

From Where She Stands: Standpoint Theory as a Significant Predictor of Diversity in Academia

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Abstract

Certain academic fields are less diverse along gender and racial lines than others. Work on stereotypes has shown that negative stereotypes about lack of innate intellectual ability may contribute to the underrepresentation of women and African Americans in academia, from the level of the bachelor's degree and up. The purpose of the present study is to add a dimension to this discussion that has not previously been explored. Drawing on concepts within standpoint theory, this paper aims to show that the specific life experiences of women and systematically disadvantaged minority groups, like African Americans, lead to their overrepresentation in certain fields and underrepresentation in others. Natural language extracted from RateMyProfessors.com was used as a tool to measure the importance of these kinds of experiences in different academic disciplines. The frequency of key words such as "experiences" and "stories" corresponded significantly with diversity of PhD earners. Generally, fields with high relative value of experiences were likely to have more women and African Americans, though race and intersectional data showed mixed results. Such a relationship present in natural language use is indicative of the importance of experiences and life perspective in determining diversity across academia. These findings are important for continuing to address social injustice and the persistent disadvantaged status of women and minority racial groups.

Introduction

The underrepresentation of females in academia is commonly assumed to be due to a lack of diversity in scientific fields. However, growing bodies of research are beginning to recognize that the problem is more complex. Recent data on earned doctoral degrees shows that in certain areas of STEM, like health science, psychology, and biology, females obtained the majority of degrees (70%, 71%, and 54%, respectively, in 2014) (Survey of Earned Doctorates, 2015). Strikingly, on the other hand, females were a minority in humanities fields like philosophy (29%) and music (39%). This shows that at the degree level, women are being systematically underrepresented in certain fields outside of the sciences. The gender composition of academic fields clearly depends on more factors than the division between STEM and humanities.

In a 2015 paper, Sarah-Jane Leslie and Andrei Cimpian created the 'field-specific ability beliefs hypothesis' (FAB) to better explain the distribution of diversity across academia (Leslie, Cimpian, Meyer, & Freeland, 2015). This hypothesis proposes that beliefs held in certain academic fields about the necessity of inherent intellectual talent causes women and minority groups, as victims of stereotypes about their natural mental abilities, to be underrepresented in those fields. Leslie and Cimpian's survey of academics confirmed the FAB hypothesis, showing a correlation between relative importance of natural intellect in a field and the diversity of that field. The field-specific ability beliefs hypothesis (FAB) was particularly valuable in that it could, in addition to shedding light on the gender gap, be extended to explain the underrepresentation of African Americans in academic fields.

In this paper, I both expand upon and critique Leslie and Cimpian's work. Leslie and Cimpian fail to include insights from feminist theory into their methodology, a particularly unfortunate oversight, given that their research is an attempt to overcome problems with gender diversity. My aim is to rectify this exclusion, using insights from the work of feminist theorists and critical race theorists as a guide. Specifically, my methodology incorporates *standpoint theory*, which holds that occupying a marginalized social position is often a valuable way to obtain knowledge that is hard, if not impossible, to acquire otherwise. The original FAB hypothesis considered only raw intellectual ability and hard work. It did not consider social position. By bringing standpoint theory into the scope of the discussion, I hope to show that the specific experiences of women and African Americans are valued in certain academic fields and not others. My goal is to demonstrate, as standpoint theory would perhaps predict, that the relative importance given to social position by members of a field is a predictor of diversity in that field, even more strongly than 'brilliance' and 'hard work'. The more importance life experience is accorded as a source of distinctive knowledge by members of an academic discipline, the greater diversity that discipline has. By focusing only on "hard work" and "brilliance", some vital insights of feminism are overlooked, and by including standpoint theory into this research, I hope to improve upon this understanding of underrepresentation in academia.

Previous Research: "Brilliance", "Genius" and (lack of) Diversity

Prominent work on lack of diversity in academia has focused on the conception of ability as a matter of nurture or nature, that is, whether certain skills are innate or the product of

practice and hard work. Although it is now known that this is not a useful dichotomy, since epigenetics has proven that genetics and environment interact, the distinction is not irrelevant. Women and African Americans are still subject to the prevalent stereotype that they have less innate intellectual talent than white males, and that therefore any success they achieve is the product of luck or hard work. Sarah-Jane Leslie and her colleagues took this phenomenon as a starting point for their work on diversity in academia. Their 2015 paper showed that academic fields in which brilliance is perceived as important for success are less diverse across both gender and race. Conversely, fields where effort is perceived as the only requirement for success have higher representation of women and African Americans.

In 2016, Sarah-Jane Leslie and her colleagues published a follow-up study to their 2015 work in which they proved again that, because women and African Americans are stereotyped as possessing less natural talent, they are greatly underrepresented in those fields that value natural talent (Storage, Horne, Cimpian, & Leslie, 2016). This time, instead of using a survey method, they assessed a field's relative importance placed on raw intellectual ability by counting the frequency of the words "brilliant" and "genius" in student reviews of professors on RateMyProfessors.com. They then compared the frequency of the two words in each field to data on female and African American representation in that field. Replicating the results of the previous study, greater importance of natural talent (higher frequency of "brilliant" and "genius") correlated with lower diversity.

This finding was no doubt valuable, but by focusing only on hard work and brilliance, it missed something important. Women and African Americans have been theorizing about their marginalized social situation for hundreds of years, and their contributions should be included

in the discussion of their own putative inequality. After all, who better to understand their exclusion from academia than the ones excluded? This is the main tenant of *standpoint theory*, which emerges from feminism and critical race theory. In this paper, I bring standpoint theory to bear on inquiry into diversity in academia. To do so, I will first make an argument for standpoint theory and its power to enhance our understanding of diversity in academia. Following that are the results of a study I conducted with a method similar to Sarah-Jane Leslie's analysis, which provides statistical evidence for standpoint theory's relevance in explaining the differences in diversity across academic disciplines.

Standpoint theory and its relevance: an overview

In his 1921 essay "Of the Ruling of Men", W.E.B. Du Bois provides an epistemic argument for democracy: the best policies result from drawing upon the collective wisdom of all. In his argument, Du Bois presents a counterexample to a rival view, according to which the best policies are the result of deliberation by the "brightest" in a society. Du Bois' counterexample involves gender relations:

Now, manifestly, most husbands, fathers, and brothers will, so far as they know how or as they realize women's needs, look after them. But remember the foundation of the argument,—that in the last analysis only the sufferer knows his sufferings and that no state can be strong which excludes from its expressed wisdom the knowledge possessed by mothers, wives, and daughters (Du Bois, p. 83).

It is likely that men generally do love their wives, daughters, and sisters. And yet the societies run by men on behalf of women are harshly sexist, indeed, that is almost the definition of patriarchy. Without allowing women to take part in the legislative process, even the smartest and best intentioned men fail to craft policy that takes women's perspectives into account. The

best way to write policy that is responsive to the actual barriers facing women is to listen to those who know these barriers best: women. As Du Bois concludes, “only the sufferer knows his sufferings”, and so only the sufferer can properly understand and address the injustices they face. Though the above example considers the plight of women, Du Bois, as an African American, applies his argument to black Americans as well. Something about *being a member* of these disadvantaged groups, he argues, yields a crucial epistemic advantage in understanding society and social injustice.

Du Bois here is arguing for standpoint theory, a central topic in contemporary feminist epistemology. In the following sections, I will argue that the insights of standpoint theory provide a useful framework for thinking about issues of inequality and social injustice, and therefore for understanding underrepresentation and diversity in academia.

The social nature of knowledge

The sentiment behind the thought that a perspectival knowledge should serve as an epistemic ideal is that acquiring genuine knowledge does not require occupying a particular perspective. This epistemic ideal is naïve, but even assuming its truth is consistent with many of the insights of standpoint theory: I do not *need* to be in a wheelchair to arrive at the knowledge that certain elevator buttons are out of reach for people in wheelchairs. But if I *were* in a wheelchair, that knowledge would clearly be much more accessible to me. More dramatic forms of standpoint theory, such as Du Bois’ claim that *only* the sufferer can know about the character of their own suffering, hold that being a member of a social group is the *only* way to access some knowledge. But even absent this strong standpoint epistemological thesis, it is

easy to see that one's social position can be a huge advantage in gaining certain insights about the world.

More generally, it's obvious that acquiring knowledge depends on a myriad of unavoidably subjective factors— being in the right place at the right time, for example. Elizabeth Anderson usefully lists eight such factors. The first, embodiment, draws attention to the fact that people have unique physical locations or positions. The second is recognition that the mechanism by which we directly access our own mental or physical state is different from the mechanism by which we access the mental or physical states of others. In the latter case, being unable to inhabit the mind or body of another individual, we must rely on external cues and draw inferences. As individuals, we also have different minds and modes of processing information. Anderson writes that peoples' emotions and values, know-how of certain skills, cognitive styles in approaching and representing problems, and background beliefs can all influence the knower. Finally, our relationships with the object of the imparted knowledge or with the person imparting it also impact the kind of information taken in (Anderson, 2015).

Anderson also offers several ways by which these subjective factors can affect knowledge. Most deal with top-down influences: the representation of information in the knower's mind; attitudes toward beliefs, whether strong or doubtful; standards of justification, like the reliability of the source; and assessment of the significance of different claims. She also writes of one potential 'bottom-up', or external influence, in that subjective situatedness can determine "knowers' access to information". Research in cognitive science supports the existence of these effects. Much of psychology is dedicated to understanding how individual identity affects attentional processing, perception, and memory. For example, Dan Kahan et al.

showed that a subject's worldview can influence their impression of a demonstration and police response (Kahan, Hoffman, Braman, Evans, & Rachlinski, 2012). Research by Correll et al. suggests that unconscious stereotypes can influence whether participants see a harmless object or a gun in a target's hand at a very early level of perceptual processing (Correll, Wittenbrink, Crawford, & Sadler, 2015). It remains to be determined how and how early in knowledge gathering individual differences come to matter. Yet regardless of the mechanism by which it occurs, it is clear across disciplines that the way a person is situated affects their knowledge.

The particular kind of personal situation essential for standpoint theory is social situation. Every individual has many social identities, by virtue of identifying as a member of multiple social groups (Tajfel & Turner, 1986). These include, for example, race, ethnicity, gender, and sexual orientation. The theory that these social aspects of individual identity influence knowledge is a fundamental component of feminist epistemology and the core of standpoint theory.

Gender as an epistemic factor

Feminist epistemology is built on the importance of *gender* identity for knowledge. Sally Haslanger writes about gender as a social concept, identifying several dimensions in which society differentiates between male and female (Haslanger, 2000). There is, of course, the traditional conception of an individual being a member of a social group by identifying as a gender. But taking on a gender identity has social consequences beyond simple group affiliation. For example, social roles are often assigned along gender lines, relegating men to the battlefield and women to the household. A similar division occurs within norms of behavior, whereby women and men are expected to conform to a certain disposition in order to fit into

their gender roles. Certain traits or virtues are seen as more typically feminine, others as more masculine. In short, gender has a massive range of social implications that ripple into every aspect of everyday life.

The idea that gender may affect knowledge is by no means a new one. Aristotle believed that men's knowledge is superior to women's, because women's knowledge is determined more by emotion and less by reason, and is therefore more subjective. Lorraine Code was one of the first to formally question this assumption, not contesting the epistemic gender divide, but rather the conclusion that has been drawn from it by men. She writes:

There is an entire range of affective experience bound up specifically with being male or being female: experiences of sexuality and of parenthood, of general self-awareness as a physical and emotional being, and some aspects of interpersonal relations, which must of necessity be different for men and for women. The experience of what it is to be male or what it is to be female...must constitute an area where it is logically impossible for one group of human beings to know what another does. (Code, p. 275)

In other words, the experience of being female is one that males cannot have. For Code, this means that there is knowledge accessible only to knowers of a given gender, since knowledge is generated through first-hand perception or experience. "In the same way that a blind person cannot really know colour, that a deaf person cannot really know sound, so it is reasonable to argue that a person who is male cannot really know what it is to be female, and vice versa." (Code, 1981, p. 275). Instead of taking the gender discrepancy to prove Aristotle's claim, however, Code uses this as evidence to subvert that assumption and show that women's knowledge may actually be in some ways epistemologically superior to men's.

One might argue that women bring a richness of feeling and a depth of understanding to cognitive activity such that the final known *Gestalt* is richer, more multi-faceted, and better. Perhaps the admission of women to the kingdom of knowers, on an equal

footing, will effect a shift in the standard evaluation of knowledge claims, granting greater respectability to the contribution made by the affective side of human nature. (Code, 1981, p. 276)

Although Code did not take a strong stance on the advantages afforded the female standpoint, and focused on the affective nature of women's experience, feminist epistemologists have since taken Code's work and expanded on the ways in which women occupy epistemic positions different from men. Women can, for example, have gendered phenomenological knowledge, simply by occupying a female body and carrying it in a way consistent with expectations of femininity. They have *de se* knowledge, or first-hand knowledge of themselves, that depends on gender. Only a woman can experience male-on-female sexual harassment first-hand. Women also have access to all-female social spaces, and very limited access to all-male spaces, which may result in different knowledge of other people. Particularly relevant to this research, women can develop knowledge of some gendered skills, considered the responsibility or "proper province" of females, and may be restricted from learning stereotypically masculine skills. On this, Anderson writes,

To the extent that the skill is perceived by the agent as the proper province of the "other" gender, he or she may have a difficult time seeing himself or herself perform it confidently and fluidly. This inability to self-identify with the task can impair performance...To the extent that a skill is perceived by others as the proper province of one gender, others may grant or withhold acknowledgment of an agent's expertise. If the successful exercise of the skill requires that others be willing to accept it as a competent performance, others' gender-based readiness or refusal to grant expertise to an agent in exercising that skill can be a self-fulfilling prophecy. (Anderson, 2015)

Gender affects skills, or domain-specific knowledge on an individual, internal level, as well as on an external level. This entails that women are less successful in fields that require certain skills,

whether due to actual impaired performance or perceived inability. This specific instance of gendered knowledge very clearly has bearing on the representation of women in academia. The perceived masculinity of logical and 'objective' reasoning excludes women from academic fields that value it, like physics and philosophy.

Standpoint Theory

Drawing on the idea that knowledge can be differentially attained based on gender (and keeping in mind that much the same kind of mechanism creates a similar epistemological divide based on race), standpoint theory holds that there are social situations from which knowers occupy privileged epistemic positions, relative to knowers in other social situations. Many simple examples of this are quite intuitive. For example, an IT worker could be said to have more accurate and detailed knowledge about how to fix a computer than the average consumer, a product of her wealth of experience in the field. According to Anderson, a standpoint theory should consider a number of things, including the social situation of the privileged standpoint, the scope of its privilege, the features of the social situation that create privileged knowledge and how they do so, the ways in which the knowledge is privileged, and the social situations that are epistemically inferior relative to it (Anderson, 2015).

Social standpoint theories attribute superior epistemic positions to groups that have been systematically disadvantaged by society. In America, this includes women and African Americans, among others. These groups, having experienced the undesirable end of inequality, have more accurate knowledge of the causes, scope, and manifestations of social injustice. Unlike the privileged groups, they recognize that inequality is not inevitable, but rather a product of certain social conditions (Anderson, 2015). The black and female standpoints, with

their access to the black and female conditions, present a more complete and representative picture of society, while the standpoints of the socially advantaged may overlook injustice. In short, whereas the dominant groups are materially privileged, the oppressed groups are epistemically privileged.

Potential implications of the standpoint theoretical framework

One might assume, given the proposition that disadvantaged groups are epistemically privileged, that such groups are particularly well-suited for academia, the domain in which knowledge is king. Of course, the situation is not so simple. The privileged standpoint of women and minorities applies to knowledge of a specific sort, namely, knowledge of society. Women and African Americans are not privy to an enhanced knowledge of, say, physics. On the other hand, because of the social nature of knowledge and knowledge acquisition, women and racial minorities may feel more confident in performing skills that have been stigmatized as 'their domain'. They are given more opportunities to learn and practice such skills, and are more likely to be seen as successful if the task is in line with their gender or racial role. These mechanisms may be the cause of underrepresentation and lack of diversity in some academic fields, and overrepresentation in others.

One concern this theory of diversity needs to address is whether it makes a case for the diversification of academia, or merely describes a true and necessary feature of the domain, in which the epistemic position of women and African Americans makes them inherently a better fit for certain fields over others. Are 'feminine' skills useful in physics? Do the feminist and black standpoints have a place in all of academia? Perhaps this theory entails that women and African

Americans are actually better contributors to fields where their unique social perspective is valued.

However, it's not easy to reject the view that marginalized standpoints have a great deal of usefulness even in fields where women and minorities are not commonly represented. For one thing, academic fields dominated by white males are subject to the same social inequalities that are found in society as a whole. Working in academia, like any occupation, involves social interaction, funding, and recognition of accomplishments. A department that is not diversely staffed will struggle to treat its employees and students equally, just as the government struggles to address inequalities in society.

The perspective of disadvantaged groups can also contribute to the material study conducted in any academic field. Scientific progress is just the constant realization that previous assumptions were incorrect. Women and African Americans, with their non-male and non-white experiences, may be able to direct research toward questions that are not often considered in a field. For instance, entire branches of philosophy, like feminist epistemology, would not have been created without the unique approaches of women and African Americans. As Du Bois said, "the vast and wonderful knowledge of this marvelous universe is locked in the bosoms of its individual souls. To tap this mighty reservoir of experience, knowledge, beauty, love, and deed we must appeal not to the few, not to some souls, but to all" (Du Bois, 1920, p. 81).

Moreover, there are standpoint theoretical positions, even very conservative ones, that would buttress the conclusion that members of marginalized groups may be particularly valuable contributors to fields that are even seemingly distant from their experiences.

According to the standpoint theoretic tradition deriving from Karl Marx, members of privileged groups face certain epistemic obstacles that are not shared by members of oppressed groups, namely the epistemic obstacles erected by the myths they must tell themselves to justify their own privileged social position. Who is to say what the downstream effects of epistemic obstacles of this sort are? Privileged birth position is completely accidental; the myths that one must tell oneself to obscure this fact are, as the history of eugenics and “race science” demonstrate, ones that negatively impact work both in biology and social science.

A Brief Note on Intersectionality

All identities are multifaceted and intersectional, in that they are comprised of many aspects, all of which interact with each other. This is a particularly crucial point to recognize when analyzing identities that carry with them a history of systematic discrimination and oppression. As Kimberlé Crenshaw wrote, “Because the intersectional experience is greater than the sum of racism and sexism, any analysis that does not take intersectionality into account cannot sufficiently address the particular manner in which Black women are subordinated.” (Crenshaw, 1989, p. 140). While white women enjoy racial privilege and black men enjoy gender privilege, black women are subject to systematic oppression on both fronts. What’s more, racism and sexism take very different forms, and, as Crenshaw points out, their effects are not merely additive, but interactive and complex.

A thorough application of standpoint theory to the underrepresentation of women and racial minorities in academia will recognize that those groups are not mutually exclusive. The standpoint of African American women is necessarily different from the standpoints of white women and African American men, as they form life experiences under multiple, interacting

systems of oppression. This could mean that black women are affected uniquely by the importance of standpoint in academic disciplines.

Due to data constraints, the brilliance language study described above did not consider questions of intersectionality. This study, therefore, aims to improve on previous work by considering the interactional effects of gender and race that may be at play in creating diversity gaps in academia. For example, research on the intersectionality of blackness and femaleness might suggest that black women are more severely affected than white women by the stereotypes and different value systems in operation across academic fields.

Present Study

The present research attempted to address three main questions, in order to evaluate whether social standpoint theory truly does explain the distribution of diversity in academia. These questions were: 1) Does the frequency of the words “experiences” and “stories” in student reviews predict gender diversity? 2) Does it predict racial diversity? And 3) Are the effects different when considering gender and race simultaneously? Our hypothesis was that greater frequency of the target words, indicating a greater importance of standpoint, would correlate with greater diversity in a field, at both the Ph.D. and bachelor levels, and along both the dimensions of gender and race. I also hypothesized that the effect would be greater for black women than white women, since they are members of multiple disadvantaged groups. As additional checks, I used my method to briefly replicate the effect of “brilliance” and “genius” as described in the previous research, and I examined the ratio of number of times the words were used for male instructors to number of times they were used for female instructors.

Methods

All data used in this study was obtained from public datasets available on the internet. Data on Ph.D. diversity was obtained from the National Science Foundation Survey of Earned Doctorates, which reports demographics of Ph.D. earners (Survey of Earned Doctorates, 2015). Data on the diversity of scientific bachelor's degrees was also obtained from the NSF (Science and Engineering Degrees, by Race/Ethnicity of Recipients: 2002–12, 2015). The measures of diversity used in analysis were proportions, for example, the percent of all PhD degrees that were earned by females, or the percent earned by African Americans, in the most recent available year. For intersectional analysis, demographic data on Ph.D. earners and bachelor's degree earners was taken from the same NSF report used in the original undergraduate analysis (Science and Engineering Degrees, by Race/Ethnicity of Recipients: 2002–12, 2015). In the intersectional portion of the analysis, the measure of diversity was the proportion of women of a given race, like African American, among all degree earners in the year 2012.

The second type of data used was the perceived importance of life experiences in academic fields, assessed with the method used in Sarah-Jane Leslie's 2016 paper, counting frequencies of certain words in online student reviews. Whereas her 2015 study relied on a survey asking explicitly about how much brilliance was perceived as important, the later study proved that the same stereotypes and perceptions are present in natural language use, in this case, student reviews. This method is interesting not only because it replicated the results found in the earlier study on brilliance and genius, but also because it proved that the effects of stereotypes can be implicit. It is for this reason that the same method was used in the present study. The effects of standpoint theory and differential experiences are not often considered in

explicit discussions of diversity in academia. Using natural language analysis has the potential to show unconscious, or implicit effects of social standpoint theory.

The natural language measure in this case was the number of times certain words were used in student reviews of professors. The frequency of words in student reviews was extracted from the Gendered Language Tool (GLT), a web app that reports the number of times a word was used per million reviews on RateMyProfessors.com (Schmidt, 2015). Because data from the NSF included many academic fields that were not reported by the GLT, some condensing and selection was required to ensure the fields matched up. Three of the fields reported by the GLT app were too broad to be accurately mapped onto NSF fields. These were: “science”, “fine arts”, and “humanities”.

The words “experiences” and “stories” were chosen for collection in the GLT both for their relative abundance of data points and for their perceived relevance to standpoint theory. The motivating idea was that women and minorities that are subject to systematic social disadvantage have unique experiences that in turn give them unique epistemic positions. Another benefit of the words “experiences” and “stories” was that their meanings seemed to be relatively constrained, so that it was likely that their use in student reviews would track with the meaning we intended. Other terms, like “perspective”, “viewpoint”, “empathetic”, and “life experience” were also considered, but not included in analysis due either to lack of data, or to their usage in student reviews being different from the connotation that would be relevant for the issue of standpoint theory.

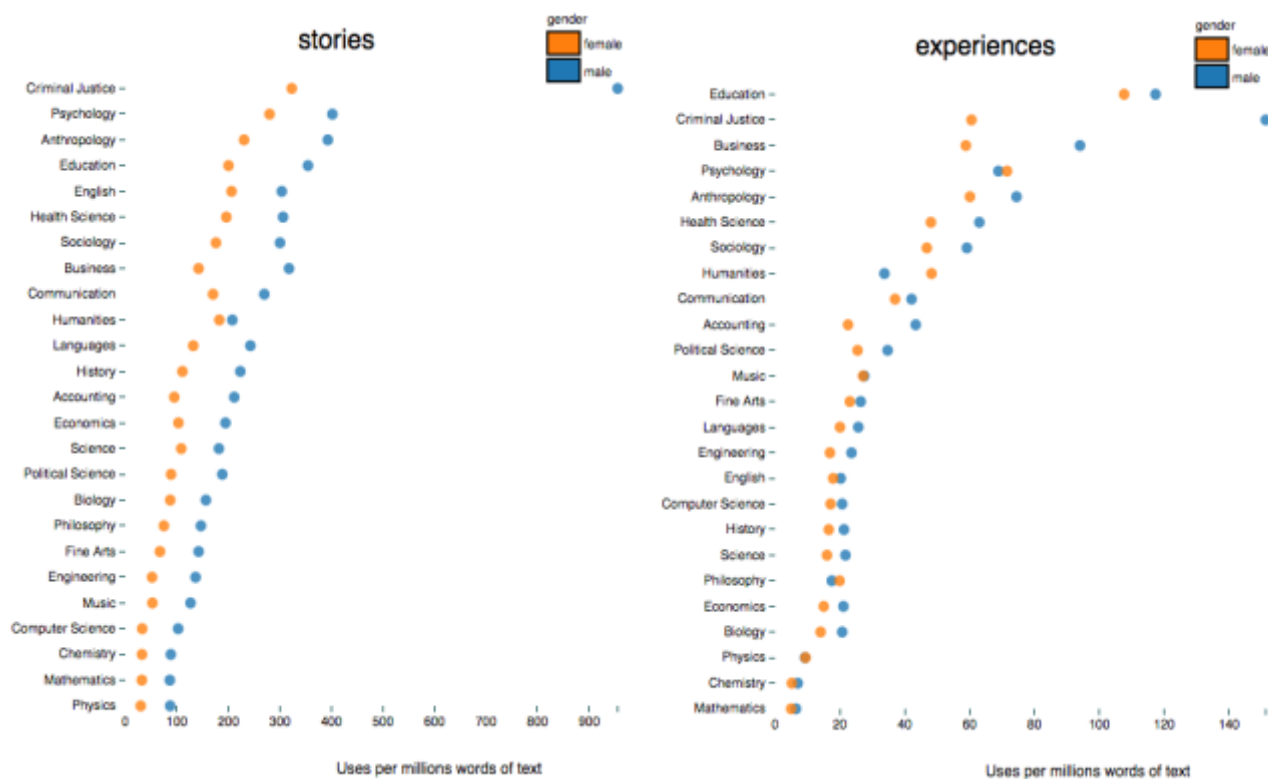


Figure 1: Data from the Gendered Language Tool. The frequencies of "stories" and "experiences" are represented in uses per million words of text in the reviews, and separate frequencies are recorded for female instructors (orange) and male instructors (blue).

Data analysis was completed using the statistical language R. The RateMyProfessors.com data was standardized in the same way as was done in the Storage et al. 2016 paper. The means of the frequencies of “experiences” and “stories” was calculated, combining both genders for each word, then the standard deviations of the same sets were calculated. Distance from the mean was found by subtracting the mean of “experiences” or “stories” from the frequency of the word given the field and gender, the resulting value was divided by the standard deviation (creating four z-scored variables for each field). The final standardized value used in regression analysis was the average of these four variables across the two words and genders. For brevity, this paper shall henceforth refer to these standardized values as the standpoint language score.

Replication of Brilliance and Genius study

To ensure that the updated datasets and modified field groupings used in this study were valid for analysis, the data was first used to replicate the Storage et. al. study. Using the 2011 NSF Survey of Earned Doctorates, as they did, a correlation was found between the standardized frequency of “brilliant” and “genius” and gender diversity in the field ($r = -.52$, $p = .03$). Because the subfields reported in the 2014 dataset were slightly different from the subfields reported in the 2011 data, a modified grouping of subfields was created to match the data to the Gendered Language Tool. Notably, four fields that were not included in the Storage et. al. study, ‘Accounting’, ‘Business’, ‘Health Science’, and ‘Criminal Justice’, were accounted for by the new data. The brilliance language effect was similar with the updated 2014 data and groupings, with greater frequency of “brilliant” and “genius” in reviews significantly predicting a lower proportion of females in the field ($r = -.42$, $p = .05$). Therefore, in the present study, data on earned doctorates from 2014 and 2015 was used, instead of the 2011 data used in the SJ study.

1) Does use of “experiences” and “stories” predict gender diversity in academia?

To answer this question, I compared the frequency of use of “experiences” and “stories” to female representation at both the Ph.D. level and the undergraduate level. At the post-graduate level, my measure of diversity was the proportion of female to male earned doctoral degrees in 2014. After running a linear regression, there was a significant correlation between the percentage of female Ph.D. degrees earned and the standpoint language score. Fields in which “experiences” and “stories” were used more frequently were more gender diverse ($r = .69$, $p < .001$). After performing the regression, both the fields computer science and business

were determined to be high leverage points for the model, and were subsequently excluded. The resulting pattern of data was fit with a quadratic regression ($r^2 = .73$, $p < .001$). The results showed a stronger correlation than the linear model ($r = .85$). In addition, the analysis made sense in several ways. For one thing, it is unsurprising that criminal justice and business were dissimilar from the rest of the fields, since their work is conducted in the field, rather than the library. This likely means that the kinds of 'stories' that are told in those departments are more related to the job and less to life experiences. Both were fields that were left out of Sarah-Jane Leslie's original study. Another benefit of the quadratic fit is that it reaches a horizontal asymptote, or levels off. This reflects the fixed capacity of the percentage of female degrees, since it would be impossible for women to earn more than 100% of Ph.D. degrees in a year.

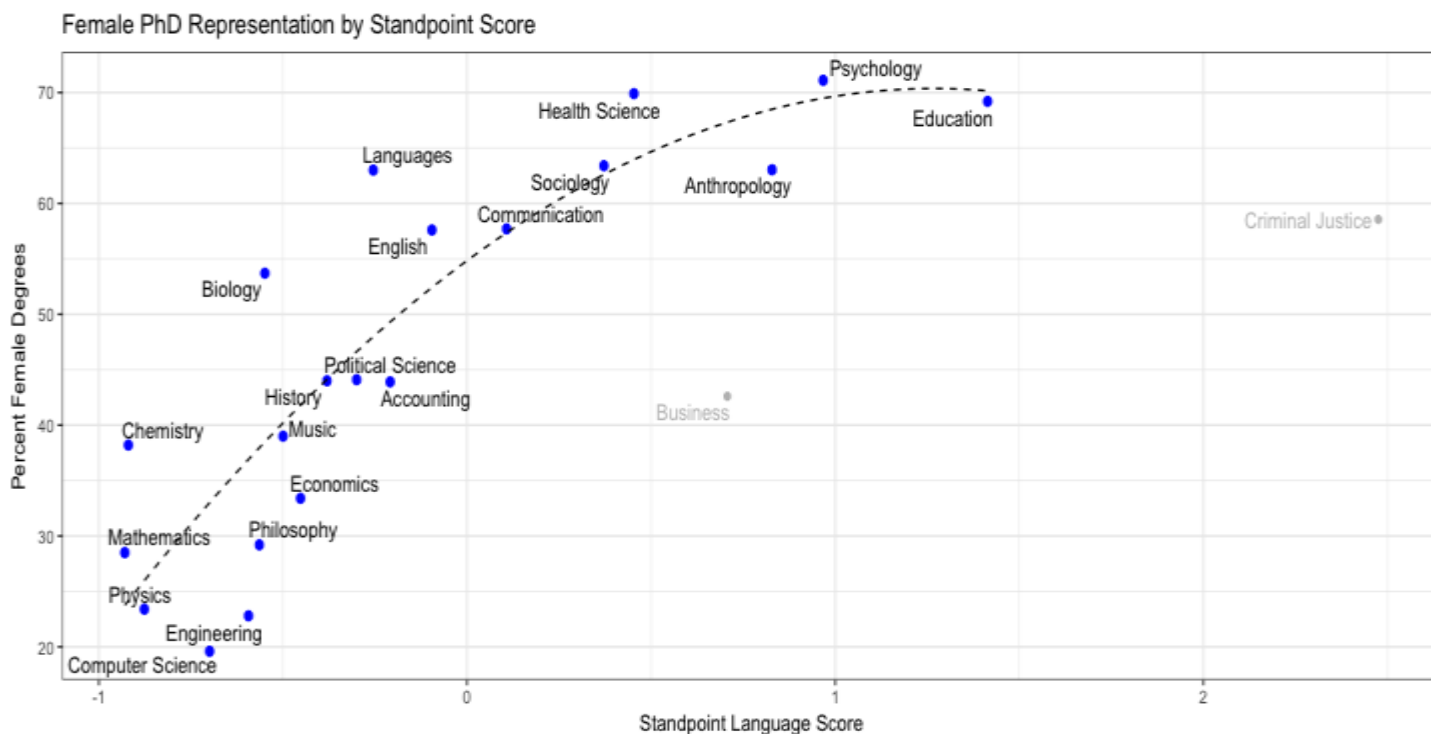


Figure 2: Female representation at the Ph.D. level in each academic field by the standpoint language score. Fields with greater use frequency of "experiences" and "stories" were more likely to have a greater proportion of female Ph.D. earners.

With this new fit, of course, the pattern of results was the same: as the relative value of “experiences” and “stories” increased, so did representation of women.

To evaluate gender diversity across multiple levels of education, a second analysis was conducted using the demographics of undergraduates in different majors. Unfortunately, data constraints in the NSF dataset on bachelor’s degrees prohibited this section of analysis from including non-STEM fields, so results were absent of the effect of white-and-male dominated humanities fields like philosophy and music. Nevertheless, the frequency of “experiences” and “stories” also significantly predicted gender diversity across fields for earned bachelor’s degrees ($r = .77$, $p = .014$). As with the PhD data, the social sciences scored relatively high on both female representation and the standpoint language score, while physics, computer science, and engineering were again low on both.

Overall, this data provides good support for the hypothesis put forward with standpoint theory. Women are differentially represented in fields that value experiences, at both the doctoral and undergraduate levels.

2) Does use of “experiences” and “stories” predict racial diversity in academia?

As in Question 1, this analysis was completed with data on both graduate and undergraduate students. At the Ph.D. level, the same effect that was seen for female diversity held for predicting the representation of African Americans across fields. For this analysis, data on racial composition of fields was taken from the Survey of Earned Doctorates from 2015. Linear regression showed that a greater standpoint language score was strongly associated with a greater proportion of black PhDs in a field ($r = .76$, $p < .001$). With the data on bachelor’s

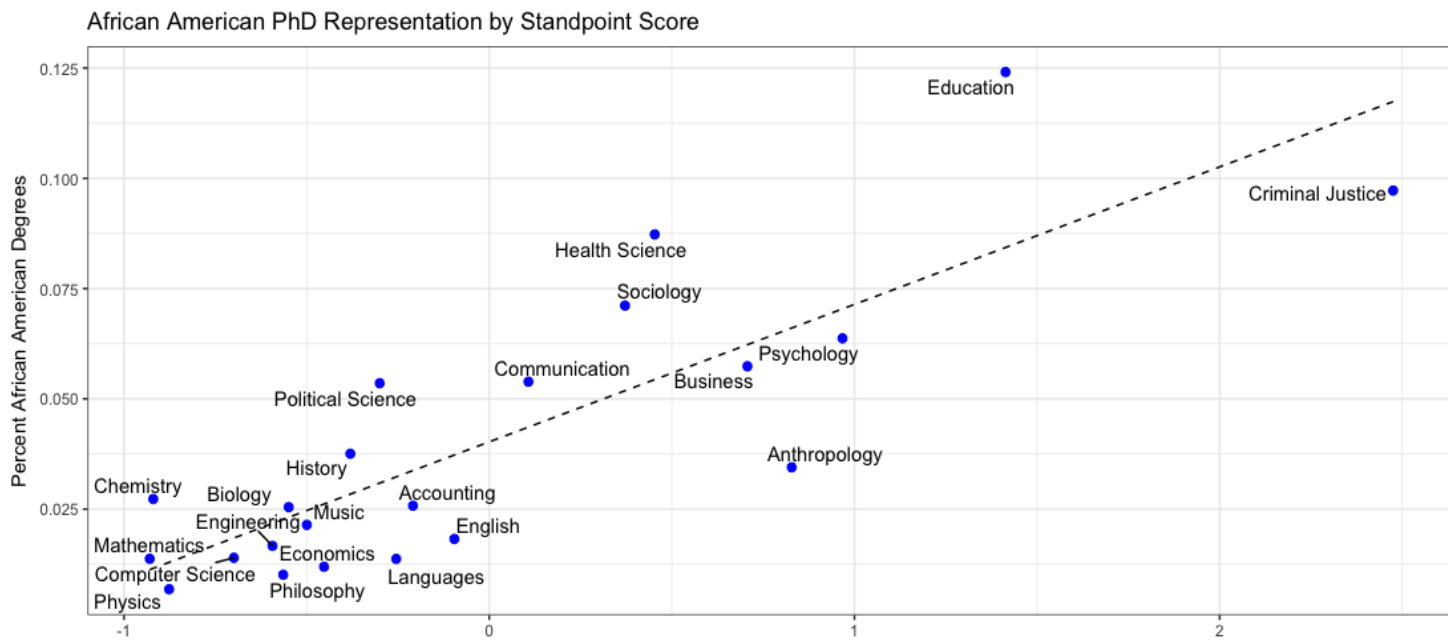


Figure 3: African American representation at the Ph.D. level by standpoint language score. As with female representation, a greater standpoint language score was indicative of a greater proportion of earned black Ph.Ds.

degrees, however, the standpoint language score did not significantly predict African American representation ($r = .39$, $p = .3$). This may suggest that standpoint theory has different effects across the levels of education, becoming much more predictive of African American representation only at the post-graduate level. On the other hand, it could be that the highly limited undergraduate data, limited to only scientific fields, caused this result.

Because data on multiple races was available, the relationship was analyzed for other races as well, namely, Native American, Asian American, Hispanic, and white. There were no significant results at either education level for predicting the representation of white and Hispanic degree earners. This indicates that the significant results obtained for African American representation is not simply a matter of standpoint theory predicting representation for all races. For Ph.D. earners and bachelor's earners alike, the standpoint language score significantly predicted greater representation of Native Americans (Ph.D.: $r = .75$, $p < .001$; bachelor: $r = .84$, $p = .005$). This finding makes sense under the standpoint theory hypothesis,

since Native Americans are another disadvantaged minority group in America. The only other significant results occurred at the bachelor's level, where the standpoint language score showed a strong negative correlation with Asian American representation ($r = -.73$, $p = .03$). This means that, unlike the findings for African Americans and Native Americans, fields that valued "experiences" and "stories" more had less Asian Americans, proportionally. Given that the fields included at this level were primarily STEM fields, it may be useful to interpret this result with stereotype research. Asian Americans are consistently expected to be naturally gifted at mathematics (e.g., Shih, Pittinsky, & Ambady, 1999), which perhaps cancels out the effects of standpoint.

3) Are the effects different when accounting for race and gender simultaneously?

Data on Ph.D. degrees that accounted for both race and gender, retrieved from the NSF website, was used to perform an analysis on intersectional effects of social identity and standpoint theory. This dataset suffered from the same constraints as the bachelor's data used above. It included only nine fields, mostly STEM: biology, chemistry, computer science, education, engineering, health science, mathematics, physics, and psychology. Despite this limitation, a strong correlation was found between the standpoint language score and representation of females of all races ($r = .86$, $p = .002$), as expected from the results of the preceding analyses. The same effect was again present for representation of African Americans of all genders ($r = .79$, $p = .007$). In the intersectional piece of the analysis, the standpoint language score was predictive of female African American representation at a rate very similar to that of all women ($r = .86$, $p = .002$). Unlike the hypothesis predicted, the effect was not significantly stronger than white women ($r = .84$, $p = .003$), but the results may nonetheless be

consistent with expectations. First and foremost, when considering specifically the proportion of black women among Ph.D. earners, data is somewhat scarce, since there are unfortunately relatively few black Ph.D. earners, even fewer of whom are women. The similarities in the correlations between white women, black women, and all women is not at all surprising. Most female Ph.D. earners are white, so they should be expected to carry the effect for females of all races. Overall, results at the Ph.D. level were inconsistent with the hypothesis that African American women would be affected to a greater degree by standpoint. This could mean that, out of gender and race, the female identity is the more strongly affected by standpoint.

At the bachelor's level, results resembled the patterns obtained in questions 1 and 2. Specifically, the representation of white women was significantly correlated with the standpoint language score ($r = .80$, $p = .006$), while the relation to representation of black women was not quite significant ($r = .53$, $p = .08$). This seems to indicate that, at the undergraduate level, the female identity is less salient a predictor of black female representation. Because the fields included in this analysis were limited to the same nine included in the intersectional Ph.D. analysis, and a significant relationship was found for black women at that higher level, it appears that an important variable in this case is education level.

As in Question 2, data on multiple races was available, so analysis was also conducted to explore potential effects of standpoint for Native American, Asian American, and Hispanic women. At both the Ph.D. and bachelor's level significant effects were found only for Native (Ph.D.: $r = .73$, $p = .02$; bachelor: $r = .84$, $p = .003$) and Hispanic women (Ph.D.: $r = .78$, $p = .008$; bachelor: $r = .74$, $p = .01$). As both are marginalized groups, this is an unsurprising result. That no significant correlation was present between standpoint language score and representation

of Asian women is interesting, suggestive of a cancelling interaction between race and gender. That is, the strong stereotypes about Asian aptitude for science and math may cancel out the effects of standpoint on the female identity. If true, this could be compelling evidence for the complexity of intersectionality.

Discussion

The results obtained in answering the three questions provide substantial support for using standpoint theory to predict the spread of diversity in academia. The standpoint language score was strongly correlated with the representation of women and African Americans at the Ph.D. level and with women at the bachelor's level. The analysis confirmed our hypothesis that considering feminist theory would predict the distribution of diversity more accurately than studies of 'brilliance' and 'hard work' alone. In addition, the few variations from our expectations, like the lack of correlation between standpoint language and African American representation at the bachelor's level, and the mixed results in the intersectional analysis, leave interesting avenues for further research to pursue. However, this study, like most, is imperfect. There are a few lingering questions and limitations in the methodology that should be addressed before concluding.

The male-female ratio on the Gendered Language Tool

One remaining question of this research is whether the terms "experiences" and "stories" themselves are gendered or racialized terms. The former of these was investigable, because the Gendered Language Tool, used to obtain the frequency of the words used in this study, reports the frequency of words separately for reviews of male and female instructors.

For instance, in the “brilliant” and “genius” study, both words were used more often for males than females, which was indicative of the stereotypes against women that they used to explain their results. In this study, it should be noted that “experiences” and “stories” were also used more frequently for male instructors than female instructors, despite the overall correlation of their frequency with more female instructors.

To account for this, a brief analysis was conducted to ascertain if the male-to-female ratio of use of “experiences” and “stories” is smaller than the ratios of “brilliant” and “genius”. If this were the case, it would mean that, sensibly, the terms associated with female representation were used more for female instructors relative to other terms. However, this was only the case for “experiences”, with a mean male-female ratio of 1.32:1 across all fields. The ratio for “stories” was 2.12:1, meaning the word was used more than twice as often for male instructors. By contrast, the ratios for “brilliant” and “genius” were 1.82:1 and 3.14:1, respectively. Of course, these ratios included fields like criminal justice and business, which had previously been determined to be related to “experiences” and “stories” differently than other disciplines. Without those fields included, the average male-female ratio for “experiences” came down to 1.21:1, and “stories” to 2.07:1. Both still indicated a masculine use bias. This could suggest that though the words are predictive of female representation overall, they are still gendered in practical use.

Other concerns

One potential concern for this study is the validity of using RateMyProfessors.com as a source of natural language data. The website has a reputation for being a hotbed of discontent, so it may not reflect typical language used in teacher evaluations. Additionally, it fails to report

several variables of interest, including the gender of the students writing the reviews. If that data were available, it could be interesting to see whether or not female students are more likely to use the words “experiences” and “stories”, the logic being that they, as women, are more in-tune to the value of life experience. Overall, the platform has its limitations. Future studies with natural language measures might choose to use instead more official evaluative sites, or news articles about academics.

Additionally, there is remaining concern about the use of “experiences” and “stories” to adequately represent standpoint effects. There was some difficulty in choosing words that would best target the effect proposed by the theory, and there may be room for improvement. Specifically, it’s possible that the frequency of the words “experiences” and “stories” does not generalize to the broader phenomenon proposed by standpoint theory. It does seem to leave out the notion of perspective, which is an important aspect of standpoint. In the studies on the effects of brilliance and genius, Sarah-Jane Leslie and her colleagues confirmed that the brilliance language score corresponded with real beliefs about natural intellectual talent by taking a survey to assess the explicit beliefs about academic fields held by members of those fields. Such a survey could be included in further research to ensure the effect of the use of “experiences” and “stories” tracks with explicit observation of standpoint in action.

Conclusions

The relative importance placed on life experiences, as measured by the frequency of the words “experiences” and “stories” in student reviews, can significantly predict diversity in academic fields at the Ph.D. and bachelor’s levels, and across the dimensions of both gender

and race. This suggests that standpoint theory is a powerful tool for explaining the continued lack of representation for disadvantaged groups in parts of academia. The effect is particularly strong for women, according to the above analyses, and more mixed, though still positive, for African American representation. More complete data on gender and racial composition of all academic fields (not just STEM) and on the interaction of those social identities, is necessary to perform a more thorough analysis of these effects. However, the data analyzed here provides compelling evidence that feminist standpoint theory can successfully explain social inequality.

The findings of this study do not imply that the studies on “brilliance” and “hard work” are incorrect, but merely build on and improve the model. It is likely that both the effects of negative stereotypes about innate intellect and of perceived value of life experiences contribute to the distribution of diversity across academic disciplines. Furthermore, these two models are unlikely to explain in completeness why women and disadvantaged minorities struggle to achieve proper representation in much of academia. The problem is a complex one, influenced by innumerable social factors. Insights from feminist theory offer the best chance at disentangling these factors and coming to a full understanding of academic inequalities.

This study, as purely correlational, still leaves the precise cause of the standpoint theory effect ambiguous. It could be that females and stereotyped racial minorities are drawn to fields where their experiences and stories are valued because they feel that those areas of academia are more interesting to them and relevant to their lives. They may feel more valued and appreciated in such fields. Or they may be funneled into those fields by a society with a skewed perception of success in different academic fields and equally skewed views on female and black strengths. More research is necessary to examine these questions, though it may be

preliminarily hypothesized that all these factors contribute and interact. Regardless of the specific social or cognitive method, however, it is important to acknowledge the effect of standpoint on creating disproportionate distributions of social groups across academic fields.

Standpoint theory not only helps explain gender and racial divisions, but makes a case for increased diversity in every setting. In all fields, scientific or not, advancement is best achieved through the consideration of a diverse array of opinions and experiences. Without women and racial minorities, it is unavoidable that male dominated fields will be dominated by the male perspective and white-dominated fields will be dominated by the white perspective. Recognizing that female and black experiences are vital, and that they cannot be incorporated without including women and African Americans into academia, is crucial in addressing the current lack of diversity in academic fields from physics to philosophy.

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Appendix

Table 1: Matching field names across datasets

GLT field label	Ph.D. subfield labels included	Bachelor's field labels included
Biology	Biological, biomedical sciences	Biological sciences
Health Science	Health Sciences	Health
Chemistry	Chemistry	Chemistry
Computer Science	Computer and information sciences	Computer sciences
Mathematics	Mathematics	Mathematics
Psychology	Psychology	Psychology
Physics	Astronomy; Physics	Astronomy; Physics
Anthropology	Anthropology, cultural; Anthropology, physical and biological; Anthropology, general	
Economics	Economics, econometrics	
Political Science	Political science and government	
Sociology	Sociology	
Criminal Justice	Criminal justice and corrections; criminology	
Engineering	Engineering	Engineering
Education	Education	Education
Languages	Foreign languages and literature	
History	History	
English	Letters	
Music	Music; Musicology/ethnomusicology; Music performance; Music theory and composition	
Philosophy	Philosophy, ethics	
Accounting	Accounting	
Business	Business administration and management; Finance; Human resources development, Management information systems/business statistics; Marketing management and research; Organizational behavior; Other aggregated business fields	
Communication	Communication	

Table 2: Gendered Language Tool Data

Field	F.Experiences	M.Experiences	F.Stories	M.Stories	f.std.exp	m.std.exp	f.std.stor	m.std.stor	std.exp.stor
Sociology	46.818	59.186	175.931	300.186	0.257	0.637	-0.102	0.696	0.372
History	16.581	21.269	110.945	223.178	-0.674	-0.529	-0.520	0.201	-0.380
Anthropology	60.117	74.492	230.497	392.982	0.666	1.108	0.248	1.292	0.828
Philosophy	19.923	17.518	74.881	146.747	-0.571	-0.645	-0.751	-0.290	-0.564
Political Science	25.464	34.736	88.894	188.289	-0.400	-0.115	-0.661	-0.023	-0.300
Education	107.684	117.385	200.357	354.474	2.129	2.427	0.055	1.044	1.414
Criminal Justice	60.603	151.391	323.008	955.371	0.681	3.473	0.842	4.904	2.475
English	17.926	20.278	206.233	303.642	-0.632	-0.560	0.092	0.718	-0.095
Economics	15.019	21.1	103.151	194.443	-0.722	-0.535	-0.570	0.017	-0.452
Music	27.157	27.513	52.669	126.628	-0.348	-0.337	-0.894	-0.419	-0.500
Communication	37.033	42.124	170.305	269.731	-0.044	0.112	-0.138	0.500	0.107
Psychology	71.571	68.924	279.981	401.812	1.018	0.937	0.566	1.348	0.967
Languages	20.047	25.688	131.882	242.74	-0.567	-0.393	-0.385	0.327	-0.255
Business	58.869	94.065	142.353	317.743	0.627	1.710	-0.318	0.809	0.707
Health Science	48.09	63.035	196.132	306.171	0.296	0.755	0.027	0.734	0.453
Engineering	16.949	23.598	51.978	136.432	-0.662	-0.458	-0.898	-0.356	-0.594
Computer Science	17.141	20.718	32.877	102.6	-0.656	-0.546	-1.021	-0.573	-0.699
Biology	14.067	20.724	87.23	156.44	-0.751	-0.546	-0.672	-0.227	-0.549
Accounting	22.523	43.405	95.044	211.419	-0.491	0.152	-0.622	0.126	-0.209
Mathematics	4.97	6.462	32.182	86.41	-1.031	-0.985	-1.026	-0.677	-0.930
Chemistry	5.193	7.028	32.42	88.388	-1.024	-0.967	-1.024	-0.665	-0.920
Physics	9.404	9.253	29.92	87.118	-0.894	-0.899	-1.040	-0.673	-0.877

F.Experiences = frequency (per million words) of word “experiences” for female instructors

M. Experiences = frequency (per million words) of word “experiences” for male instructors

f.std.exp = standardized values for female frequencies of “experiences”

m.std.exp = standardized values for male frequencies of “experiences”

std.exp.stor = average of the four standardized values (male and female x “experiences” and “stories”), used in regression analysis

Figure 4: Proportion of Female STEM Bachelor's Degrees by Standpoint Language Score

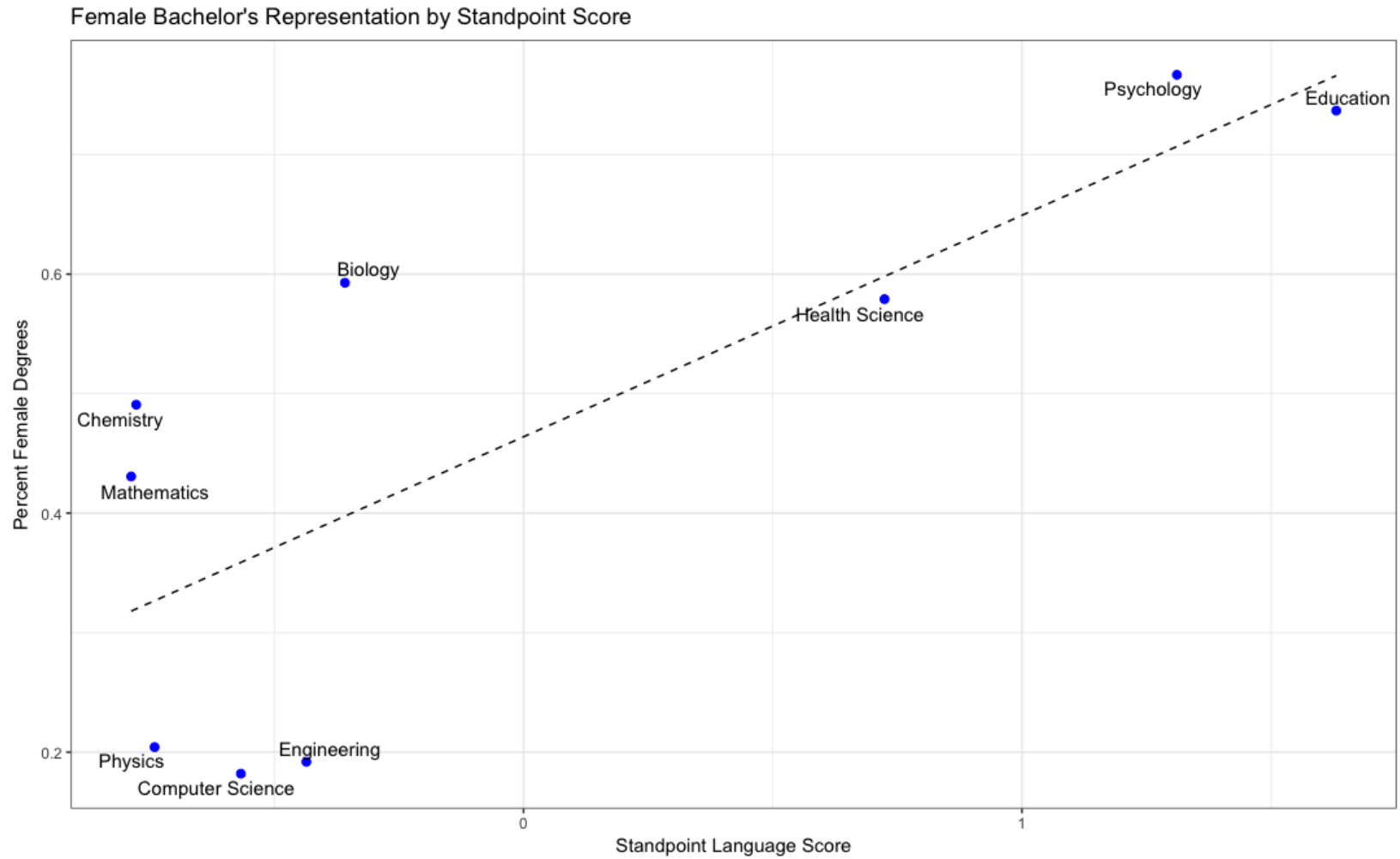


Figure 5: Proportion of African American STEM Bachelor's Degrees by Standpoint Language Score (no significant correlation)

