

## Abstract

The purpose of this study was to investigate attitudes towards gender and predicates denoting intelligence among Swedish and U.S. citizens between 20 and 35 years ( $N = 72$ ). Research suggests that stereotypes on gender and cognitive ability begin to affect children around six years of age. These stereotypes may affect children over time and influence what career paths they will one day pursue. Further, it has been suggested that parents' own stereotypes on gender and intelligence are projected onto their children. For this reason, I would argue that it is important to explore the attitudes on gender and intelligence as those will affect the next generation.

By distributing two online questionnaires, one in Swedish and one in English, I investigated to what degree the "brilliance = male property" stereotype was activated when the participants were confronted with predicates denoting (e.g., *brilliant*) or connoting (e.g., *professor*) high cognitive ability. Moreover, I compiled a corpus study in order to explore, first, the gender distribution of these intelligence predicates, and second, the linguistic contexts in which they occur.

The results of the corpus study suggest that predicates that are vague but semantically strong, e.g., *genius*, *mastermind* and *scientist*, tend to have a larger male bias than predicates that are semantically weaker, e.g., *smart* and *intelligent*. The results of the questionnaires, on the other hand, did not support the claim that words of intelligence have a male bias. However, a strong female bias could be observed, which suggests that the predicates of intelligence are not gender-neutral.



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A Comparative Study of Attitudes of Young Swedes and  
North Americans towards Gender and Predicates Denoting  
Intelligence

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## 1. Introduction

In 1992, Mattel Toy Company introduced the Teen Talk Barbie. When one pressed a button on her back, she said, “math class is though.” After protests, Mattel decided to drop that particular phrase (Smith and White, 2002). However, by making one of their most popular products – marketed for children, and especially girls – say, “math class is tough,” Mattel may have contributed to re-enforcing a common stereotype, that of math as a male domain. This stereotype is arguably just a part of a larger web of gender stereotypes – that men are more intelligent than women.

In a study by Furnham (2002), parents were asked to estimate their children’s IQ. Parents believed that their sons had higher IQ than their daughters, although no gender differences in, e.g., mathematic performance, have been reported until the age of 12, which is the age when girls begin to feel less confident in their mathematics abilities (Eccles 1989; Vermeer, Boekaerts & Seegers, 2000). These results provide support for the claim that the relationship between children’s actual performances and teacher/parent’s evaluations may at times be blurred by stereotypes based on the child’s gender.

Research also suggests that stereotypes on gender and cognitive ability affect children as young as six years old. In a U.S. study from 2016, Bian *et al.* sought to map out children’s acquisition of the “brilliance = male trait” stereotype. As part of their experiment, a story about a gender-anonymous person who “was really, really smart” was read aloud to a number of children. Then, the children were asked to point out the likely protagonist in set of four pictures of unknown people, two males and two females. Bian *et al.*’s results show that at the age of five, boys and girls chose a person of their own gender to a similar degree. However, six- and seven-year-old girls were significantly less ready to connect brilliance with the females in the pictures. In addition, Bian *et al.* found that children’s beliefs about brilliance and gender influenced what types of activities they are interested in (2016). Conclusively, Bian *et al.* argue that, given that these stereotypes are acquired at such a young age, they could affect children over time and influence what career paths they will want to pursue in the future.

In this paper, I will mimic the study of Bian *et al.* (2016), with the aim to investigate if their results apply on people who might soon become, or already are, parents. The reason for doing so is that it has been claimed that parents’ gender stereotypes affect children’s self-perception (Jacob and Eccles, 1992). Hence, I would argue that by raising awareness of this problem, we can minimize the effect that parents’ stereotypes of cognitive ability and gender have on the self-images of their children.

By distributing two online questionnaires, one in Swedish and one in English, I will investigate Swedish and U.S. citizens aged 20-35, in order to explore to what extent the “brilliance = male trait” stereotype is activated when they are confronted with predicates denoting (e.g., brilliant) or connoting (e.g., professor) high cognitive ability. Moreover, I will compile a corpus study in order to explore, first, the gender distribution of these intelligence predicates, and second, the linguistic contexts in which they occur.

In the next section, relevant literature for this study will be reviewed. In section 3, I will present the method and materials that constitute the basis for my analysis: a corpus study compiled from the Corpus of Contemporary American English (COCA), and two online questionnaires, one in Swedish and one in English. The results of these studies will then be presented and discussed. Finally, in section 6, a conclusion will be presented.

## 2. Background

In section 2.1., I will review some views on the distinction between the two notions *gender* and *sex*. Then, I will revise some early influential works on language and gender. In section 2.3. I will present some recent studies on gender and intelligence that this study is based upon. After that, ways in which women’s creativity has been impeded will be explored. Finally, a brief discussion on attitudes on feminism in Sweden and the U.S. will be given in section 5.4.

### 2.1 Gender or Sex?

This paper concerns young people’s presuppositions about gender in connection with certain linguistic expressions denoting high cognitive ability – e.g., *genius* and *brilliant*. First, however, we have to define *gender*. What is it, and how is it related to the notion of (biological) sex? According to, e.g., Mills (2012, p.7) and Eckert & McConnell-Ginet (2013, p. 8) gender and sex are two separate notions, where sex is a biological categorization and gender is a social construct. Bergvall & Bing (1998) and Epstein (1990) argue that even biological sex is a social construction on the basis that there are cases where surgery is performed on inter-sexed infants in order to make them ‘pass’ as male or female. Further, Bergvall & Bing call the binary dichotomy a “normative social construct” (1998). This view is shared by, e.g., Butler (1990), who calls gender “performative” and West & Zimmerman (1987) who argue that gender is something we “do,” ideas that suggest that gender is an individual expression, and not something posed upon a person. Moreover, the idea of ‘the two genders’ excludes many people,

e.g., trans people and people who are non-binary, that is, do not identify themselves as male or female.

I argue that gender cannot be assigned by anyone else than the individual itself. Although I dispute the binary dichotomy, I will in this paper use the words *boy* and *girl* when referring to children, since those are the terms used in the studies backgrounding this paper.

## 2.2 Early Works on Language and Gender

In this section, we will take a look at early works on language and gender relevant for this study – Lakoff’s *Language and a Woman’s Place* (1975), Spender’s *Man-Made Language* (1980), and Schultz’s *The Semantic Derogation of Woman* (1975).

Lakoff (1975) is an important work within the branch of feminist linguistics known as the deficit approach. Lakoff claims that there exists a distinct women’s language, recognizable through, for example, tag questions and indirectness, which not only originates from social pressure, but keep girls and women in their place. Yet, she claims that small children of any gender originally are sharing “the mother’s language,” since women are likely to spend most time with the children. At the age of around five, the children go through phases of what Lakoff calls “rough talk,” which is more widely encouraged among boys but not found as amusing and ‘fit’ for girls. However, Lakoff concludes that if the child learns how to “speak like a lady” – she will not be rewarded. On the contrary, she will experience how her thoughts and opinions are not being taken seriously as she cannot “speak precisely or [...] express herself forcefully,” in Lakoff’s words (p. 47). It should be stated, however, that Lakoff (1975) was not based on empirical evidence, but Lakoff’s own observations.

Another influential early work on gender and language is Spender (1985). Spender adheres to a branch of feminist theory referred to as the domination approach, believing that men and women are the same, but that men are using social currency to dominate women. In *Man Made Language*, she claims that “[i]t is language which determines the limits of our world, which constructs reality” and since the ones who have been entitled to create this language have been men, the language carries a male bias. The result, she argues, is a language where women cannot properly share their experiences.

Now, I would argue that Spender’s analysis is simplified. One cannot simply draw the line between females and males, but rather between the ones who have power and those who do not. My view is more in concord with that put forward in Black & Coward’s (1981) critique

of Spender (1980), that *all* men do not dominate *all* women (see also Talbot 2010: 45). To claim that would be to ignore crucial socioeconomic factors.

However, both Lakoff (1975) and Spender (1980) address the semantic asymmetry of expressions like “spinster” and “bachelor,” or “master” and “mistress,” where the male versions carry positive connotations while the female do not. *Spinster* and *mistress* are examples of the semantic development commonly observed in words denoting females, as dealt with in Schultz (1975). One reason for this tendency, Schultz argues, is what she refers to as contamination. For example, in the 19<sup>th</sup> century, the word “woman” acquired the meaning of “mistress,” and “women” had evolved into implying “intercourse with women.” These connotations resulted in a ‘need’ for a euphemism – *female*. However, Schultz reports, ‘female’ was soon contaminated as well and replaced by ‘lady.’ Schultz claims to have located “roughly a thousand words and phrases describing women in sexually derogatory terms” and that “there is nothing approaching this multitude for describing men,” which provides support for her claim that words denoting females have a tendency to acquire sexual connotations.

In this section, we have taken a brief look at some of the most influential early works on gender and language. Given the brief format of this paper, I have chosen not to include any contemporary research on gender and language, except that which deals with gender and intelligence stereotypes, which is the focus of this study and will be presented in the following section.

### 2.3 Recent Research on Intelligence Stereotypes

The aim of this paper is to study future parents’ stereotypes on gender and intelligence, as these attitudes could affect how their children will view their own cognitive ability. This section will deal with, first, studies on parents’ attitudes on gender and intelligence, and second, *when* these stereotypes are acquired, and finally, possible consequences followed by these stereotypes as the children reach collage age.

A study supporting the claim that parents endorse the “brilliance = male trait” stereotype is Stephen-Davidowitz (2014), in which anonymous Google searches made by U.S. parents were analyzed. The results show that these parents were two and a half times more likely to ask Google whether their son is “gifted” than if their daughter is. Further, U.S. parents more frequently ask, “is my son a genius,” than “is my daughter a genius” (Stephen-Davidowitz, 2014). However, U.S. parents seem more concerned with their daughters’ appearance and weight than their intelligence. The parents in the study googled “is my daughter overweight?”

around twice as often as the “son” equivalent. In the article, Stephens-Davidowitz addresses the expectation that this pattern would be more apparent in conservative states, e.g., Wyoming, North Dakota, and Mississippi (Gallup, 2017), but the results revealed this pattern to be insensitive to political affiliations. In addition, Stephens-Davidowitz found no evidence of there being any decrease in these gender biases since 2004, which is as far back Google’s data reach (Stephens-Davidowitz, 2014). On the other hand, he does not mention any increase either.

For other studies supporting the claim that parents behave differently towards children, even infants, depending on the presumed gender, see Condry & Condry (1976) and Bellinger and Gleason (1982).

Now, when do children become aware of these stereotypes on intelligence and gender? Bian *et al.* (2016) conducted an experiment, consisting of three tasks, in order to answer this question. The children ( $N = 96$ , 32 in each age group) were between five and seven years old. In the first task, the children were told a story about someone “really, really, smart,” which is the researchers’ rephrasing of *brilliant*. The protagonist’s gender was not mentioned. Then, the children were asked to choose from a set of pictures of unknown people (two men, two women), who the story was about. In the second task, the children guessed from pictures of two adults (same- or different-gendered) who was “really, really smart,” and in the third task the children chose what person, in a set of unfamiliar men and women, best fit given objects (e.g., a hammer) or traits (e.g., smart). Bian *et al.* found that at the age of five, boys and girls chose people of their own gender to a similar degree. Yet, the six- and seven-year-old girls were less likely than boys to associate their own gender with brilliance. The same tendencies were observed when replicating the experiment on a larger sample of children in the same ages ( $N = 144$ ). In addition, Bian *et al.* (2016) carried out an experiment in order to measure if the stereotypes on intellectual ability affect the children’s interests, since that would suggest that they may avoid pursuing careers that are believed to demand raw brilliance. In the experiment, the children were introduced to two unfamiliar games, one said to be for children who are “really, really, smart,” and the other for children who “try really, really hard.” The games were not further explained in the article. However, Bian *et al.* asked the children if they liked the games or not, and in concord with the experiments mentioned above, girls aged six and seven were less interested than boys in the “smart” game, but more interested than the boys in the “persistence” game. Hence, these results suggest that the “intelligence = male trait” stereotype not only affects small girls’ beliefs in their own intellectual ability, but also may affect their interests, which in the long run may steer them away from careers that are believed to demand raw brilliance.

In Storage *et al.* (2016), there is support for this claim. By analyzing the word frequency of e.g., *brilliant* and *genius* in spontaneous teacher evaluations online at RateMyProfessor.com the researchers found that the number peaked in fields like philosophy, music, and mathematics. Further, Storage *et al.* argue that this suggests students of these fields readily judge people in terms of raw intelligence, instead of, e.g., hard work. However, they found that women and African-Americans who hold PhD degrees were underrepresented in these fields. Storage *et al.* (2016) report that, in the field of music, around 18 % of the U.S. PhDs are women and 0 % are African-Americans, in Philosophy around 30 % are women and 3 % are African-Americans, and in Physics 20 % are women and 2 % are African-Americans. These fields top the *brilliant* and *genius* frequency score together with Political Sciences. Political Sciences is more diverse than the fields mentioned above, with 45 % female and 6 % African-American PhD holders. However, the lowest *brilliance* and *genius* scores is found in the field of Communication, where around 65 % of the PhDs are women, and 8 % are African-Americans.

Recall the two games presented to the children in Bian *et al.* (2016) and how six- and seven-year-old girls showed less interest in the ‘smart game.’ The results in Storage *et al.* suggest that the same pattern is repeated at an adult age.

Further, not only does the use of the words *brilliant* and *genius* indicate the diversity of a given field, but students use these words to describe male instructors more often than female. Storage *et al.* analyzed the use of *brilliant* and *genius* across 18 fields and found that *brilliant* was used in a 1.81:1 male:female ratio, while *genius* showed a stronger male bias, in a 3.10:1 ratio.

The studies covered in this section suggest that there is a male bias about intelligence among U.S. parents, and that it may affect children’s view on their own intellectual ability (Bian *et al.*, 2016). However, some may not always be aware of their presuppositions and utterances carrying a bias. In Stephen-Davidowitz (2004) it was reported that U.S. parents were more concerned with their sons’ intellect than their daughters’ irrespective of whether they were living in a liberal or a conservative area. Hence, this may suggest that even progressive individuals play a part in re-enforcing gender stereotypes. For this reason, I will study if there is a male bias among Swedish and U.S. citizens towards gender and descriptions of cognitive ability.

### 2.3 A Hidden Creativity

Since creativity has long been seen as a sign of brilliance, this section will explore how women have been impeded to function as creative subjects and whether that has enabled the idea of the male genius.

The idea of the maleness of the human intellect was re-enforced by Jespersen (1922) in his chapter on “The Woman,” in which he explains the differences between ‘male’ and ‘female’ language in terms of creativity. While men’s language is, in Jespersen’s terms, “creative and imaginative,” he further argues that women are soft in the head and “follow the main road of language” (Jespersen, 1922). Again, these conclusions are based on female characters in books written by male authors. The lack of evidence did not prevent his ideas from being widely spread, however.

As mentioned in section 2.1., Lakoff (1975) talks about a distinct *women’s language*. One example of such a language, she points out, is a broad vocabulary for naming colors. On the other hand, a man uttering “this wall is mauve,” to use Lakoff’s example, is likely to be ridiculed, since this ability is considered ‘trivial’ by men with power. The question is, however: is it considered trivial because it is supposedly feminine or the other way around? Lakoff answer is that “men tend to relegate to women things that are not of concern to them, or do not involve their egos” (1975) – in other words, ‘trivial’ matters. This could serve as a part of explaining the gender division between the private and public spheres. White men in the upper classes have historically been entitled to make themselves heard in church, politics, and culture, while women have been silenced (Black & Coward 1981, Cameron, 1990, p. 4). More specifically, a woman’s place has been at home, connected to society through her status as wife, daughter, or mother, but not as an individual (Lakoff, 1975, p. 65). Men wrote and published novels and poetry – considered genres of status – while women wrote diaries and letter, which were never intended for publication. Hence, many female writers, e.g., George Eliot and J.K. Rowling, chose to publish their works under pseudonyms not only in order to be taken seriously, but also to not avert potential male readers (Cameron, 1990, p. 6, Manninen, 2018).

Aristotle explains the ‘lack of female brainpower’ by connecting intellect and physiology as he states that women should become involved in subjects like politics, since that would dry up their wombs (Talbot, 2010). Other thinkers that adhere to this view are the 19<sup>th</sup> century French philosophers Julien-Joseph Virey and Pierre Roussel, according to Paliyenko’s article *Un-Sex Genius* (2016). While Virey means that the phallus is a symbol for the tongue from which language flows and that brilliance is transmitted by sperm, Roussel argues that women are “mentally inferior” to men because of their soft and moist brains and organs. Further,

Roussel declares women to be victims of their own uteri (Paliyenko, 2016). I have found no translations of the originals and since my French is bad, I will have to trust Paliyenko's translation and analysis.

Another idea from Ancient Greece that places women in the outskirts of creativity is that of the muse. In Greek mythology, the muses were nine goddesses that inspired "learning and the arts, especially poetry and music" (OED.com). Recall the findings in Storage *et al.* (2016), where the word frequency of *genius* and *brilliant* in online teacher evaluations peaked in the field of music, which again suggests a stronger connection between these expressions and 'divine inspiration,' instead of hard work. Moreover, one instance in which the androcentric worldview is represented in the usage of the word *muse* is its tendency to be preceded by a possessive, denoting ownership, as in for example, 'the artist's muse.' I would argue that this usage perpetuates the image of the woman as object. Moreover, the 'muses' were often artists themselves, but are today rather remembered as inspiration and lovers of great male artists. For an example see, <https://artlandapp.com/10-world-famous-artists-muses/>.

To further illustrate how women's intellects have been viewed superfluous, consider the idea of 'female intuition.' Historically, it has been portrayed by men as a powerful tool. However, I would argue that the concept is filled with an empty value, based on Simone de Beauvoir's observation in *The Second Sex*, that men cherish the idea of "the true woman," but would not want to change places her (p. 26). Similar to the idea of the muse, female intuition assigns to woman the passive role, in which she masters something that, first, is not a 'psychic ability' but derives from social power relations, and second, is not benefitting her. On the contrary, I would argue that it functions as a means of sustaining the division between 'feeling' and 'reasoning,' where women are again surpassed to the private sphere, without currency to express their intellects or being taken seriously.

This section has dealt with different ways that women have been prevented from expressing their intellects and creativity. Simone de Beauvoir addresses the problem dealt with in this section as following, "One is not born a genius: one becomes a genius, and the feminine situation has up to the present rendered this becoming practically impossible" (*The Second Sex*, 1949:164).

## 2.4 Attitudes on Feminism in Sweden and the U.S.

In this section, attitudes towards feminism in Sweden and the U.S. will be explored. First, however, we will try to define feminism, as well as take a brief look at its three main waves.

Mills (2008) claims that it is constructive to talk about *feminisms* in the plural, since any feminist analysis is dependent on one's definition of gender, class, culture, ethnicity, etc. What all feminisms have in common, however, Mills argue, is a vision of gender equality and an improved situation for women. The first wave of feminism, in the 19<sup>th</sup> century and early 20<sup>th</sup> century, fought for women's rights to vote. The second wave of feminism, beginning in the U.S. in the 1960s, wanted equality in the private domain. However, in the 1990s, Third Wave Feminism emerged, led by younger feminist thinkers, like Butler, who began questioning the binary division between men and women, as mentioned in section 2.1. The new movement was also influenced by Foucault's ideas of power being manifested and expressed in everyday interactions (Mills, 2008). With Third Wave feminism trans rights was finally brought up as an important issue.

Feminism's tendency to question current norms in society makes it controversial. However, after the Swedish national election in 2014, the new government proclaimed themselves the first feminist government in the world, with a 50/50 (binary) gender distribution, and the introduction of a Minister of Gender Equality. Further, they claim to be working towards six 'sub-goals,' for example gender-equal education. In the U.S., the U.S. Department of State has an office dedicated to women's issues, which work with "gender equality, including gender-based violence, women's economic empowerment, women's participation in peace and security, and adolescent girls" (<https://www.state.gov/s/gwi/index.htm>).

In 2017, when the European Institute for Gender Equality, EIGE, presented a ranking for gender equality in the EU, Sweden was found at the top of the list. According to a survey by Yougov in 2016, 27 % of the Swedes would call themselves feminists in any context and 23 % would call themselves feminists, but not in all contexts. 43 % would not call themselves a feminist (Yougov, 2016). In the U.S., the numbers are similar: 47 % would call themselves feminists as, while 40 % state that they are not feminists (Washington Post-Kaiser Family Foundation, 2015).

In summary, there is not one unison version of feminism, although a general goal is to work against discrimination based on gender. Further, feminism has a tendency to challenge current societal norms, which may explain why attitudes towards feminism are rather polarized, both in Sweden and the U.S.

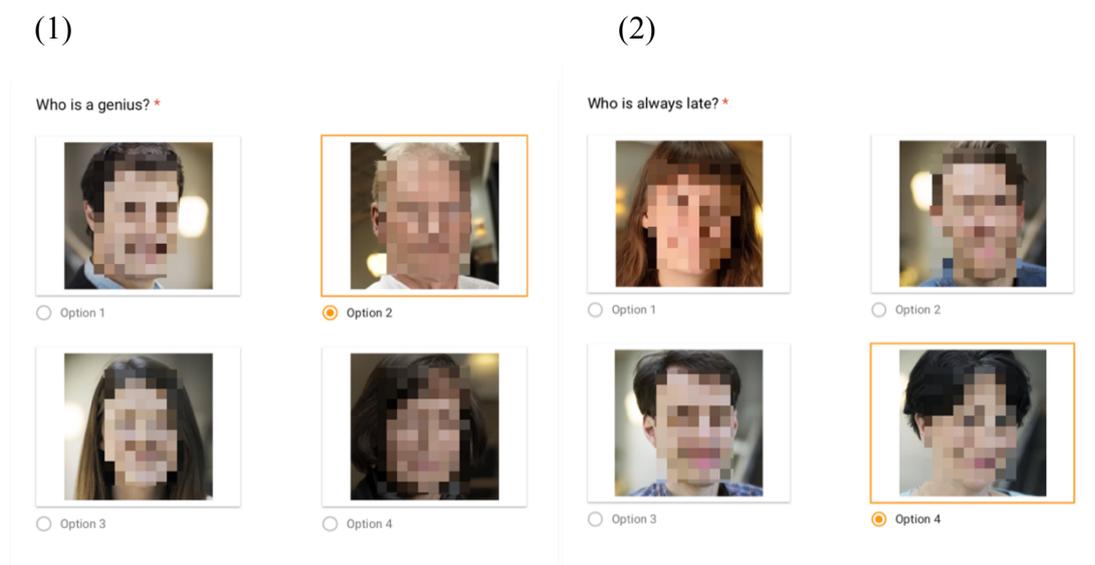
### 3. Method and Materials

The purpose of this paper is to explore whether the “brilliance=male trait” stereotype is activated when young Swedish and U.S. citizens are exposed to descriptions denoting or connoting intelligence. To answer this question, I have compiled an online questionnaire and conducted a small corpus study.

#### 3.1 The Questionnaire

To explore if descriptions of intelligence are considered male traits, I mimicked the experiment in Bian *et al.* (2016) where children were shown images of unfamiliar persons, whereupon they were asked to guess who was brilliant.

My sample consists of 70 Swedish and American citizens between 20-35 years. The reasons for comparing Swedish and U.S. data are, first, the substantial impact American culture and politics has on Sweden and many Swedes and second, the fact that much of the researched referred to in the background section is based on U.S. data. The online questionnaires were built in Google forms and can be found in Appendix 1. They were identical, except for one being in English and one in Swedish. The survey consisted of two parts: the first part collected demographic information about the informant, and the second part consisted of one practice item followed by the 38 questions that were analyzed in this paper. All questions were formulated like “Who is (a/an) X?” as is shown in example (1) and (2).



Every question was presented together with pictures of four individuals, two women and two men. The informants were instructed to choose which picture they considered best fit the given

description. Only one option could be chosen, but the informants were able to return to previous questions, which arguably could have affected the spontaneity of the answers. After having three people piloting the survey, it was distributed through my personal social media channels. My intention was that all pictures should only be used once. However, one picture appeared in both *professional* and *expert* but given that these items were separated by 24 questions, I decided not to exclude them. One item, *Who is a drunk?*, was excluded since there were three images of women, instead of two.

The images used in the questionnaires were retrieved from Lund University Bild- och Mediebank 'Image- and Media bank,' for which I gained license with the condition that they would not be included in the published version of this paper. In line with my definition of gender, it is not possible to tell an unknown person's gender by looking at a picture, as mentioned above. More specifically, if I were to gender the people in the pictures, these decisions would have been arbitrary and based on my own personal prejudices, which would have been working against the purpose of this study. In order not to assign genders based on appearance, I based my interpretations on the names written below their portraits. Needless to say, a name is only a clue to a person's gender identity, but since I am unfamiliar with the people in the pictures, I consider their self-reported names to be the least arbitrary ground for my judgements.

Nine critical items, all descriptions denoting or connoting intelligence, were chosen based on the results in Bian *et al.* (2016) and Storage *et al.* (2016), and preliminary corpus searches in the COCA: *genius/geni*, *brilliant/brilliant*, *professor/professor*, *intelligent/intelligent*, *expert/expert*, *surgeon/kirurg*, *mastermind/hjärnan bakom*, *scientist/forskare*, *teacher/lärare*. and nine control items are accompanied by 20 fillers, to be found in Appendix 2. The control items are similar in length and style, in order not to give away the critical items: *professional/professionell*, *thorough/noggrann*, *interested in film/filmintresserad*, *a filmmaker/filmskapare*, *extreme/extrem*, *perceptive/uppmärksam*, *an accountant/revisor*, *a writer/författare*, and *interested in modern design/intresserad av modern design*. These items are intended to be overall positive and relatively gender-neutral qualities and professions and served to detect any general gender bias among the informants' responses.

### 3.2 The Corpus Study

In order to explore the linguistic environment in which the critical items above are used I conducted a small corpus study. The corpus used was the Corpus of Contemporary American

English (COCA) and it was chosen mainly for two reasons: first, the fact that this paper draws on recent American research on the topic, and, second, the informants who responded to the English version of the questionnaire being U.S. citizens. The COCA consists of 560 million words of text taken from various sources, like fiction, magazines and spoken, and spans between 1990 and 2017.

In order to investigate how frequently a given critical item occurs with reference to females or males, I had to manipulate the search condition in order to exclude entries where they did not function as an argument to which a predicate is assigned, as in (3) below.

(3) 

9	2016	FIC	Bk:GabrielsDaughters	A	B	C	the house.CHAPTER 2 # " I knew the cat was a smart cat, " she said in a high voice, " but I didn't know he was smart
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To tighten the link between the given pronoun and critical item, the copular verb *be (is)* was inserted after the pronoun in the corpus search, giving us search condition 1 (C1): *pronoun + is + critical item*. This would simulate the structure of the questions in my questionnaire, which take the form of *who-is-what* questions, e.g., (4).

(4) Who is interested in music?

According to my predictions, any possible gender bias would be found in the nominative pronoun of the answer, e.g. ‘*she* is interested in music.’ However, preliminary corpus searches suggest that there is valuable information not only in the number of hits for *pronoun + is + critical item*, but in cases where the description (e.g., *brilliant*) predicates another subject than the pronoun we are looking at. Hence, in order to retrieve some more qualitative data, I also used search condition 2 (C2), *pronoun + critical item*. The search conditions are illustrated in Table 1.

	<b>Pronoun</b>	<b>Copular Verb</b>	<b>Critical Item</b>	<b>Function</b>
<b>C1 (<i>she</i>)</b>	<i>she</i>	<i>is</i>	<i>brilliant</i>	Exclude entries in which the pronoun <i>she</i> is NOT predicated by the critical item/description
<b>C1 (<i>he</i>)</b>	<i>he</i>	<i>is</i>	<i>brilliant</i>	Exclude entries in which the pronoun <i>he</i> is NOT predicated by the critical item/description
<b>C2 (<i>she</i>)</b>	<i>she</i>	-	<i>brilliant</i>	Elicit the linguistic contexts in which <i>she</i> and <i>brilliant</i> co-occur

<b>C2 (he)</b>	<i>he</i>	-	<i>brilliant</i>	Elicit the linguistic contexts in which <i>she</i> and <i>brilliant</i> co-occur
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Table 1. Explanation of the structures and functions of the two search conditions used in the corpus study. The item ‘brilliant’ is used as an example.

I am aware that the forms of the questionnaires and the corpus study are rigidly binary. However, the fact that the informants were adults and not children demanded the pictures to be meticulously controlled and balanced for saliency to prevent informants to penetrate the purpose of my study. Therefore, I decided that it was wise to control the sets of pictures as much as possible, whereupon the great majority of people represented in the pictures are white, cis-people (a person whose gender identity is the same as their sex assigned at birth). Recall the claim made by Black & Coward (1981), that “*all* men do not control *all* women” (original emphasis), since there are numerous power relations intertwined at once (see also Mills, 2008, p. 83; Foucault, 1978). By controlling the pictures in the questionnaire in terms of skin color and dress, I hope that this will elicit choices based solely on the power relation of gender. In other words, I have tried what Mills (2008) claims to be impossible – to separate gender from race and class. However, since the subjects are forced to choose between ‘the powerful’ and the ‘less powerful,’ I believe that the results in this study may be applicable to other power relations as well.

## 4. Results

### 4.1 The Corpus Study

In this study, two search conditions were used, as shown in Table 1. First, however, a frequency ratio had to be established based on the number of times the masculine and the feminine pronouns occur in the corpus. In search condition 1, *pronoun + is*, the frequency ratio was 1:2.2 (female:male), as shown in Figure 1. However, the frequency ratio for the bare pronouns in search condition 2 are slightly less skewed, 1:1.94 (female:male). In other words, *he* is roughly twice as common as *she*, shown in Figure 2.

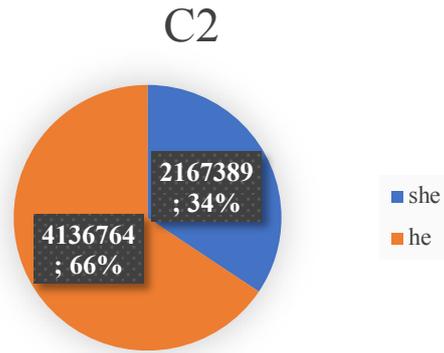
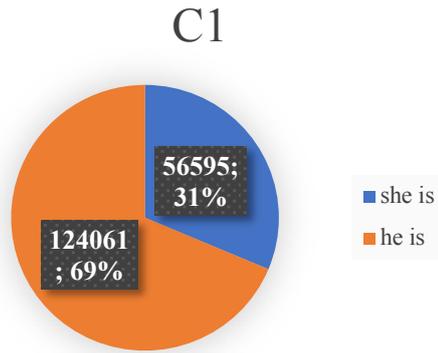


Figure 1. Raw frequencies of *she is* and *he is*.      Figure 2. Raw frequencies of *she* and *he*.

Since this corpus study focuses on stereotypes on gender and intelligence, the results had to be normalized in order to detect any bias outside the general male bias observed in the COCA.

Below are the results for *genius*. These results support the findings in Storage *et al.* (2016) that *genius* is more frequently used for men than women.

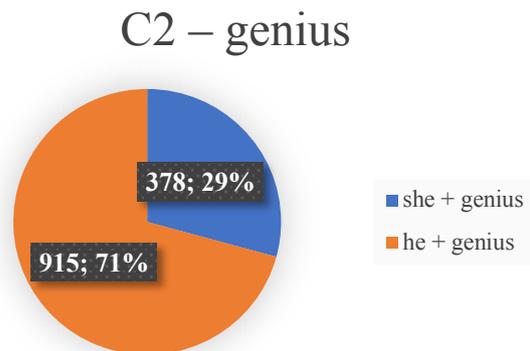
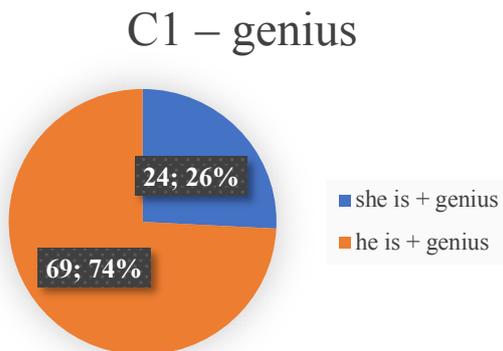


Figure 3. *Genius* in search condition 1. The results have been normalized.

Figure 4. *Genius* in search condition 2. The results have been normalized.

The results in C1 – *genius* show a slightly larger gender gap than in C2. In other words, *she* is assigned the description *genius* less often than *she* appears in its proximity. In C2 there were 16 entries (= 8 %) where the critical item did not refer to *she* but to another male, as in examples (5) - (11).

- (5) 11 | 2015 | MAG | People | A | B | C | their bohemian New York City tribe together. He's a creative **genius**, and **she's** a **genius** at managing his genius;
- (6) 23 | 2012 | FIC | Bk:HennyOnCouchNovel | A | B | C | , " I said. # " He's obviously a literary **genius**, " **she** whispered. The woman next to her glared at us.

- (7) 197 1990 ACAD AmerScholar A B C of the Widow Joyce, Nora began at last to believe in her husband's **genius**. " If **she** wasn't exactly merry, Nora was pleased to give her
- (8) 12 2015 FIC SewaneeRev A B C to get back to her family. **She**'s married to remember Bryant the **genius**? **She** has a great life. Her children are Marlene and Peter. Is
- (9) 135 2008 MAG Smithsonian A B C , the new research only heightens the artist's standing. " It reinforces his **genius**, " **she** says. " Homer has long been admired as a watercolorist capable
- (10) 61 2004 FIC Bk:Playmates A B C She knew he was turned on. Not that it made her a **genius**. **She** tucked her fingers into his hand, sliding a nail along his thumb in a
- (11) 165 1999 MAG Cosmopolitan A B C 's signature fellatio feat. " She didn't just give me oral sex, **she** gave me oral **genius**, " he raves. She'd put her thumb and

In (6), *she* is not the subject predicated by *genius*, and in (5), *she* is a genius, but only in relation to 'his genius,' a pattern that was not observed among the search results for *he* + *genius*. In close connection with C2 (*she*), there are also examples of explicit sexual content, as in (12) and (11), which did not occur in the results for C2 (*he*). In (7) and (8), the genius is the woman's husband, a structure which was not observed in the results for *he* + *genius*. The word *wife*, however, occurred twice, shown in (12) and (13).

- (12) 651 2002 SPOK CBS\_Morning A B C his second **wife**, Jacqueline, shot herself. (Vintage-footage-of) SAFER: (Voiceover) Of course **he** was a **genius** of an artist, but there was something beyond his
- (13) 48 2005 MAG PsychToday A B C had already published a book on the subject, Bring Up **Genius**, and **he** needed a **wife** willing to jump on board. Laszlo's grandiose plan impressed Klara

In the 198 (as many as the total results for *genius* + *she*) first entries for *genius* + *he* there were no examples of *genius* referring to a woman. It was used to refer to other men, but never a woman.

Now, let us turn to *brilliant*. The quantitative data in Figure 5 and 6 below may suggest that *brilliant* is more gender neutral than *genius*.

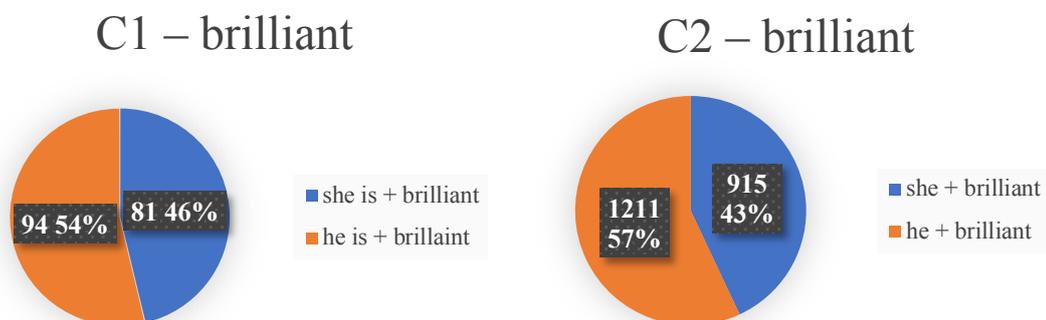


Figure 5. *Brilliant* in search condition 1. The results have been normalized.

Figure 6. *Brilliant* in search condition 2. The results have been normalized.

However, *brilliant* is not only used for denoting intelligence and skill but also as a modifier of colors/light and facial features. To explore the gender distribution of the latter usage, I searched

for the noun ‘smile’ among the C2 results. The noun phrase ‘brilliant smile’ appeared three times more frequently in the results for *she + brilliant* than *he + brilliant*.

Further, in C1 (*she*) one gets results like (14) - (16) which make references to clothes and sexual behavior.

- (14) 98 1990 FIC Bk:FourthK A B C until she smiled or laughed and then her sexuality flashed out brilliant as lightning. She was feminine without being flirtatious; she was strong without a
- (15) 12 2012 SPOK CNN\_Showbiz A B C penthouses, you really have to want to embrace. But, with Jessica, she is the most brilliant businesswoman. I mean, the clothes and the shoes and
- (16) 17 2009 SPOK NBC\_Today A B C the world. SCHIRRIPA: She's great, she's great. GIFFORD: She is brilliant. SCHIRRIPA: And she's a hooker. And my character...

As with *genius*, no references to men’s sexuality in relation to *brilliant* was found. In addition, no entries in C1 (*he*) explicitly mentions the antecedent’s appearance, except for this borderline case (17):

- (17) 85 1992 SPOK NPR\_ATC A B C : Isaacson: He was a man of enormous complexity and, indeed, he is brilliant and also very charming. Wertheimer: Do you think -- you've

In summary, it is difficult to investigate a possible gender bias for *brilliant*, since is used in different senses and contexts. However, the examples above suggest that in cases where *brilliant* collocates with *she*, sexuality and appearance is still not irrelevant.

*Mastermind* revealed the largest gender gap in favor of *he* of all the critical items. In C2, the search construction without the copular, only 16 % of the total number of entries were cases where *she* collocated with *mastermind*. Further, the gap is larger in C2 than in C1.

C1 – mastermind

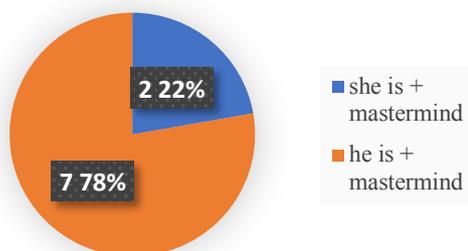


Figure 7. *Mastermind* in search condition 1. The results have been normalized.

C2 – mastermind

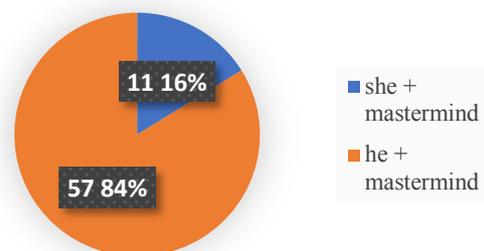


Figure 8. *Mastermind* in search condition 2. The results have been normalized.

The number of hits are low, so it is not possible to make any generalizations.

An item with more hits and a relatively small gender gap is *professor*. The results for search condition 1 and 2 are presented in Figure 9 and 10 below, showing a smaller gender gap in C1 than C2. Another item connoting academic brilliance is *scientist*, which, according to the COCA, is not a gender-neutral word. After normalizing the results, the word refers to *he* in 66% of the cases, as seen in Figure 11 and 12.

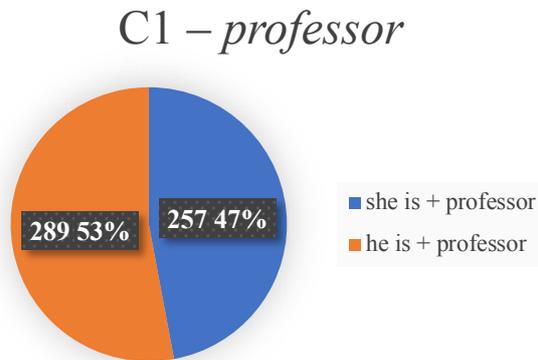


Figure 9. *Professor* in search condition 1. The results have been normalized.

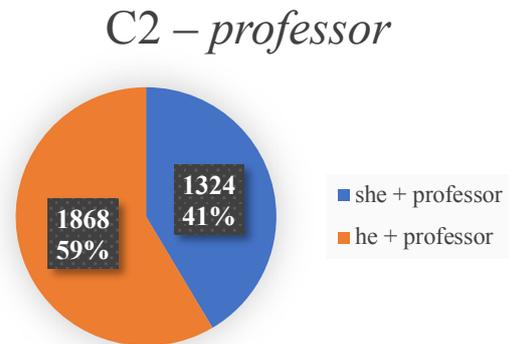


Figure 10. *Professor* in search condition 2. The results have been normalized.

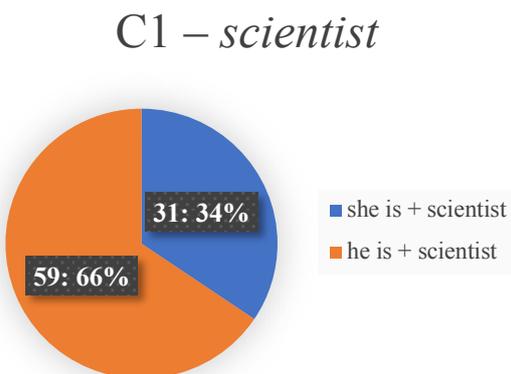


Figure 11. *Scientist* in search condition 1. The results have been normalized.

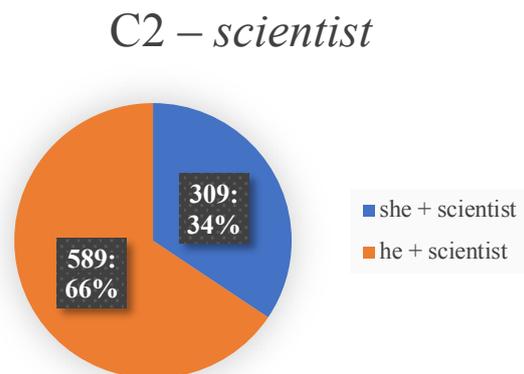


Figure 12. *Scientist* in search condition 2. The results have been normalized.

However, the gender gap is identical in both search conditions. This may suggest that among the results for *she + scientist* (C2 – *she*) the likelihood of the pronoun being the antecedent is larger than for items with larger gender gaps in the same search condition. All search results for C1 (*she*) are presented in Table 2 below.

CLICK FOR MORE CONTEXT				?	SAVE LIST	CHOOSE LIST	CREATE NEW LIST	?	SHOW DUPLICATES
1	2016	SPOK	PBS: PBS Newshour	A	B	C	science at the University of Alabama, right? She's a hard <b>scientist</b> . <b>She is</b> going to get a job in this new economy no matter what, right		
2	2016	SPOK	CNN: CNN Newsroom	A	B	C	could play a role in new treatments. Lucy Bruijn joins me from London. <b>She is</b> the chief <b>scientist</b> with the ALS Association. Lucy, thanks for being with		
3	2015	MAG	MotherJones	A	B	C	shoulders toned from flyfishing and bodybuilding. As several fellow researchers stress to me, <b>she is</b> the rare <b>scientist</b> who's also a powerful communicator. " I t		
4	2012	FIC	Analog	A	B	C	I only think I am in love. The comely girl who is so smart <b>she is</b> a rocket <b>scientist</b> , whom I wiU see as my true soul mate after		
5	2010	FIC	Scholastic	A	B	C	avatar that was made for Tom. N3: Grace is in the lab. <b>She is</b> the head <b>scientist</b> in charge of the avatars. Norm: Jake, meet		
6	2010	FIC	GoodHousekeeping	A	B	C	a wolf spider protecting its egg sac, tears trickle down her face. # <b>She is</b> a <b>scientist</b> ; she knows that part of what she's feeling is shock		
7	2009	FIC	IndiaCurrents	A	B	C	but she is also an extremely good soccer player. And did you know, <b>she is</b> a <b>scientist</b> too? " " Yes I know, Ach!! " the		
8	2006	SPOK	NBC_Today	A	B	C	kind of a double life; by day she is a <b>scientist</b> , at night <b>she is</b> a roller derby vixen. We're going to be finding out a little		
9	2006	SPOK	NBC_Today	A	B	C	coming up. Also, she leads kind of a double life; by day <b>she is</b> a <b>scientist</b> , at night she is a roller derby vixen. We're		
10	2002	MAG	TotalHealth	A	B	C	analytical geochemist and an expert in the design and operation of chemical research laboratories. <b>She is</b> a research <b>scientist</b> at the u.s. Department of Agricul		
11	2000	NEWS	AssocPress	A	B	C	university professor, no museum curator. She isn't even a <b>scientist</b> . # <b>She is</b> a high school dropout, a self-taught maverick, a real-life Indiana Jones who		
12	1999	FIC	ParisRev	A	B	C	in Maryland, New York is like the duplicitous invention of a mad <b>scientist</b> . <b>She is</b> impressed by the contrast of life and death, wealth and poverty, sickness		
13	1994	NEWS	WashPost	A	B	C	list of 20 " movers and shakers " of the " New West, " <b>she is</b> actually a <b>scientist</b> by training. As naturalist in residence at the Utah Museum		
14	1990	NEWS	NYTimes	A	B	C	. " Margaret Joan Geller, 42, professor of astronomy at Harvard University. <b>She is</b> a senior <b>scientist</b> at the Smithsonian Institution. Jorie Graham, 39, poet		

Table 2. All results (14) for *she is + scientist*.

Further, in contrast to *smart* or *brilliant*, the results in Figure 14 might suggest that comments on women’s appearance in the proximity of *scientist* are less frequent. Notable is the use of ‘vixen,’ a synonym for ‘shrew.’

Another item with identical gender gaps in both C1 and C2 is *expert*, which shows a small male bias. The results of the two search conditions are presented in Figure 15 and 16 below.



Figure 13. *Expert* in search condition 1. The results have been normalized.

Figure 14. *Expert* in search condition 2. The results have been normalized.

The words modifying the head *expert* also reveal certain gender roles. In the entries (18) - (20) below, retrieved from the COCA, the item *expert* with the antecedent *she* is modified by “style,” “parenting,” and “at body manipulation.” These words modified none of the cases where *expert* collocated with *he is* (C1).

(18)	3	2016	SPOK	NBC: Today Show	A	B	C	for your trip. NATALIE-MORALES# Right. TODAY contributor and style <b>expert</b> Lilliana Vasquez. <b>She is</b> here with some fun looks and some gorgeous models
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- (19) 

11	2010	SPOK	CBS_Early	A	B	C	tips on how to stay calm while chaos reigns is parenting expert Shannon Eis. She is a contributor to Time to Play magazine. And our good friend. Good
----	------	------	-----------	---	---	---	---
- (20) 

26	1996	FIC	MovJerryMaguire	A	B	C	sound. She then walks over, taking his shoulders and bending them forward. She is an expert at body manipulation, loosening him as she talks.
----	------	-----	-----------------	---	---	---	---

In the results for C1 (*he*), there was one modifier with sexual connotations, presented in (21), which is retrieved from a work of fiction and uttered in jest:

- (21) 

61	2001	FIC	Bk:DarknessMoreThan	A	B	C	a lot of things but there has been no proffer made to the court that he is an expert in human sex-uality. " There was a murmur of quiet laughter
----	------	-----	---------------------	---	---	---	--

In contrast, I would argue that the entries below, where *expert* is backgrounded by academic merits, is more representative of the results for *he* + *expert* (C2).

- (22) 

3	2017	SPOK	CNN: CNN's Amanpour	A	B	C	the Study of Radicalization and Political Violence at King's College here in London. He is an expert on terror and online radicalization. Peter, we'll t
---	------	------	---------------------	---	---	---	--

Finally, as with *scientist*, the identical gender gaps in C1 and C2 might suggest that the given pronoun is more likely to also be the antecedent in C2.

Now, let us turn to *surgeon*. In C1, the gender distribution is 50/50 after normalizing the results. However, the number of hits in this condition is low. In C2, a slight male bias can be discerned. The results are presented in figure 15 and 16.

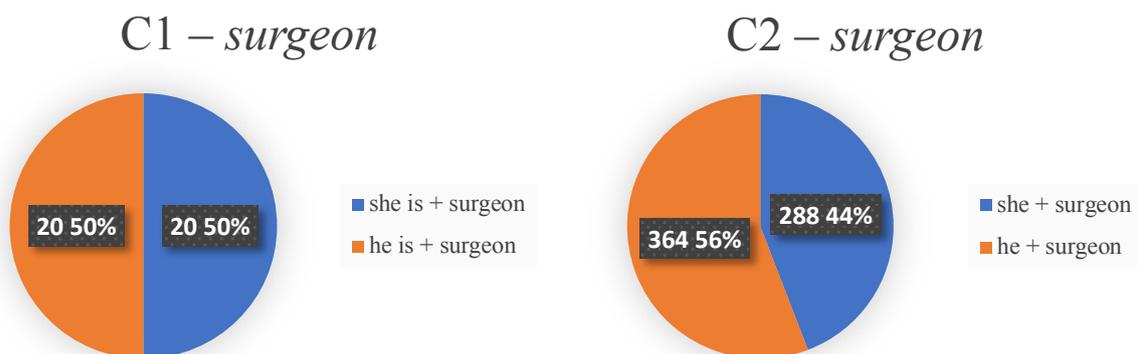


Figure 15. *Surgeon* in search condition 1. The results have been normalized.

Figure 16. *Surgeon* in search condition 2. The results have been normalized.

In the entry below, *surgeon* is modified by the word ‘fabulous,’ a word that did not occur in the results for C2 (*he*).

(23) 

124	2003	NEWS	SanFranChron	A	B	C	breast bone and against the rib cage. It wasn't working. # "She's a fabulous surgeon, but she doesn't do thoracic surgery. That's
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We are now moving on to the three items displaying a female bias. The largest gender gap in favor of *she* was observed for *teacher*, as seen in Figure 17 and 18.

C1 – *teacher*

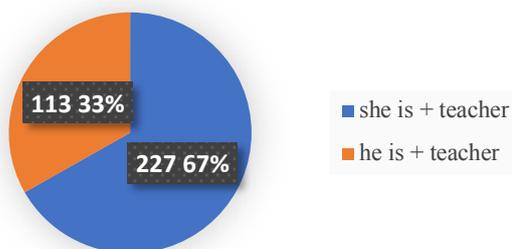


Figure 17. *Teacher* in search condition 1. The results have been normalized.

C2 – *teacher*

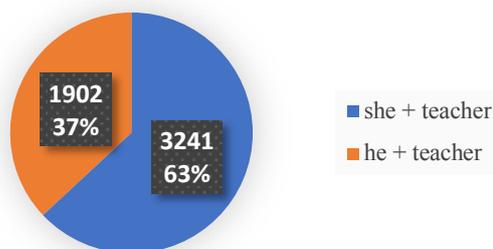


Figure 18. *Teacher* in search condition 2. The results have been normalized.

When looking at the qualitative data in C2 (*he*), there are no sexual references. In C2 (*she*), however, there are recent cases like (24). In (25), we find clothing references.

(24) 

4	2016	FIC	Bk:SecondSkin	A	B	C	in his office after class or carries a boy to his teacher's bed where she touches his hairless chest. It's a dance in which teacher and student anticipate
---	------	-----	---------------	---	---	---	--

(25) 

8	2016	NEWS	Omaha World-Herald	A	B	C	to the research by Walden University in Minnesota. # Gretna teacher Jennifer Plowcha said she prepares her wardrobe a week in advance to make cert
---	------	------	--------------------	---	---	---	--

Two items that deviates from the general pattern that the gender gap is larger in C2 than C1 are *intelligent* and *smart*. Both these items monitor a female bias in C1 but not in C2, as shown in Figures 21-24 below.

C1 – *intelligent*

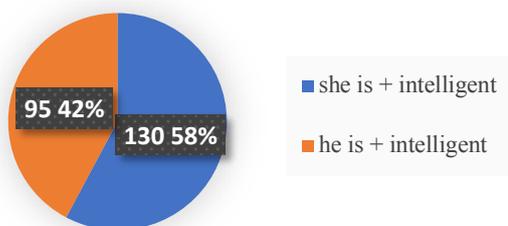


Figure 19. *Intelligent* in search condition 1. The results have been normalized.

C2 – *intelligent*

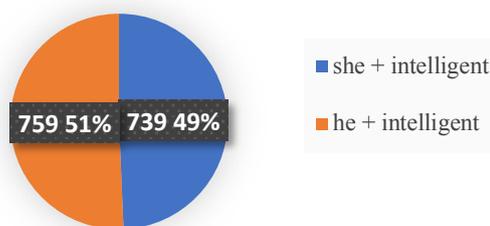


Figure 20. *Intelligent* in search condition 2. The results have been normalized.

## C1 – smart

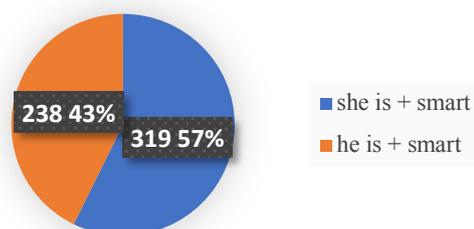


Figure 21. *Smart* in search condition 1. The results have been normalized.

## C2 – smart

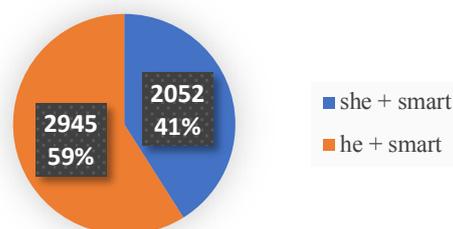


Figure 22. *Smart* in search condition 2. The results have been normalized.

*Smart* sometimes refers to describe how a person dresses, as in (26) and (27).

- (26) 91 2003 FIC Macleans A B C her stylish chinoiserie coat with the lynx-trimmed hood, looking extremely smart as well. She was not only dressed suitably, but the provenance of the r
- (27) 24 2013 MAG People A B C Sherlock and Joan dress in ways that reflect their personalities. He dresses smart. She is chic but functional. # REBECCA HOFHERR # GIFTS FOR HIM #

However, the qualitative data in C1 suggest that *she is smart* often collocates with words like ‘sexy’ and ‘attractive.’ This could explain the female bias observed in C1 but not in C2. Consider the examples below (28) - (35):

- (28) 18 2015 MAG Newsweek A B C not be used in this article), a 34-year-old marketing executive in Shanghai: She is smart, engaging, hip and attractive. She is also the divorced mother
- (29) 43 2009 FIC Bk:FatChance A B C an event planning business with her partner, Jean-Claude. She's as smart as she is beautiful. There's something exotic about her features that makes mer
- (30) 46 2008 FIC Analog A B C . " Pamela had the world by the ass, " Roderick continued. " She is smart and beautiful. A business associate of mine was prepared to offer her
- (31) 55 2006 FIC Bk:WhatGoesAround A B C their happiness and your peace of mind? " This woman is as smart as she is sexy. Terry smiled. He had to admit her plan did seem without
- (32) 56 2006 MAG AmSpect A B C talking to. She's from Montgomery County, Maryland, like moi. # She is smart, great looking, and super polite. The group she heads was
- (33) 76 2000 NEWS NYTimes A B C Farrelly use her as man's dreamy hallucination of every girl who got away; she is smart, sexy, professionally accomplished (an orthopedic surgeon), loves
- (34) 77 2000 NEWS WashPost A B C eventually start offering data-transmission services, he said. 39185 # She is smart. She is well educated. She is successful and not unattractive. .
- (35) 96 1992 MAG Ebony A B C she had no other choice but " to be strong for my son, " she is smart enough to recognize her motherly protectiveness for what it is: an escape

In C1 (*he*), ‘sexy’ appeared once, in (36), although not in the same sentence as *smart*. The words ‘attractive’ and ‘beautiful’ did not appear at all. Other descriptions collocating with *he is smart* are shown in (36) - (45).

- (36) 211 2009 MAG Cosmopolitan A B C WORDS OF THE FRIEND WHO NOMINATED HIM: "Johnny is sexy and confident. He is also very smart and has great style -- a real catch. " HIS
- (37) 4 2017 SPOK ABC: 20/20 A B C charismatic in the sense of you don't cross him. He is powerful, he is smart, and if you do cross him, you're not only gon
- (38) 27 2014 MAG NatlReview A B C are in awe of Gonzalez Leiva, and it's easy to see why: He is smart, articulate, personable, resolute, and compelling. We are sitting
- (40) 92 1994 SPOK PBS\_Newshour A B C his success is he works hard, he is shrewd, he's smart, he is tough, and he's possessed of enormous self-confidence. He really is.
- (41) 141 2006 NEWS Atlanta A B C . He is a good worker. He keeps everybody in my family safe. He is smart, brave, strong, confident and honest. That is why my
- (42) 156 2003 NEWS CSMonitor A B C their baby, their health, their abilities. And she reminded her husband that he is smart, confident, capable. # "Sitting home and being mean to
- (43) 164 2001 SPOK NPR\_Morning A B C new US Trade representative. I've known Bob for many, many years. He is extremely smart, creative, very energetic and I think he'll do a
- (44) 173 1999 MAG SportingNews A B C a lot more like Manning than Leaf in several areas, especially the intangibles. He is smart, loves the game, studies videotape and appears to be mature,
- (45) 234 1994 MAG RollingStone A B C Brad Pitt is a cagey bastard - a good ol' boy with brains. He is slippery, smart and extremely likable. These are qualities he uses to great

These examples support the claim that *smart* more often co-occur with descriptions of appearance when predicating the pronoun *she*.

In (46), *smart* is being repeated four times. Repeating a word in the same or neighboring clauses may result in the conversational implicature “as opposed to X,” where X in this case is ‘dumb.’ This analysis is supported by (47), where the implicature is explicitly stated:

- (46) 10 2016 SPOK ABC: The View A B C you got the questions right because you're a smart, smart woman. She is smart. She's a very smart woman. Yeah, I believe you
- (47) 232 1995 SPOK CBS\_48Hours A B C from one point to another in my career, like Arnold Schwarzenegger used bodybuilding. He is a very smart man, and I'm not dumb either.

In summary, the gender gaps were slightly smaller in C1 than C2, except *genius*, which had a stronger male bias in C1 than in C2, and *expert* and *scientist* which showed identical gender gaps in the two conditions. *Intelligent* and *smart* showed a female bias in C1 but not in C2. *Teacher* was the only item that appeared to have a female bias in both C1 and C2. The remaining items showed a male bias in both search conditions: *genius*, *brilliant*, *professor*, *expert*, *mastermind*, and *scientist*. These results will be further discussed in section 5.

## 4.2 The Questionnaires

Two different versions of the questionnaire were compiled, one in Swedish and one in English. A total of 79 persons responded, 48 for the Swedish version and 31 for the U.S. version. In section 4.2.1, the U.S. data will be presented, and the Swedish data in section 4.2.2.

### 4.2.1 The U.S. Questionnaire

31 persons participated in the U.S. study. Three participants were excluded since they did not fit the age span investigated in this paper, 20-35 years, and two participants were excluded since they were not U.S. citizens. Consequently, 26 responses were analyzed. The age and gender distribution of these informants are shown in Table 3.

Age/Gender	Female	Male	Non-binary	Total
<b>20-23</b>	2	1	-	3
<b>24-27</b>	3	6	-	9
<b>28-31</b>	3	5	1	11
<b>32-35</b>	2	2	1	4
<b>TOTAL</b>	<b>10</b>	<b>14</b>	<b>2</b>	<b>26</b>

Table 3. The age and gender distribution of the U.S. informants.

Most informants were male, 57%. 36% were women, and 7% were non-binary. The largest age group was 28-31 years. 85% were under 32, which means that the average age of the U.S. sample was slightly lower than the Swedish. Four persons (14%) stated that they were presently studying at a university.

Now, let us turn to the results for the descriptions of intelligence, our critical items. In figure 23 below, all 26 responses that were analyzed are shown. The gender distinctions refer to the pictures in the questionnaire.

### Critical items – U.S. Responses

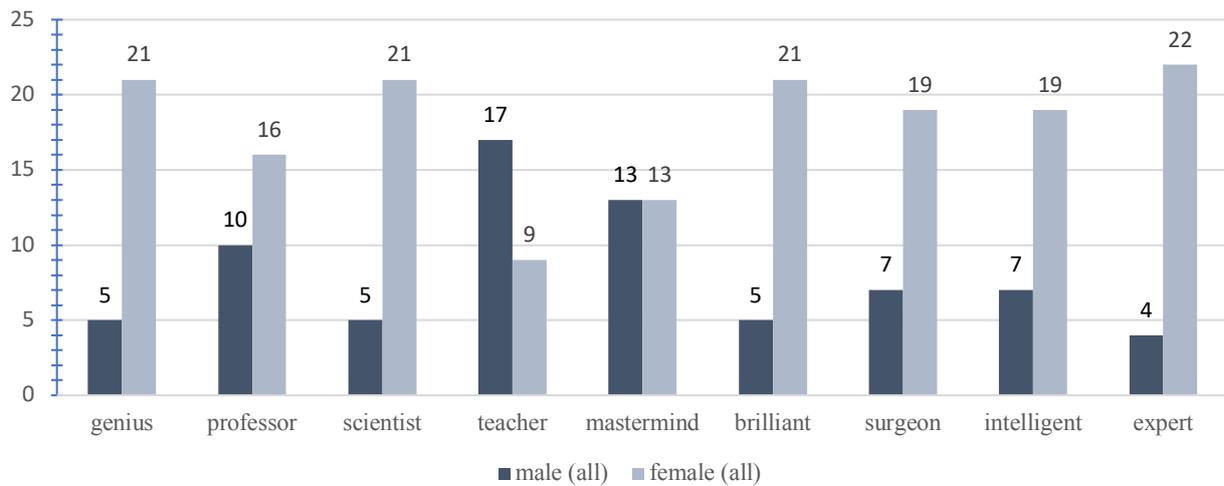


Figure 23. All U.S. responses are shown here irrespective of gender.

The critical items show a clear female bias – the informants chose 69 % females (161/234=0.69) and 31 % males. The items with the largest gender gap are *genius*, *brilliant*, and *expert* – 1:4.2 (male:female). For *teacher*, on the other hand, most informants chose a picture of a man. The only item that appeared to be gender-neutral was *mastermind*.

Presented in Table 4 below are the gender distribution of the U.S. responses for the critical items. The gender distinctions are based on the gender identities self-reported by the informants in Part 1 of the questionnaire.

Responses / Gender of Participant	Female	Male	Other
Pictures of women	68% (61)	65% (88)	78% (14)
Pictures of men	32% (29)	35% (47)	22% (4)

Table 4. Distribution of answers (critical items) in relation to the informants' self-reported genders.

Male informants were more inclined than the females and non-binaries to choose females over men for *genius*, *professor*, *scientist*, *surgeon*, and *intelligent*. However, the most extreme examples *teacher* and *mastermind* diluted the results, resulting in males choosing 65 % females for the critical items compared with the female informants choosing women 68 % of the time.

Four informants, all of them male, were presently studying at a university. These four informants chose females for all the critical items except *mastermind*, where females received 75% of the votes, and *teacher* where males received 100 % of the votes.

In Figure 25 below, the U.S. results for the control items are shown.

## Control Items – U.S. Responses

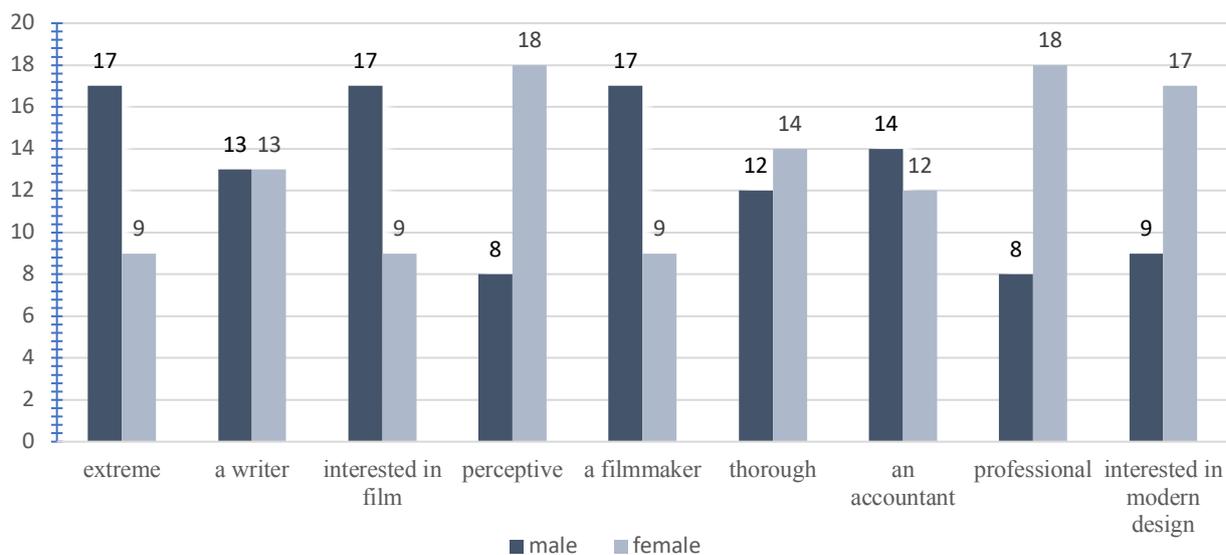


Figure 25. All analyzed American responses (N=26).

Compared to the critical items, the control items show more variation. Only three items – *a writer*, *thorough*, and *an accountant* – show no or a small gender gap. The other items revealed a gender gap mean of 33% ( $52/156=0.24$ ) suggesting that these descriptions are not gender neutral. However, as opposed to the critical items, the control items showed a considerably smaller gender gap, 51/49% ( $119/234=0.51$ ), in favor of the females. The fillers, which also consisted of image sets of two women and two men, were analyzed too, in order to further explore if there was indeed a general tendency to choose women over men. Nevertheless, the gender distribution for the fillers is 48/52% in favor of pictures of males, which suggests that the critical items stand out, with a gender distribution 69/31% (female:male).

### 4.2.2 The Swedish Questionnaire

48 people participated in the Swedish questionnaire. One person was excluded, since Swedish was not their native language, and three other informants were excluded as they did not fit the age span investigated in this study. Consequently, the number of responses represented in these results is 44. The age and gender distribution among the Swedish informants is shown below, in Table 5.

Age/Gender	Female	Male	Other	Total
20-23 years	-	-	-	-
24-27 years	7	7	-	14
28-31 years	5	12	2	20
32-35 years	5	5	1	11
<b>TOTAL</b>	<b>17</b>	<b>24</b>	<b>3</b>	<b>44</b>

Table 5. Age and gender distribution among the Swedish informants.

The Swedish sample was older than the U.S. No informants were found in the age group 20-23 years. Males between 28-31 years old constituted the largest group (27 %) in the Swedish sample. Among the Swedish informants, eleven persons (25 %) stated that they were presently studying at a university. The same number was for the American questionnaire 14.8 %.

The results for the critical items in the Swedish questionnaire are shown below.

### Critical Items – All Swedish Responses

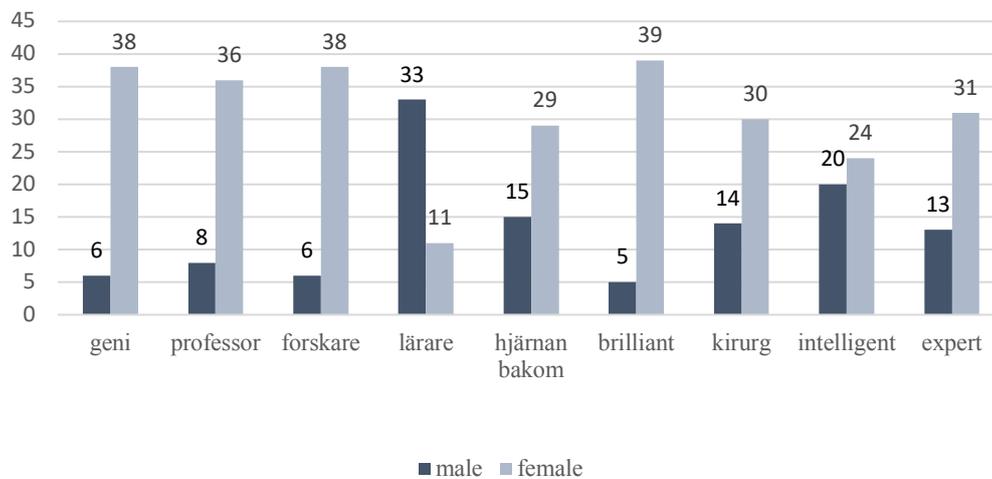


Figure 26. All analyzed responses (N=44) in the Swedish study.

As in the U.S. study, the intelligence-based descriptions were more often assigned to females than men. The items which showed the largest gender gaps were *geni* (1:6.3, male:female), *forskare* (1:6.3, male:female) and *brilliant* (1:7.8, male:female). The item with the largest gender gap (3:1, male: female) in favor of males was *lärare* 'teacher.' The most gender-neutral item appeared to be *intelligent*.

Below are the results for the Swedish control items.

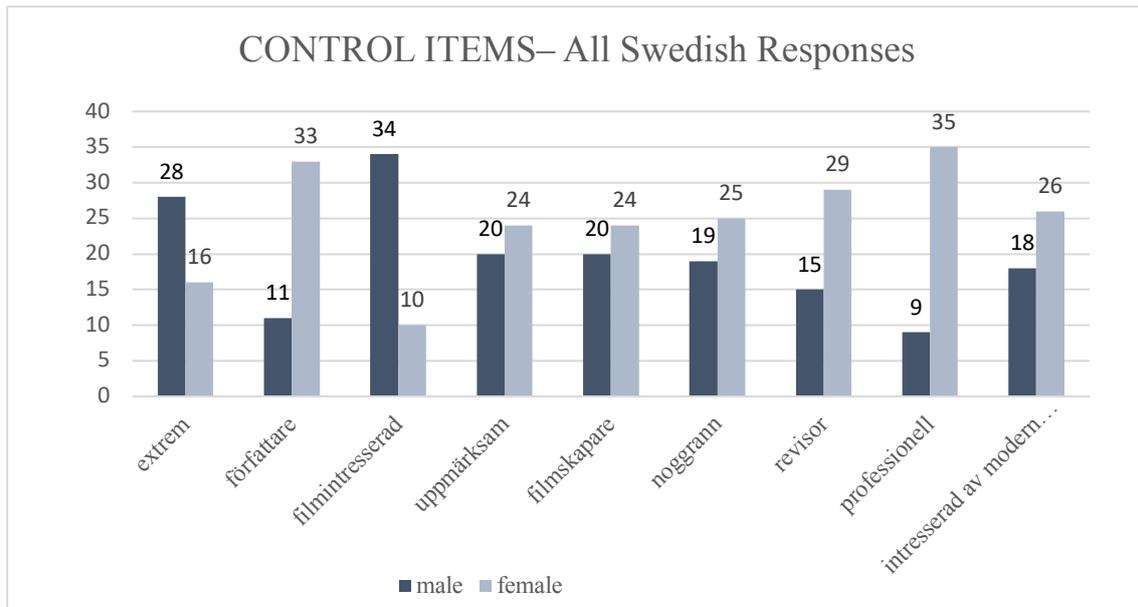


Figure 27. The results for the control items in the Swedish questionnaire.

As was the case with the American control items, the Swedish responses showed more variety. The gender distribution was 56/44% in favor of pictures of females, which is slightly more than for the U.S. control items. The gender distribution of the fillers was 52/48 % (female/male).

In Table 6, the gender distribution for the critical items is presented.

Responses / Gender of Participant	Female	Male	Other
<b>Pictures of women</b>	All: 52% (57%)	70% (55%)	56% (56%)
<b>Pictures of men</b>	All: 48% (43%)	30% (45%)	44% (44%)

Table 6. The gender distribution of responses for the critical items in the Swedish study. Control items within parentheses.

These results strongly suggest that the female bias observed for the critical items is due to the responses of the male informants. Females and non-binaries were not more likely to choose images of women when the description denoted intelligence, than they were for the control items and fillers. In fact, they were less inclined to choosing pictures of women.

In Table 7, the results for the questionnaires are summarized. As opposed to the initial predictions, the critical items show a female bias in both studies, while the control items and fillers are more gender-neutral.

	<b>Males</b>	<b>Females</b>
<b>Swedish Critical Items</b>	<b>33%</b>	<b>67%</b>
<b>U.S. Critical Items</b>	<b>31%</b>	<b>69%</b>
<b>Swedish Control Items</b>	44%	56%
<b>U.S. Control Items</b>	49%	51%
<b>Swedish Fillers</b>	48%	52%
<b>U.S. Fillers</b>	52%	48%

*Table 7. Results for the critical items, control items and fillers. All answers.*

In this section, the results were presented, and it became evident that the corpus study results and the results from the questionnaires pointed in different directions. While the intelligence descriptions showed a male biased in the corpus study, the results from the questionnaires did not. Yet, although the descriptions of intelligence show no male bias, my results strongly suggest that they are not gender-neutral. In the next section we will discuss possible reasons for this.

## 5. Discussion

The purpose of this study was to investigate to what extent the “brilliance = male trait” stereotype is activated when Swedish and U.S. citizens are presented to descriptions that denote/connote intelligence. To answer this question, a corpus study was conducted and two questionnaires, one in Swedish and one in English, were filled in by Swedish and U.S. citizens aged 20-35.

We begin by discussing the corpus study results, in section 5.1, as they helped the process of choosing the critical items for the questionnaires. In section 5.2, we will turn to discussing the questionnaires.

### 5.1 The Corpus Study

The Corpus of Contemporary American English (COCA) covers the years 1990-2017, so the examples are relatively new. According to COCA, the corpus contains more than 550 million words taken from spoken, fiction, popular magazines, newspapers, and academic texts. These sources, I would argue, constitute a base for western collective consciousness and the fact that the masculine subject pronoun occurs roughly twice as often as the feminine indicates a larger male presence on this podium. Moreover, another factor that is likely to have contributed to the

male scores being so high is the use of generic *he*, which, according to Bodine (1975) and Lakoff (1975), is not generic at all, but a reflection of the androcentric world view.

The overall results suggest that semantically strong descriptions that signal an innate ability, like *genius* and *mastermind*, carry the largest male bias. *Scientist*, displayed the third largest male bias. Acquirable titles, like *professor*, *surgeon*, and *expert*, displayed the smallest gender gap while *teacher*, *intelligent*, and *smart* were the least male biased items. In addition, *brilliant* did not appear as male biased as predicted. In Storage et. al.'s study (2016), *genius* and *brilliant* were both used to measure student's attitudes on the intelligence. For this reason, I was expecting to observe a similar gender gap in these two items. Yet, one possible reason why the sizes of the gender gaps are smaller in *brilliant* is that the word is not only used to predicate intelligence, but also to modify colors, smiles, eyes, lights, etc. This could explain the high number of hits for *she + brilliant* (C2), since the results presented in section 4.1. suggest that women's looks are commented on more often than men's in relation to the critical items. More specifically, this could serve as an explanation as to why the gender gap is smaller in *brilliant* than in *genius*. Moreover, the corpus results serve as a possible indication that when talking about extreme intelligence and the subject is a female, looks and appearance are still variables taken into account. This is problematic since, as the results in Storage et al. (2016) suggest, it may leave women, transgender people, and non-binaries hesitant about choosing careers that are believed to require an innate ability as they may face the threat of their work being judged on a different basis than their male peers'.

Two cases revealed different biases in the two search conditions – both *intelligent* and *smart* showed a female bias in C1, where the link between pronoun and critical item is 'tightened' by a copular verb, but not in C2 – with no copular verb – where the pronoun may not be predicated by the critical item, but only appearing in its proximity. The female bias in C1 (*smart*) could suggest that the phrase *she is smart* is produced more often than *he is smart*. *Genius*, on the other hand, had a larger gender gap in C1 than C2, which points at the other direction – that *he is (a) genius* is more colloquial than *she is (a) genius*. It may be the case that it is more common to explicitly comment on the intelligence of a woman than a man using words that does not carry downward entailment, as in the Hornian system (Horn, 1989). To illustrate, "she is smart" does not entail "she is a genius," while "she is a genius" entails "she is smart." *Smart* is, then, lower ranked than *genius*. The same analysis could be applied on *professor* and *teacher* where *professor* entails *teacher* but not vice versa and is therefore semantically stronger in this sense. Again, the semantically stronger *professor* displays a minor male bias (C1: 53 %; C2: 59 %), and the 'semantically weaker' *teacher* has a female bias in

both C1 (67 %) and C2 (62 %). For this reason, I would argue that the “intelligence = male trait” stereotype could be hidden even in the female bias of *she is smart, she is intelligent* and *teacher* (both C1 and C2).

*Expert* and *scientist* were the only items to display identical gender gaps in C1 and C2. These items are, as opposed to *genius, smart, and brilliant*, not typically used as exclamations or modifiers but as heads of noun phrases. This ‘uncreative’ usage may explain why the size of the gender gaps does not change in C2, where no copular ties the critical item to *she* or *he*.

In summary, the critical items that are vague but semantically strong, e.g., *genius, mastermind* and *scientist*, tend to have a larger male bias than the critical items that are semantically weaker, e.g., *smart* and *intelligent*. Further, all items except *mastermind* and *scientist* show tendencies of occurring together with reference to the predicated pronoun’s sexuality or appearance, especially when the predicated pronoun is *she*.

## 5.2 The Swedish and the U.S. Questionnaires in Comparison

The purpose of this study was to investigate attitudes towards gender and predicates denoting or connoting intelligence among Swedish and U.S. citizens between 20 and 35 years. In this section, I will compare and discuss the results from the two questionnaires.

As mentioned in section 4, the results from the questionnaires strongly go against my predictions based on the results in Bian *et al.* (2016) and the corpus study. However, a female bias suggests that the critical items are not gender-neutral. To illustrate, a five-year-old girl in Bian *et al.*’s study, still unaware this stereotype, may find it strange if an adult unprompted told her that “women *can* be astronauts,” since that would signal a contrast she is not yet aware of. The adult in this hypothetical situation is actively trying to ‘undo’ a gender stereotype but is in fact maintaining it.

The general tendencies for the Swedish and North American studies are similar – the descriptions of intelligence, that is, the critical items, showed a clear female bias, around 70%. The control items and fillers, on the other hand, were close to being gender-neutral. The group most likely to assign descriptions of intelligence to women were Swedish men while Swedish women and non-binaries were least inclined to do the same. As opposed to the adult in our hypothetical situation asserting that women can become astronauts, it may be the case that Swedish women and non-binaries are *passively* trying to undo this stereotype.

The gender distribution of the North American results, however, was more unison. The male informants showed a clear tendency to choose women for the critical items. As opposed

to the Swedish study, however, the responses of females and non-binaries showed an even larger female bias. This might suggest that they are working against the stereotype *actively*. What emerges is a pattern where the U.S. informants and the Swedish male informants choose roughly 70% women for the critical items, while the corresponding number for Swedish female and non-binary informants is 53%.

Another aspect that may have caused this tendency of choosing the photos of women is the fact that real photos were used in the study. One person in the *genius* set was chosen by so many informants that I consulted people outside the study to examine if her appearance simply overrode the possibility of a choice made on the basis of gender. I have no evidence that this was not the case. Therefore, I cannot make any generalizations. In addition, I am aware that online surveys face a risk of self-selection bias, which refers to a difference between the population that participates in the study, and the population that chooses not to (Randall, 2011). Further, it is possible that some informants' initial reactions were to choose a male, but awareness of what is considered 'politically correct' may have triggered what is known as Socially Desirable Responding (Bryman, 2008). The participants' tendency to choose women for the predicates of intelligence, which carry strong positive connotations, may also have been triggered by the recent #metoo movement that began in October 2017, when it was revealed that several powerful Hollywood profiles had been guilty of sexual misconduct over decades. I would argue that the #metoo movement has strengthened the general expectation on people to stand up against sexism. In addition, given that the movement began in the U.S. and grew strong in Sweden too, it is likely to have had an effect on the informants in this study. It is however possible that the results of this study suggest an ongoing change in Swedish and U.S. citizens' attitudes towards gender and intelligence.

## 6. Conclusion

The aim of this paper was to investigate if predicates denoting extreme intelligence have a male bias among Swedish and U.S. citizens between 20-35 years. To answer this question, I first conducted a small corpus study in COCA, which helped me explore the frequency, and linguistic environments of nine given items: *genius*, *professor*, *scientist*, *teacher*, *mastermind*, *brilliant*, *intelligent*, and *expert*. After that, two questionnaires were compiled, one in Swedish and one in English, and distributed through social media. 79 persons participated in the study,

but nine of these were excluded. Consequently, 70 responses were analyzed, and the results were presented and discussed.

The results of the questionnaires did not support the claim that words of intelligence have a male bias. However, a strong female bias could be observed, which suggest that the critical items are not gender-neutral. Several possible explanations for this have been presented, e.g., self-selection bias and socially desirable responding as well as the photo sets in the questionnaires enabling choices based on other grounds but gender. Further, due to the small sample size, it is not possible to make generalizations. On the other hand, I cannot exclude the possibility that these results can hold as an indication that attitudes towards women's intelligence are changing.

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## Appendix 1 – The Questionnaire in English

### Part 1:

About you:

1. Age:                    20-23  
                                 24-27  
                                 28-31  
                                 32-35  
                                 Other
2. Are you an American citizen? (Yes/No)
3. Are you presently studying at a University? (Yes/No)
4. What is your highest level of education? (University or Collage/High School/Middle School)
5. Gender identity? \_\_\_\_\_
6. Is English your native language? (Yes/No)

*Anyone who answered 'No' was excluded from the test.*

### Part 2:

- (1) Who is interested in music?
- (2) Who is extreme?
- (3) Who is a good friend?
- (4) Who is a writer?
- (5) Who is interested in film?
- (6) Who is reliable?
- (7) Who is a scatterbrain?
- (8) Who is a genius?
- (9) Who is always hungry?
- (10) Who is a morning person?
- (11) Who is an expert?
- (12) Who is wonderful?
- (13) Who is funny?

- (14) Who is always on a diet?
- (15) Who is a vegan?
- (16) Who is a professor?
- (17) Who is always tired?
- (18) Who is self-conscious?
- (19) Who is lonely?
- (20) Who is always late?
- (21) Who is perceptive?
- (22) Who is a scientist?
- (23) Who is a fan of broccoli?
- (24) Who is bossy?
- (25) Who is a teacher?
- (26) Who is a filmmaker?
- (27) Who is a mastermind?
- (28) Who is thorough?
- (29) Who is always whining?
- (30) Who is a drunk?
- (31) Who is brilliant?
- (32) Who is a daydreamer?
- (33) Who is an accountant?
- (34) Who is a musician?
- (35) Who is a surgeon?
- (36) Who is a professional?
- (37) Who is intelligent?
- (38) Who is interested in modern design?
- (39) Who is amazing?

## Appendix 2 – The Questionnaire in Swedish

Del 1:

Om dig själv:

7. Ålder:                    20-23  
                                  24-27  
                                  28-31  
                                  32-35  
                                  Annan

8. Nationalitet? \_\_\_\_\_

9. Studerar du för närvarande vid ett universitet eller högskola? (Ja/Nej)

10. Vad är den högsta utbildningen du har genomfört? (Grundskola/Gymnasiet/En eller flera kurser på universitet eller högskola/Examen från universitet eller högskola)

11. Könsidentitet? \_\_\_\_\_

12. Är svenska ditt modersmål? (Ja/Nej)

*Anyone who answered 'nej' was excluded from the test.*

Del 2:

- (1) Vem är musikintresserad?
- (2) Vem är extrem?
- (3) Vem är en bra vän?
- (4) Vem är författare?
- (5) Vem är filmintresserad?
- (6) Vem är pålitlig?
- (7) Vem är en virrpanna?
- (8) Vem är ett geni?
- (9) Vem är alltid hungrig?
- (10) Vem är en morgonmänniska?
- (11) Vem är en expert?
- (12) Vem är underbar?
- (13) Vem är rolig?

- (14) Vem går alltid på diet?
- (15) Vem är vegan?
- (16) Vem är en professor?
- (17) Vem är alltid trött?
- (18) Vem är självmedveten?
- (19) Vem är ensam?
- (20) Vem är alltid sen?
- (21) Vem är uppmärksam?
- (22) Vem är en forskare?
- (23) Vem är ett fan av broccoli?
- (24) Vem är bossig?
- (25) Vem är en lärare?
- (26) Vem är filmskapare?
- (27) Vem är hjärnan bakom?
- (28) Vem är noggrann?
- (29) Vem är alltid grinig?
- (30) Vem är ett fylllo?
- (31) Vem är brilliant?
- (32) Vem är en dagdrömmare?
- (33) Vem är revisor?
- (34) Vem är en musiker?
- (35) Vem är en kirurg?
- (36) Vem är professionell?
- (37) Vem är intelligent?
- (38) Vem är intresserad av modern design?
- (39) Vem är underbar?