010.522623
- Brainard, S.G., & Carlin, L. (1998). A six-year longitudinal study of undergraduate women in engineering and science. *Journal of Engineering Education*, 87, 369-375. doi: 10.1002/j.2168-9830.1998.tb00367.x
- Cejka, M.A., & Eagly, A.H. (1999). Gender-stereotypic images of occupations correspond to the sex segregation of employment. *Personality and Social Psychology Bulletin*, 25, 413-423. doi: 10.1177/0146167299025004002
- Chambers, D.W. (1983). Stereotypic images of the scientist: The draw-a-scientist test. *Science Education*, 67(2), 255-265. doi: 10.1002/sce.3730670213
- Cheryan, S., & Plaut, V.C. (2010). Explaining underrepresentation: A theory of precluded interest. *Sex Roles*, 63, 475-488. doi: 10.1007/s11199-010-9835-x
- Cross, S.E., & Madson, L. (1997). Models of the self: self-construals and gender. *Psychological Bulletin*, 122(1), 5-37. doi: 10.1037/0033-2909.122.1.5

- DiDonato, L., & Strough, J. (2013). Do college students' gender-typed attitudes about occupations predict their real-world decisions? *Sex Roles, 68*, 536-549. doi: 10.1007/s11199-013-0275-2
- Diekman, A.B., Brown, E.R., Johnston, A.M., & Clark, E.K. (2010). Seeking congruity between goals and roles: A new look at why women opt out of science, technology, engineering, and mathematics careers. *Psychological Science, 21*(8), 1051-1057. doi: 10.1177/095679610377342
- Diekman, A.B., Clark, E.K., Johnston, A.M., Brown, E.R., & Steinberg, M. (2011). Malleability in communal goals and beliefs influences attraction to STEM careers: Evidence for a goal congruity perspective. *Journal of Personality and Social Psychology, 101*(5), 902-918. doi: 10.1037/a00251999
- Diekman, A.B., & Eagly, A.H. (2000). Stereotypes as dynamic constructs: Women and men of the past, present and future. *Personality and Social Psychology Bulletin, 26*, 1171-1188. doi: 10.1177/0146167200262001
- Eagly, A.H., & Karau, S.J. (2002). Role congruity theory of prejudice toward female leaders. *Psychological Review, 3*, 573-598. doi: 10.1037//0033-295X.109.3.573
- Eagly, A.H., & Steffen, V.J. (1986). Gender stereotypes, occupational roles, and beliefs about part-time employees. *Psychology of Women Quarterly, 10*(3), 252-262. doi: 10.1111/j.1471-6402.1986.tb00751.x
- Eccles, J.S. (1987). Gender roles and women's achievement-related decisions. *Psychology of Women Quarterly, 11*(2), 135-172. doi: 10.1111/j.1471-6402.1987.tb00781.x
- Eccles, J.S., & Wigfield, A. (2002). Motivational beliefs, values and goals. *Annual Review of Psychology, 53*, 109-132. doi: 10.1146/annurev.psych.53.100901.135153
- Edwards, J.R. (2002) Alternatives to difference scores: Polynomial regression analysis and response surface methodology. In F. Drasgow & N.W. Schmitt (Eds.), *Advances in measurement and data analysis* (pp. 350-400). San Francisco: Jossey-Bass.
- Edwards, J.R., & Cable, D.M. (2009). The value of value congruence. *Journal of Applied Psychology, 94*(3), 654-677. doi: 10.1037/a0014891
- Edwards, J.R., & Parry, M.E. (1993). On the use of polynomial regression equations as an alternative to difference scores in organizational research. *Academy of Management Journal, 36*, 1577-1613. doi: 10.2307/256822
- Eriksson, K., & Lindholm, T. (2007). Making gender matter: The role of gender-based expectancies and gender identification on women's and men's math performance in

- Sweden. *Scandinavian Journal of Psychology*, 48, 329-338. doi: 10.1111/j. 1467-9459.2007.00588.x
- Forester, M., Kahn, J.H., & Hesson-McInnis, M.S. (2004). Factor structures of the three measures of research self-efficacy. *Journal of Career Assessment*, 12, 3-16. doi: 10.1177/1069072703257719
- Glick, P., Wilk, K., & Perreault, M. (1995). Images of occupations: Components of gender and status in occupational stereotypes. *Sex Roles*, 32, 565-582. doi: 10.1007/BF01544212
- Hackett, G. (1995). Self-efficacy in career choice and development. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp. 232-258): New York, NY, US: Cambridge University Press
- Hackett G., & Betz, N.E. (1981). A self-efficacy approach to career development of women. *Journal of Vocational Behavior*, 18, 326-339. doi: 10.1016/0001-8791(81)90019-1
- Hannover, B., & Kessels, U. (2004). Self-to-prototype matching as a strategy for making academic choices. Why high school students do not like math and science. *Learning and Instruction*, 14, 51-67. doi: 10.1016/j.learninstruc.2003.10.002
- Heilman, M.E. (2001). Description and Prescription: How gender stereotypes prevent women's ascent up the organizational ladder. *Journal of Social Issues*, 57, 657-674. doi: 10.1111/0022-4537.00234
- Hogan, R., & Blake, R. (1999). John Holland's Vocational Typology and Personality Theory. *Journal of Vocational Behavior*, 55(1), 41-56. doi: 10.1006/jvbe.1999.1696
- Holland, J.L. (1966). *The psychology of vocational choice: A theory of personality type and model environments*. Waltham, MA: Blaisdell.
- HSV (2008:20). *Kvinnor och män i högskolan* [Women and men in higher education]. Stockholm: Högskoleverket.
- Kessels, U., & Taconis, R. (2012). Alien or alike? How the perceived similarity between the typical science teacher and a student's self-image correlates with choosing science at school. *Research in Science Education*, 42(6), 1049-1071. doi: 10.1007/s11165-011-9230-9
- Kristof-Brown, A. L., Zimmerman, R.D., & Johnson, E.C. (2005). Consequences of individuals' fit at work: A meta-analysis of person-job, person-organization, person-group and person-supervisor fit. *Personnel Psychology*, 58, 281-342. doi: 10.1111/j.1744-6570.2005.00672.x

- Litzler, E., & Young, J. (2012). Understanding the risk of attrition in undergraduate engineering: Results from the project to assess climate in engineering. *Journal of Engineering Education*, *101*, 319-345. doi: 10.1002/j.2168-9830.2012.tb00052.x
- Marx, D.M., & Roman, J.S. (2002). Female role models: Protecting women's math test performance. *Personality and Social Psychology Bulletin*, *28*(9), 1183-1193. doi: 10.1177/01461672022812004
- Maurer, T.J., & Pierce, H.R. (1998). A comparison of likert scale and traditional measures of self-efficacy. *Journal of Applied Psychology*, *83*(2), 324-329. doi: 10.1037/0021-9010.83.2.324
- McLean, H.M., & Kalin, R. (1994). Congruence between self-image and occupational stereotypes in students entering gender-dominated occupations. *Canadian Journal of Behavioural Science*, *26*(1), 142-162. doi: 10.1037/0008-400X.26.1.142
- Mellström, U. (2004). Machines and masculine subjectivity: Technology as integral part of men's life experiences. *Men and Masculinities*, *6*, 368-382. doi: 10.1177/1097184X03260960
- Nosek, B.A., Smyth, F.L., Sriram, N., Lindner, N.M., Devos, T., Ayala, A., ... Greenwald, A.G. (2009). National differences in gender-science stereotypes predict national sex differences in science and math achievement. *PNAS Proceedings of the National Academy of Sciences of the United States of America*, *106*, 10593-10597. doi: 10.1073/pnas.089921106
- Overall, N.C., Deane, K.L., & Peterson, E.R. (2011). Promoting doctoral students' research self-efficacy: combining academic guidance with autonomy support. *Higher Education Research & Development*, *30*(6), 791-805. doi: 10.1080/07294360.2010.535508
- Ostroff, C., & Judge, T.A. (Eds.) (2012). *Perspectives on organizational fit*. New York, NY: Psychology Press.
- Ostroff, C., & Schulte, M. (2012). Multiple perspectives of fit in organizations across levels of analysis. In C. Ostroff & T.A Judge (Eds.), *Perspectives on organizational fit* (pp. 3-69). New York, NY: Psychology Press.
- Preacher, K.J., & Hayes, A.F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*(3), 879-891. doi: 10.3758/BRM.40.3.879

- Prentice, D.L., & Carranza, E. (2002). What women should be, shouldn't be, are allowed to be and don't have to be: The contents of prescriptive stereotypes. *Psychology of Women Quarterly*, 26(4), 269-281. doi: 10.1111/1471-6402.t01-1-00066
- Ryan, A.M., & Kristof-Brown, A. (2003). Focusing on personality in person-organization fit research: Unaddressed issues. In M.R. Barrick & A.M. Ryan (Eds.), *Personality and work: Reconsidering the role of personality in organizations* (pp. 262-288). San Francisco: Jossey-Bass.
- Sainz, M., & Eccles, J. (2012). Self-concept of computer and math ability: Gender implications across time and within ICT studies. *Journal of Vocational Behavior*, 80, 486-499. doi: 10.1016/j.jvb.2011.08.005
- Schneider, B. (1987). The people make the place. *Personnel Psychology*, 40, 437-454. doi: 10.1111/j.1744-6570.1987.tb00609.x
- Schneider, B., Goldstein, H.W., & Smith, D.B. (1995). The ASA framework: An update. *Personnel Psychology*, 48, 747-773. doi: 10.1111/j.1744-6570.1995.tb01780.x
- Sekiguchi, T. (2004). Person-organization fit and person-job fit in employee selection: A review of the literature. *Osaka Keidai Ronshu*, 54(6), 179-196.
- Shanock, L.R., Baran, B.E., Gentry, W.A, Pattison, S.C., & Heggstad, E.D. (2010). Polynomial regression with response surface analysis: A powerful approach for examining moderation and overcoming limitations of difference scores. *Journal of Business and Psychology*, 25, 543-554. doi: 10.1007/s10869-010-9183-4
- Sinclair, S., Tellhed, U., & Björklund, F. (2013). The relation between students' implicit researcher-gender associations and perceptions of a research career. *Lund Psychological Reports*, 13 (01).
- Sobel, M.E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology*, 13, 290-312. Doi: 10.2307/270723
- SOU (2011:1) *Svart på vitt: om jämställdhet i akademien: Betänkande av delegationen för jämställdhet i högskolan*[Black on white: on equality in the academia: reflections of delegation of equality in higher education]. Stockholm: Fritzes offentliga publikationer.
- Su, R., Rounds, J., & Armstrong, P.I. (2009). Men and Things, women and people: A meta-analysis of sex differences in interests. *Psychological Bulletin*, 135(6), 859-884. doi: 10.1037/a0017364

- Tellhed, U. (2013). *Learning about the gender imbalance in academia increases male students' interest in post graduate school and causes social identity threats for the female students*. Manuscript in preparation.
- Twenge, J.M. (1997). Changes in masculine and feminine traits over time: A meta-analysis. *Sex Roles, 36*, 305-325. doi: 10.1007/BF02766650
- Van Vianen, A.E.M. (2000). Person-organization fit: The match between newcomers' and recruiters' preferences for organizational cultures. *Journal of Applied Psychology, 86*, 113-149. doi: 10.1111/j.1744-6570.2000.tb00196.x
- Wigfield, A., & Eccles, J.S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology, 25*, 68-81. doi: 10.1006/ceps.1999.1015
- Wigfield, A., Tonks, S., & Klauda, S.L. (2009). Expectancy-value theory. In K.R. Wentze, & A. Wigfield (Eds.), *Handbook of motivation in school* (pp. 55-76). New York: Routledge Taylor Francis Group.
- Wyer, M., Schneider, J., Nassar-McMillan, S., & Oliver-Hoyo, M. (2010). Capturing stereotypes: Developing a scale to explore U.S. college students' images of science and scientists. *International Journal of Gender, Science and Technology, 2*(3), 381-415.
- Young, A.M., & Hurlic, D. (2007). Gender enactment at work: The importance of gender and gender-related behavior to person-organizational fit and career decisions. *Journal of Managerial Psychology, 22*(2), 168-187. doi: 10.1108/02683940710726429