Journal of Women and Minorities in Science and Engineering 28(4):25–49 (2022)

ANALYZING SIGNALS OF (IN)EQUITY AND POWER IN ENGINEERING COLLEGE INTERNSHIP ADVERTISEMENTS

Annie M. Wofford[1,*] & Katie N. Smith[2]

[1]*Department of Educational Leadership, Northern Arizona University, Flagstaff, Arizona, USA*

[2]*Department of Education Leadership, Management, and Policy, Seton Hall University, South Orange, New Jersey, USA*

*Address all correspondence to: Annie M. Wofford, Northern Arizona University, S. San Francisco Street, Flagstaff, AZ 86011, USA, E-mail: annie.wofford@nau.edu

Gendered and racialized barriers play a significant role in undergraduate students' interest and persistence in engineering. While sexist and racist environments have been widely investigated in engineering academic settings, the impediments to equity in work-related engineering socialization experiences are far less explored. Specific to undergraduate students' work settings, internships serve as anticipatory socialization experiences where students learn what it is like to work in certain fields. Yet, little is known about the cues that sponsoring companies provide to potential interns about organizational ideology and power. Drawing from 122 advertisements for college engineering internships, this study explored companies' language and linguistic tools in ads. Within a framework of signaling theory and feminist critical discourse analysis, we used document analysis to examine organizational statements of equal employment and diversity as well as (implicitly gendered and racialized) power structures signaled by linguistic tools (e.g., nominative personal pronouns). Findings reveal a lack of specificity in companies' explicit statements, suggesting that "diversity" language evades identifying concrete equity efforts. Further, results illustrate the complex nature of how companies used linguistic tools to promote their own diversity values and position interns' agency. Leveraging a feminist lens, we discuss how leaving inclusive practices and power structures unnamed may signal a performative commitment to equity. We conclude with implications for higher education researchers, practitioners in career services, and employers recruiting college interns.

KEY WORDS: *document analysis, feminist critical discourse analysis, engineering, equity, internships, job advertisements*

1. INTRODUCTION

Across engineering settings, gender and racial equity is a prominent concern. Unfortunately, undergraduate women* who enroll in engineering majors encounter gendered social, cultural, and organizational barriers that contribute to experiences of isolation, a

*In this study, we use the term "women" to align with the findings of cited work; however, when discussing our own interpretations, we use "women and femme-identifying students" to express our view that gender equity efforts should include transwomen, femme-identifying queer and non-binary folx, and ciswomen. Further, when using the phrase "women and femme-identifying students," we acknowledge that intersecting identities vary widely in terms of racial and ethnic identities as well as other historically oppressed social identities.

lack of belonging, stereotype threat, and a lower sense of self-efficacy, all of which may influence their persistence in the engineering field (Marra et al., 2009; Neumann et al., 2016; Woodcock and Bairaktarova, 2015). Color-evasive racism (Pawley et al., 2013) and anti-Black racism (Holly, 2020) also pervade undergraduate engineering culture, leading to the racial minoritization of students who identify as Black, Indigenous, and as Students of Color† and creating structural impediments to their success. Further, undergraduate Women of Color confront interlocking gendered and raced oppressions in engineering higher education settings, underscoring their experiences with engineering interest, social pain, navigation, and support (Ong et al., 2020).

While sexism and racism have been widely investigated in engineering academic settings, researchers have sparsely considered how oppressive norms are upheld as part of students' professional socialization experiences in engineering contexts. Given the commonality of internships among college students, especially those in engineering (National Association of Colleges and Employers [NACE], 2015), internship-related experiences may provide critical professional information for students, especially since internship experiences often directly influence career opportunities and decisions (Dailey, 2016; Nunley et al., 2016; Samuelson and Litzler, 2013; Smith and Gayles, 2018). However, research documents that racially minoritized students may struggle with feeling invisible or ignored at their engineering internship sites (Strayhorn and Johnson, 2016). Instances of gender bias in internships may also have detrimental consequences for women's perceptions of fit and interest in the field (Seron et al., 2016; Smith and Gayles, 2018). Further, while few studies have examined the internship experiences of trans* and non-binary students, these populations face unique oppressions that limit access and shape experiences related to applied learning opportunities (Stewart and Nicolazzo, 2018).

Given the ways that structural barriers underscore students' interest and persistence in engineering based on gender and racial identities, it is important to understand the various cues that undergraduate students receive related to engineering fields and careers. Discourse in formal contexts serves to signal and perpetuate gendered power structures, deterring women's belongingness (Gaucher et al., 2011) or favoring traditionally masculine roles and stereotypes (Parson, 2016). Slaton (2010) also revealed how U.S. engineering education has been historically steeped in whiteness, drawing attention to how celebratory discourse about diversity "may foreclose inquiry into the racialized functions of conventional gatekeeping tools such as standards of talent and eligibility" (p. 17). In the present study, we explore how inequity and power pervade discourses and linguistic tools within engineering internship advertisements—an important undertaking, as internships often serve as students' first opportunity to gain professional

† While "Students of Color," "Black, Indigenous, and People of Color (BIPOC)," and "racially minoritized" are common phrases for race/ethnicity in educational research, we also acknowledge the limitations of this phrasing. Racial and ethnic groups have vastly different realities and using such terminology separately from gender may indicate "an entrenched misunderstanding of how women's experiences as women also intersect with their experiences as members of ethnic minority groups, as well as other historically oppressed social groups" (Bowleg, 2008, p. 313). Thus, while terminology appears as distinct, it is also necessary to center Women of Color in any discussion about gendered and racialized discourse.

experience in their field (Dailey, 2016; Hora et al., 2020). As such, we ask the following question: How do companies signal ideas of organizational ideology and power within engineering internship job descriptions?

2. LITERATURE REVIEW

To provide context for this study, we first review relevant literature about internships as professional socialization experiences. Then, we discuss existing research on the history and purpose of job advertisements, including research that shows how indicators of diversity values may impact interest among prospective applicants.

2.1 Internships

Although many college students participate in internships (NACE, 2015), relatively little is known about these experiences. One challenge is that the term "internship" is ill-defined, creating difficulties in understanding these experiences across contexts (NACE, 2018). Recently, Hora and colleagues (2020) found that organizations and college students associate different values and language with internship positions, with organizations advancing a homogeneous discourse by uniformly describing internships as "experiential learning" opportunities that build students' social capital. By contrast, students acknowledged that the quality of internships varies tremendously. Students also shared that an ideal internship would enhance their competitiveness for future job opportunities, provide hands-on learning unavailable through their coursework, and afford them an opportunity to try out prospective career options (Hora et al., 2020).

Internships have been identified as one "high-impact" college experience that may foster student success (Kuh, 2008), although the nature and quality of internships varies (Dailey, 2016; Hora et al., 2020; McHugh, 2017). In general, internships serve as anticipatory professional socialization experiences where students learn what it is like to work in certain industries and positions (Dailey, 2016). Most existing research identifies positive outcomes for students in internships, including greater course knowledge (Green and Farazmand, 2012), technical skills and professional networks (Samuelson and Litzler, 2013), and job opportunities upon graduation (Nunley et al., 2016). Yet, some students may have negative internship experiences and alter their career goals (Dailey, 2016). Internship experiences may vary based on many factors including compensation, job characteristics, mentorship, and organizational culture (McHugh, 2017), with differences potentially exacerbated for students who hold minoritized identities in their fields (Seron et al., 2016; Smith and Gayles, 2018; Strayhorn and Johnson, 2016). While underexplored, such experiences may also vary by industry subfield due to disparities in representation by sex or race. For instance, in 2018, "female" individuals comprised less than 15% of bachelor's graduates in large engineering subfields such as aerospace, electrical and electronics, and computer engineering, but over 40% of bachelor's graduates in fields such as bioengineering/biomedical and environmental engineering (National Center for Education Statistics [NCES], 2019). Racial disparities are apparent between

subfields as well; among U.S. citizens and permanent residents, white students earned 68% of engineering bachelor's degrees in 2012 and were overrepresented in industries such as mechanical engineering, aerospace engineering, and civil engineering (National Science Board and National Science Foundation [NSB and NSF], 2014). We can only infer that these disparities impact student socialization experiences based on identity.

While some students may access internships through personal or faculty connections (Hora et al., 2020), or through campus career services offices (Davis and Binder, 2017; Rivera, 2015), many students secure internships without using campus services. According to a NACE (2020) survey of employers, companies found 64% of their interns through open applications. Because many students hold limited knowledge of their professional options, particularly students who are the first in their families to attend college (Parks-Yancy, 2012; Tate et al., 2015), the process of searching for internships may itself serve as an anticipatory socialization experience, with students gaining information about industries, occupations, and companies before an internship even begins.

2.2 Job Advertisements

Job advertisements (used interchangeably with the terms "job ads" and "job descriptions" in the present study) have been connected to goals of diversity and inclusion since their inception in the 1930s (Dobbin et al., 2015). By advertising job openings, companies increased transparency and expanded applicant pools, creating an accountability structure designed to promote fair hiring processes. As policies surrounding nondiscriminatory hiring practices evolved, companies were required to develop job descriptions to screen candidates based strictly on the needs of the position. Today, the U.S. Equal Employment Opportunity Commission (n.d.) prohibits discrimination against applicants or employees based on "race, color, religion, sex (including gender identity, sexual orientation, and pregnancy), national origin, age (40 or older), disability or genetic information" (para. 1), with equal employment opportunity (EEO) statements in job advertisements referring to legal compliance with federal policy.

With the development of technology over time, the advent of online job advertisements led to an even greater expansion of access for job seekers and hiring organizations. Online job postings drastically reduce recruiting costs for employers, remove geographical constraints, and allow for more detail in job descriptions (Carnevale et al., 2014). Today, up to 70% of all job openings are posted on the internet, with positions that require a bachelor's degree or higher and those in STEM occupations especially likely to be posted online (Carnevale et al., 2014).

2.2.1 Job Advertisement Content

There is substantial evidence that the information companies share in recruiting materials influences students' views of the organizations, especially since studies assessing individuals' perceptions often employ college student samples (Acarlar and Bilgic, 2013; Avery et al., 2013; Casper et al., 2013; Schmidt et al., 2015; Walker et al., 2011, 2012).

For example, corporate websites and brochures that signal diversity values have been found to more effectively recruit students who also value diversity (Avery et al., 2013), as well as candidates who hold racially minoritized identities (Walker et al., 2011, 2012).

Job advertisements, in particular, can serve as an important source of information about positions, occupations, organizations, and industries for students and job seekers alike (Acarlar and Bilgic, 2013; Carnevale et al., 2014; Schmidt et al., 2015; Wille and Derous, 2017). Job ads vary in structure and content but tend to contain information about industry, occupation, salary, and required education and skills (Carnevale et al., 2014). In a study of electrical and electronics engineering students' reactions to job advertisements, Acarlar and Bilgic (2013) found that students preferred job ads that contained more information rather than less, rating ads that contained information about compensation, benefits, and organizational culture as more credible and satisfactory than those that only featured information about responsibilities associated with the position. Job ad content may be especially important in high-demand industries where qualified applicants might be more discerning, such as engineering (Schmidt et al., 2015).

2.2.2 Diversity in Job Advertisements

A variety of diversity signals in job ads can also attract candidates that encompass a broader array of racial, ethnic, and gender identities. In an analysis of faculty hiring, Smith et al. (2004) found that diversity indicators in job ads were associated with hiring racially minoritized faculty and women. In Smith and colleagues' study, diversity was signaled through departmental or subfield affiliations relevant to diversity (e.g., African American studies, or race relations in sociology), or via qualification statements indicating diversity (e.g., "engender a climate that values and uses diversity," p. 138). Ads where diversity was directly relevant to job responsibilities were more effective than ads containing general statements related to diversity (Smith et al., 2004). Others have argued that faculty job descriptions may normalize and protect whiteness when diversity is uncritically added to hiring calls (Sensoy and DiAngelo, 2017). Notably, in a study of job ads for college graduates, Rios and colleagues (2020) unveiled the fact that fewer than 1% (of 141,941 total ads) called for skills related to working with or learning from individuals with diverse backgrounds and identity facets.

In addition to broad diversity signals like those described above, many job ads may contain EEO statements to signal legal compliance with federal policy. However, research on these statements has also produced mixed results. McNab and Johnston (2002) found that candidates tended to prefer ads with EEO statements, with more extensive EEO statements appealing to women. In contrast, Leibbrant and List (2018) found that EEO statements dampened the interest of racially minoritized candidates, as such candidates tended to see these statements as regulatory and likely to produce tokenism in hiring.

As a whole, gendered and racialized discourses that uphold existing hegemonic structures are pervasive (Jiwani and Richardson, 2011; Lazar, 2007), perhaps especially in formal documents (such as job ads) and in historically exclusionary fields (such

as engineering). Two examples help visualize how this may be the case. Gaucher et al. (2011) and Parson (2016) examined job ads and course syllabi, respectively, and both examined discourse that implicitly reinforced gendered roles and existing power structures. Through experimental design, Gaucher and colleagues found that job ads in men-dominated professions contained more stereotypically masculine words (e.g., active, aggressive, ambitious, decisive) than ads for women-dominated professions. Importantly, discourse mattered; women reading ads with more masculine words, regardless of industry and profession, found the positions less appealing and anticipated a lower sense of belonging in these roles (Gaucher et al., 2011). Turning to a study of STEM course syllabi, Parson used feminist critical discourse analysis to investigate language and linguistic tools (e.g., interdiscursivity, nominative personal pronouns) that reinforced dominant knowledge structures and positivist paradigms in STEM. Defining knowledge as static rather than dynamic may be especially prohibitive to students who have faced institutional barriers in STEM, such as women and femme-identifying students and racially minoritized students. Given these and other findings, we set out to critically examine how internship ads in engineering may also be a mechanism of hegemonic discourse, thus perhaps signaling probable success to those with systemic privilege and impossibility to those who have been systemically minoritized.

3. THEORETICAL FRAMEWORK

This study is guided by signaling theory (Spence, 1973; Stiglitz, 2000) and feminist critical discourse analysis (CDA) (Lazar, 2007). Using these theoretical and epistemological perspectives, we interpreted the cues that companies provided in their internship advertisements about equity and opportunity. In addition, we leveraged this framework to explicitly interrogate the discursive ways that companies may uphold gendered and racialized hegemony and culture in their internship ads. Thus, while signaling theory serves as a basis for understanding how (and why) organizations communicate their values to an external audience, feminist CDA allows for a more critical, equity-focused investigation of the nature of these signals.

3.1 Signaling Theory

Signaling theory focuses on how information is communicated about an individual or organization in the absence of observed information (Connelly et al., 2011). Derived from the field of economics, signaling theory originated as a way to explain how job applicants conveyed their skills to prospective employers via language in resumes, with employers relying on informational signals to make hiring decisions (Spence, 1973). Signaling theory also explains organizational behavior, including how organizations signal their values to potential employees (Stiglitz, 2000). Job seekers rely on available information about a company in their decision to apply, including information available in job advertisements (Schmidt et al., 2015). Notably, job ads help candidates assess opportunities and cultures where their identities will be affirmed (Avery et al., 2013). Sig-

nals in job ads may be particularly crucial in competitive markets, such as engineering, and in cases where a consumer lacks information, which is often the case among college students exploring career options (Sampson et al., 2004). In such cases, corporate signals display an organization's characteristics and brand (Rivera, 2015; Stiglitz, 2000).

3.2 Feminist Critical Discourse Analysis

While signaling theory alludes to company strategies used to communicate their value to prospective applicants, applying a framework of feminist CDA allows us to probe more deeply into the role that language and linguistic tools (e.g., clauses, nominative personal pronouns, interactions among discourses) play in sustaining power and inequity in engineering internship contexts. Feminist CDA reveals how gendered assumptions and power relations are discursively produced and sustained in a given context (Lazar, 2007, 2014). The principles of feminist CDA are influenced by a "feminist political imagination" (Bell, 1999) and radically (re)imagine social change, distinguishing feminist CDA from traditional CDA approaches. According to Lazar (2007, 2014), feminist CDA is comprised of five primary principles: feminist analytical activism (the direct relationship and implications toward advancing accountability of linguistics and social transformation), gender as an ideological structure, the complexity of gender and power relations, discourse in the (de)construction of gender, and critical reflexivity as a practice.

A feminist CDA approach is motivated by the recognition of gendered patterns and hegemony as well as the need to change the conditions of these hierarchical relationships—accordingly, these motivations underscore our interest and approach to this research topic. Yet, as Lazar (2014) notes, gender does not operate as an isolated social category, and patriarchal oppressions often intersect with other systems and structures of power such as race and racism. That is, while we came to feminist CDA largely because of our lived experiences with sexism, we also aimed to interrogate how notions of power in discourse may uphold whiteness, recognizing that we are invested in dismantling and decentering whiteness while, as white scholars, we simultaneously benefit from the structures that whiteness maintains.

3.3 Authors' Positionalities

Feminist CDA's orientation to praxis and hegemony makes it imperative that we acknowledge our positionality in this work (Lazar, 2007; Mullet, 2018). As co-authors, we engaged in self-reflexivity to grapple with how our values and social positions—particularly our positions in gendered and racialized social orders and organizations—influence this work. We both identify as cisgender white scholars in the United States, which are privileged identities frequently associated with academic ethnocentric ideas and practices that must be critically examined by feminist researchers (Lazar, 2007). Additionally, we both identify as relatively young women scholars within academia and disciplinary outsiders to engineering—identities we also reflected on throughout this work as we shaped our interpretations.

We were first inspired to conduct these analyses by reading Parson's (2016) research on professors' gendered language in STEM syllabi, and we wondered how other individuals holding power in students' academic and career trajectories (i.e., internship coordinators or managers) may or may not engage in similar discourses. In light of both authors' experiences as higher education practitioners and researchers who have witnessed and empirically investigated patterns of inequity, we chose to examine discourse and language within internship ads through a transformative feminist paradigm. The first author worked in graduate school admissions for medical and health sciences programs. The second author worked in career services for STEM students and has helped engineering employers shape internship recruiting strategies that would appeal to students with diverse identities. Our professional experiences motivated us to treat these analyses as activism (see Lazar, 2007, 2014), interrogate current practices, and identify opportunities for social change.

3.4 Protection of Vulnerable Populations

Because this study uses publicly available internship advertisements from corporations, we do not believe that our sample requires protection of vulnerable populations.

4. METHODS

To address the research question in accordance with our theoretical framework, we employed document analysis (Bowen, 2009) on a corpus of online engineering internship advertisements. Document analysis is a process of selecting, appraising, and synthesizing data (excerpts, quotations, and passages) within pre-existing documents and then organizing data into major themes (Bowen, 2009). To analyze data through document analysis, researchers follow a process of reviewing data superficially, conducting a thorough reading, and interpreting data to construct categories that generate themes pertinent to the research question. Leveraging our use of a feminist CDA framework, we paid special attention to the discursive tools that ads used to communicate power and inequity in engineering internship contexts—signals that may perpetuate gendered and/or racialized environments for interns.

4.1 Data Collection

Our data come from internship advertisements on Google for Jobs, a Google-owned search engine featuring job ads from various job boards and websites, including LinkedIn, Monster, WayUp, DirectEmployers, CareerBuilder, and Facebook (Zakrasek, 2017). Google for Jobs is free and publicly available, allowing job seekers to set parameters for their search. To identify a corpus of internship ads widely available to undergraduate engineering students, we filtered for location: "United States," required education: "some college," and used the search term "engineering internship." Our search was conducted on May 28, 2020, and elicited 129 internship position advertisements. Ad content was

saved and reformatted into individual documents. After an initial review, we removed duplicates and ads that exclusively preferred a graduate degree to focus our analysis on ads that undergraduate students would consider.

The final dataset included 122 internship ads, and Table 1 contains summary information about the companies represented in the sample. Ads were for positions spread across the United States, with western and southern regions as the two most common geographic locations. Four ads were for remote internship opportunities, although none specified that this was a result of the COVID-19 pandemic. Two ads were for unpaid roles, including one with a small startup organization and another with a county govern-

TABLE 1: Company characteristics (n = 122)

	n	**%**
Region		
Midwest	18	14.8
Northeast	24	19.7
South	34	27.9
West	42	34.4
Unspecified	4	3.3
Company size		
Under 50 (small)	20	16.4
51–1,000 (moderate)	20	16.4
1,001–10,000 (large)	14	11.5
10,001+ (very large)	68	55.7
Industry		
Automotive	9	7.4
Aviation and aerospace	14	11.5
Civil engineering and construction	26	21.3
Computer software and information technology	20	16.4
Consumer goods and retail	7	5.7
Electronics manufacturing and semiconductors	6	4.9
Finance and management consulting	4	3.3
Food and wine production	7	5.7
Government and maritime	7	5.7
Healthcare and medical devices	2	1.6
Industrial automation and machinery	12	9.8
Environment and utilities	8	6.6

Note: Industry information was collected from company pages on LinkedIn. Companies represented 36 industry categories, which we further condensed into the 12 categories above.

ment, with one additional ad (for a startup) stating that a small stipend may be available. The majority of sponsoring companies employed over 10,000 people, but some smaller companies (e.g., startups) employed fewer than 50 individuals. Further, while companies represented a wide range of industries, most companies specialized in civil engineering, construction, or computer software and information technology (IT) sectors.

Table 2 further displays educational characteristics that employers sought among intern candidates. The majority of ads in our corpus sought interns enrolled in college, with some ads providing additional education requirements. Intern ads listed a wide range of engineering majors of interest, with mechanical engineering and civil engineering as the most-sought fields.

4.2 Data Analysis

After compiling our corpus of data, the first author uploaded all internship advertisements into Dedoose, an online software for qualitative analysis. Following Bowen (2009), we first conducted a preliminary read, and then, following Smith et al. (2004), we decided to code internship ads into six distinct sections for analysis: position title, company description, position summary and responsibilities, qualifications (subdivided into required and preferred), and equal employment opportunity (EEO) statements. We

TABLE 2: Company requirements for intern (n = 122)

Characteristics	***n***	**%**
Education level required		
High school degree	2	1.6
Enrolled in college, general[a]	58	47.5
Minimum one year of college completed	15	12.3
Minimum two years of college completed[b]	12	9.8
Minimum three years of college completed	5	4.1
Bachelor's degree completed	5	4.1
Unspecified	25	20.5
Engineering major[c]		
Aerospace or aeronautical engineering	5	4.1
Agricultural or biological engineering	4	3.3
Architectural engineering	2	1.6
Automotive engineering	1	0.8
Chemical engineering	11	9.0
Computer engineering	9	7.4
Computer science/software engineering	14	11.5
Construction engineering technology	1	0.8

TABLE 2: (*continued*)

Civil engineering	24	19.7
Design engineering	1	0.8
Electrical engineering	20	16.4
Engineering, unspecified	24	19.7
Engineering management	1	0.8
Engineering mechanics	1	0.8
Environmental engineering	7	5.7
Fire protection engineering	1	0.8
Geological engineering	1	0.8
Hardware engineering	1	0.8
Industrial engineering	9	7.4
Manufacturing engineering	5	4.1
Mechanical engineering	39	32.0
Materials science/engineering	3	2.5
Network engineering	1	0.8
Process engineering	1	0.8
Robotics	1	0.8
Solid waste engineering	1	0.8
Systems engineering	1	0.8

[a] Includes two ads specifying enrollment in an associate's program and another ad that required college enrollment or completion of a software engineering bootcamp program.

[b] Includes one position seeking a graduate of an associate's degree program.

[c] Majors exceed the number of ads because many ads listed more than one required or preferred major. Ads that did not specify any major are excluded (n = 25). Non-engineering majors listed in job ads included architecture, biology, business management, chemistry, construction or construction management, environmental science, geology, information systems, manufacturing industrial technology, math, physical sciences, physics, polymer chemistry, and transportation.

then downloaded and organized EEO statements in a spreadsheet, with columns indicating the different protections that EEO statements explicitly mentioned. The first author then conducted a secondary read of ads for diversity-related statements that existed outside of the EEO statement, adding these statements to our spreadsheet for analysis. Next, the first author analyzed EEO and diversity statements, exploring these statements for breadth (i.e., length), depth (i.e., level of detail), and linguistic tools signaling varying elements of equity, diversity, and inclusivity (or exclusivity).

As a second cycle of coding, the first author coded each ad for the use of nominative personal pronouns: "you," "we," and "our," guided by Parson (2016). Like Parson, we argue that pronouns can be an important reflection of power in discourse. Given that a primary goal of feminist CDA is to critically examine how power structures are upheld, even in subtle and covert ways (Lazar, 2014), we were interested in examining

if and how pronouns (as linguistic tools) signaled power implicit in the presentation of opportunities, especially in how companies articulate their values and intern roles. The first author identified excerpts containing nominative personal pronouns, reading each excerpt multiple times to understand the discourse represented by the pronoun, how the pronoun was used, the language and action the pronoun was describing, and the ways that pronouns indicated (or subverted) responsibility, agency, or power. While reading, the first author also wrote analytic memos to indicate how specific words and turns of phrase communicated details about internships. Finally, the first author re-reviewed all internship ads and analytic memos to understand interdiscursivity (Fairclough, 1992; Lazar, 2007).

4.3 Trustworthiness

CDA recognizes knowledge as socially constructed, and interpretation is shaped by a researcher's experience and lens (Mullet, 2018). To promote trustworthiness in CDA, it is necessary that researchers maintain transparency of analytic processes and substantiate claims with evidence (Greckhamer and Cilesiz, 2014) while also engaging in triangulation processes (Mullet, 2018). While analyses were led by the first author to maintain consistency, both authors initially reviewed a subset of the ads to pilot coding processes and identify key areas of interest to our analysis. Throughout the analytic process, the first author shared coded excerpts, analytic memos, and interpretations with the second author. The second author reviewed materials after both stages of analysis, confirming accuracy of interpretations and probing for challenges or disconfirming data. As a team, we regularly engaged in peer debriefing to discuss questions or persisting struggles with emergent findings and resolve our perceptions of how the current stages of analysis, together, constructed reality for internship candidates (Greckhamer and Cilesiz, 2014).

5. FINDINGS

Using signaling theory and feminist CDA, we explored how different discourses and linguistic features signaled power and organizational ideology concerning gender and racial equity efforts. Given our application of feminist CDA, it is important to recognize that the present findings are interpreted from our standpoint as white women scholars invested in furthering equity efforts. Below, we discuss whether and how companies signal equity-oriented ideological stances through three themes: 1) explicit organizational statements, 2) self-promotion of company values, and 3) positioning of intern agency.

5.1 Explicit Organizational Statements

Of the 122 internship advertisements included in this study, 50.8% (n = 62) of ads included (to varying levels of specificity) statements about EEO policies. An additional 17 ads mentioned commitments to diversity or inclusion but did not include specific EEO statements, while 22 ads included both an EEO and a diversity-related clause (e.g.,

"Join a workplace that values diversity in thought, integrity, and teamwork" [Promaxo]). Across ads, explicit uses of "diversity" or "diverse" were more common (34.4% of ads, $n = 42$) than "inclusion" or "inclusive" (18.9%; $n = 23$). Irrelevant uses of these terms (e.g., "data for inclusion in reports") were not included in these counts. For the most part, use of these terms overlapped; only five ads (4.1%) mentioned inclusion without referencing diversity. Notably, no companies used the term "equity," and we also observed no verbiage such as "equality," "justice," or "accessibility." While general statements about diversity were interspersed throughout ads, EEO statements were nearly always located at the end of the ad, often with a discerning header or distinct introductory language such as "As an Equal Opportunity Employer, we…" and positioned the company as compliant with laws that prohibited employee discrimination.

The presence of EEO statements was not surprising. However, companies diverged in how they described commitments to nondiscriminatory practices and the extent to which these statements were supplemented with signals of diverse and inclusive cultures. For example, several companies provided short EEO statements, simply stating that the company was an equal opportunity employer. About half of ads that included an EEO statement used more standardized language that listed protected identities specified by the U.S. Equal Employment Opportunity Commission (as discussed in the literature review).

When attending specifically to language around gender and race, we found substantial variation in language discussing gender, with many ads using several terms in a single statement. Across the 62 ads using EEO statements, companies indicated that nondiscrimination policies applied without regard to an applicant's "gender" ($n = 18$) or "gender identity" ($n = 36$), and three ads invited "women" to apply. Seven ads used both "gender" and "gender identity," whereas other ads used terms independently. Six companies extended their descriptor of "gender identity" by saying that nondiscriminatory policies applied without regard to "gender identity or expression," language that may signal greater inclusion for trans* and non-binary prospective interns. Further, five ads explicitly stated that nondiscriminatory policies applied regardless of pregnancy or family structure/responsibilities. While our focus relates to the social construction of gender identity, some EEO statements also relied on biological descriptors, using "sex" ($n = 33$) or specifying that companies employed "females" ($n = 14$, sometimes abbreviated to "F"). Language concerning candidates' racial identities demonstrated a strong reliance on the terms "race" ($n = 42$) and "color" ($n = 40$), which are both terms explicated by the U.S. Equal Employment Opportunity Commission. However, six ads relied on the vague language of "minorities" and implied a connection to prospective applicants' race or ethnicity by more specifically naming other minoritized groups such as women, veterans, and persons with disabilities. The use of such vague language may send concerning signals of racial minoritization to prospective applicants, implicitly upholding whiteness as the norm.

While EEO statements mostly followed conventions of listing compliance and protected classes, some ads employed EEO statement language that provided more nuanced insight into company values regarding diversity and inclusion. Phrases such as

"We're an EOE (i.e., equal opportunity employer) that empowers our people" (Booz Allen Hamilton), "Tetra Tech is committed to creating a diverse environment" (Tetra Tech), and "We champion for equal representation in STEM careers…" (FormFactor) accompanied several EEO statements, providing insight into company values that extend beyond basic legal compliance. Although phrases about diversity were only found in a handful of EEO statements, nearly one-fifth of job descriptions included additional diversity-related clauses beyond the EEO statement. AECOM, a large organization responsible for several job ads in our sample, offered one of the most descriptive diversity statements, encouraging candidates to "imagine working on rewarding projects within a diverse culture… [and in] a company culture that champions inclusion." More commonly, however, ads used shorter value-oriented language associated with the benefits of "a diverse team" (Anyscale) without defining what "diverse" means. Ultimately, the rare utility of descriptive statements about diversity and inclusion across ads—and the even more sparsely provided rationale supporting this language—leads us to believe that companies included such discourse with rather surface-level rationale, providing applicants relatively little assurance that company practices embody these values.

5.2 Self-Promotion of Company Values

In addition to the cues of (in)equity from explicit organizational statements, language within internship ads frequently indicated companies' self-promotion of their values. Results revealed that companies engaged the pronouns "our" and "we" as collective pronouns and linguistic tools in ads—tools that generated cues about the shared nature of the company environment, reputation, and values. Some employers leveraged collective language to signal desirable character traits in a potential intern, while situating these traits as larger cultural values of the company. For example, Datadog stated, "**our** engineering culture values pragmatism, honesty, and simplicity to solve hard problems the right way." General Dynamics engaged in similar language while explicating how their values translated to the work environment, conveying, "Given the nature of **our** work and who **we** are, **we** value trust, honesty, alignment and transparency. **We** offer highly competitive benefits and pride **ourselves** in being a great place to work with a shared sense of purpose." In both of these statements, advertisements use collective language—specifically exhibited through pronouns—to display how the company culture promotes specific values; in turn, this language may signal organizational priorities to potential interns.

While companies' language and reliance on plural pronouns generally illuminated a collective discourse that has the potential to send cues about the nature of inclusion, direct language addressing diversity and descriptions of "diversity" were often vague. Two companies used phrases such as "**we** believe in diversity" (Arcadis) and "**Our** team of outstanding professionals is focused on performance, thought leadership, innovation, and the power of ideas that come from a diverse and inclusive workforce" (Exelon). The lack of effort to define "diverse," "diversity," and "inclusive" in such statements provides little more than elusive hints as to how interns with minoritized gender and racial

identities might be valued. Indeed, interpreted through a feminist lens, the scarcity of language directly connecting company values to diversity might send a signal of performativity to interns that equity efforts exist only as surface-level commitments.

Finally, in more covert ways, the use of collective language also sends opaque signals about power and responsibility for upholding values of diversity and equity at sponsoring companies. Within these internship advertisements, "we" was frequently used in an elusive, royal sense that subverted ownership for the named conditions and culture. In our view, using "we" broadly may leave interns questioning company power structures. Pentair was one of few companies that began to specify their actions toward fostering a "diverse" work setting: "**We** take ongoing action to improve the diversity of **our** workforce by: ensuring leadership involvement and ownership; attracting and retaining diverse talent at all levels; fostering a globally aware, inclusive culture; ensuring **our** practices are fair and non-discriminatory." While this language goes further than other ads in defining company strategies in the interest of promoting diversity, collective pronouns leave the actors unclear and invisible. While "we" could indicate actions of solidarity in practice, it is vital to recognize that nondiscriminatory practices are nearly always crafted and upheld by company leaders, not interns—a reality that contradicts the implied collective nature of "we" in supporting diversity-oriented practices. Defining diversity-oriented practices may be one step toward signaling company practices and values related to diversity, but the ambiguous placement of power fails to name those who hold responsibility for inclusive action and change.

5.3 Positioning of Intern Agency

Internship advertisements also spent considerable real estate discussing what skills and responsibilities a potential intern should bring or fulfill at the sponsoring company. Discourse about the intern's role was often linguistically represented by the use of the pronoun "you," with information dispersed throughout several sections of each ad. Often, companies employed the word "you" to set expectations, clarify an intern's "fit" within an organization, and articulate intern tasks. However, internship ads diverged in how they used "you" to signal interns' agency (or lack thereof), which has important implications for how potential interns—particularly interns whose identities are not systemically privileged in terms of gendered and racialized power structures—might interpret workplace power dynamics and socialization.

When companies described how interns may anticipate operating in a team or company culture, agency was signaled through the use of active language. Cambly provided an illustrative example of such active language, noting, "**you'll** be part of a small and fast-moving engineering team where **you'll** have a large impact." Here, Cambly's ad used linguistic tools to designate the intern's role in a team and their power in shaping the company environment. Occasionally, ads took a more radical approach to conveying agentic possibilities in company culture, shown by phrases like "We have an open and flexible environment to allow **you** to push boundaries" (Daimler). Yet, without stating

what types of power interns might have to "push boundaries" and set company dynamics, this language may uphold unrealistic expectations of equal opportunity. More often, ads relied on language describing how interns would receive guidance, which paints a picture more closely aligned with socialization than one of cultural change. For instance, phrases such as "If who **we** are and what **we** do resonates with **you**…" (General Dynamics Mission Systems) speak to the negotiation of power within the workplace, suggesting limited intern agency and the expectation that interns socialize to company norms and existing culture.

More frequently, ads signaled intern agency when discussing skill-based responsibilities. Tesla, for example, stated, "Instead of going on coffee runs and making copies, **you'll** be seated at the table making critical decisions that will influence not only **your** team, but the overall achievement of Tesla's mission." General Dynamics also wrote, "Rather than being a 'cookbook' project, **you** will help define the parameters of the project and lead its execution." While agentic language is notable, the comparisons to "coffee runs" and "cookbook project" raised questions about inequitable internship stereotypes with implicitly gendered or racialized associations. Defining the intern's role as "at the table," and contrasting intern responsibilities to "coffee runs" and "making copies" denigrates administrative responsibilities—roles historically held by women and People of Color—to assure applicants that their intellectual contributions will be valued by their team and company, unlike administrative work. Similarly, "cookbook project" ostensibly promotes the intellectual value of the internship experience by contrasting the intern's work to that of a subordinate individual who is following explicit directions, as a cook (again, often a gendered and racialized role) would do by following a recipe. Here, the use of comparisons represented an organizational power tactic, implicitly signaling some companies' internships to be more meaningful than others while raising epistemological questions about why advertisements by at least two companies made comparisons that implicitly devalued historically gendered and racialized labor.

The passive or active linguistic tools that companies used also revealed a divergence in power and agency. For example, Sanmina stated, "If **you** think **you're** the right candidate for our team, then let's talk!" Here, the use of "you" placed the onus on the student to assess their potential at the company, alluding to a false sense of agency, given this statement's implicit reminder that candidates should screen themselves and that the company has the final power in selecting the "right candidate." Other times, "you" referred to agentic power by saying that the intern could have many opportunities and, to some extent, find their own niche; yet, again, such statements did not acknowledge that companies ultimately control the opportunities from which interns may "choose." In contrast to active language, Mantle stated, "The environment includes other senior engineers willing to help mentor and guide **you**." In this case, "you" passively signaled company power, indicating that the intern would be in a receiving role. Importantly, when "you" was used passively, this language indicated a high level of support and mentorship for the intern, which may appeal to students who are systemically minoritized in the field.

6. DISCUSSION AND IMPLICATIONS

Using a corpus of college internship advertisements in engineering, this study develops a deeper understanding of equity-oriented signals that companies explicitly or implicitly provide via organizational statements and linguistic tools. With the understanding that internships are largely positioned as workforce socialization experiences and that discourses within job ads often serve to signal company culture, our findings suggest that while many ads acknowledge diversity values, these cues are varied and ill-defined, largely promoting existing structures. Thus, findings from this study illustrate the ways that internship job ads—perhaps a student's first point of access to professional opportunities—perpetuate the gendered and raced status quo in engineering, promoting socialization to an industry that has historically suppressed the entry and success of individuals who hold one or more systemically minoritized social identities.

Within our sample, just half of ads included EEO statements, with other ads articulating diversity values in alternative ways. During analysis, we were struck by the term "equal employment opportunity" itself—this term implies that legal compliance to nondiscriminatory practices results in equal opportunity for applicants. Liberal pluralism, or the idea that everyone has an equal chance to be successful in the United States, is a construct rooted in hegemonic whiteness, and this ideology is perpetuated through discourse (Putman, 2017). In reality, access to opportunities is not equal, especially in a field where women and femme-identifying individuals as well as individuals who identify as Black, Indigenous, and as People of Color are consistently and systemically minoritized. Thus, perhaps it is unsurprising that existing research suggests some applicants see EEO statements as perpetuating tokenism in hiring (Leibbrandt and List, 2018).

Despite the legal foundations of EEO statements, there was no standardization of these statements aside from their consistent location at the bottom of ads. Many ads did not include EEO language at all, with a subset of ads instead acknowledging diversity in a way that was embedded within the text. While this represented a small fraction of ads, embedded references to diversity and inclusion were more common in our data corpus than the 1% previously illustrated (Rios et al., 2020). Still, only a few ads explicitly referenced diversity, and even fewer referenced inclusion or inclusivity. Language within EEO statements varied; we saw significant differences in the ways that organizations described their "equal employment" practices. Turning to prior literature, McNab and Johnston (2002) found that more detailed EEO statements may feel more genuine to prospective applicants, and to us this was certainly the case. Statements that acknowledged various identity facets such as gender identity, pregnancy, or ethnicity, for example, felt more genuine compared to statements that simply read "M/F" (in reference to inviting both male and female candidates to apply) or "minorities." More detailed language around diversity may not only serve to signal acceptance but may also demonstrate greater thoughtfulness around how diversity is defined and prioritized within hiring. Companies may also benefit from detailing values, efforts, and the rationale behind diversity-oriented or inclusive actions, moving beyond simple buzz words. The absence

of terms such as equity, accessibility, justice, and even equality was salient, suggesting great opportunity for improved practice.

From a feminist CDA lens, discursive references to diversity values or equal hiring that are not backed by action-oriented statements of practice may be performative in nature (Lazar, 2007). Often, references to diversity in ads were general, and the lack of specificity suggests a more performative statement compared to statements that indicated how diversity values would be enacted. Specifically, the performative side of companies' values became clear when the same ad employed language (via nominative personal pronouns) to indicate that interns should adapt to the environment. We found this to be the case several times, particularly when the discourses of the company and the intern were competing in the same clause. Additionally, a royal "we" pronoun was often used to state diversity or inclusion-related values but failed to specify how efforts might be realized, by whom these efforts would be sustained, and for whom these efforts may serve. This finding aligns with literature that has documented the elusive power dynamics conveyed in the pronoun "we" (Baecker, 1998; Parson, 2016). Collectively, our findings suggest that, even when companies state diversity values in their internship ads, they may not signal a willingness to disrupt the dominance of whiteness and patriarchal values that maintain oppressive environments in the engineering workplace.

Across internship ads, nominative personal pronouns were often used to communicate hierarchy, with "our" serving as a hegemonic indicator—one which may have polarizing effects on the recruitment of systemically minoritized interns. On the one hand, if companies use "our" to indicate communally oriented goals that position the company and intern as having a societal impact, this may extend how prior research has conceptualized "feminine" language as being more collectivist in nature (Gaucher et al., 2011). Conversely, if "our" has too much of a dominating presence, this language may blur prospective interns' understanding of where their personal role fits in such statements, which mirrors the blurred responsibility conveyed by ambiguous language in undergraduate STEM course requirements (Parson, 2016). With gender and racial minoritization in engineering academic settings already influencing students' outcomes in the field (Neumann et al., 2016; Strayhorn and Johnson, 2016; Woodcock and Bairaktarova, 2015), language that reinforces power structures or articulates that prospective applicants must decide whether they fit into the existing culture may serve to further hinder equity in engineering opportunities.

Additionally, signaling theory describes how organizational cues (including language in job ads) are crucial in competitive markets and when the receiver holds limited information (Stiglitz, 2000), which is a common scenario for college students examining career possibilities (Parks-Yancy, 2012; Sampson et al., 2004; Tate et al., 2015). Internships represent a key socialization opportunity for undergraduates (Dailey, 2016; Hora et al., 2020); yet students depend on available resources to build their knowledge. As others have asserted, we posit that internship job ads serve as a means for students to learn about a company and associated opportunities (Acarlar and Bilgic, 2013; Carnevale et al., 2014; Schmidt et al., 2015; Wille and Derous, 2017). However,

ads contain important cues about fit and belonging that can impact students' interest in the field (Avery et al., 2013; Gaucher et al., 2011; Walker et al., 2011, 2012), and the results of the current study reveal how cues about structures of power and (in)equity may be upheld through language and linguistic tools. The impact of such signals is highly dependent on the way they are communicated (Leibbrandt and List, 2018; McNab and Johnston, 2002; Smith et al., 2004), underscoring the importance of applying research to practice.

6.1 Implications for Practice

Drawing from the present findings and our feminist perspective, we suggest that internship coordinators and managers should be more mindful of the language they use in internship ads, paying careful attention to how language may either signal commitment or subvert responsibility for supporting equitable professional practices and cultures in engineering. Feminist CDA acknowledges the relationship between language and gendered power structures, with a need to change both in a larger movement toward social equity. Broadly, accepted discourses tend to be masculine and rooted in whiteness, which can silence, exclude, and systemically minoritize individuals due to their gender or racial identities (Lazar, 2014; Jiwani and Richardson, 2011; Putman, 2017), perhaps especially in an industry where such inequities are widespread. While we focus on discourse, the first principle of feminist CDA articulates the direct relationship between linguistics and social transformation. Thus, while we make practical recommendations based on our analysis, discursive changes should not and cannot be made separate from structural commitments to creating a workplace culture that is welcoming to and supportive of women and femme-identifying individuals and to those who identify as Black, Indigenous, and as People of Color.

Companies can construct internship advertisements as tools that counter gatekeeping practices in engineering, which are historically rooted in "talent and eligibility" standards that maintain unjust structures of whiteness and meritocracy (Slaton, 2010). One way that companies may begin to enact this work is by using more detailed, concrete language about equity-oriented initiatives. Given that existing research documents mixed opinions about the utility of EEO statements (Leibbrandt and List, 2018; McNab and Johnston, 2002), companies may consider ways to embed their commitments to equity throughout advertisements. Articulating concrete ways that company leaders establish an equitable work environment may serve to signal a stronger commitment to social justice, especially considering that student audiences may prefer more detailed descriptions as they socialize to the field (Acarlar and Bilgic, 2013). It is necessary for companies to name specific identity facets, culturally relevant values, and active practices that promote the success of individuals who hold individual and intersecting minoritized identities in the field, rather than general allusions to diverse practices; without such, the dominant industry discourses that have maintained inequality in engineering will not be disrupted.

Beyond explicit statements relevant to equity-oriented values and practices, companies must also think critically about implicit language that perpetuates existing power inequities. Companies hiring engineering interns should partner with collegiate career services professionals to refine intern ad language, perhaps even hosting focus groups about engineering internship considerations with women and femme-identifying students as well as students who identify as Black, Indigenous, and as Students of Color. Soliciting student perspectives on position advertisement language may be important given the different ways that students and organizations conceptualize internship experiences (Hora et al., 2020). To espouse a feminist critical approach to their discourse, human resources professionals can adopt Lazar's (2007) suggestions about social transformation and work alongside the populations that are represented by language to better center their experiences and perspectives.

6.2 Limitations and Implications for Future Research

While this exploratory work reveals disparities in discourse across engineering internship ads, we note several limitations and opportunities for future research. In particular, we only studied discourse, not practice. While the two are often intrinsically linked—and must be in order to promote true transformation and more equitable practice (Lazar, 2007)—our analyses focused only on company signals, not company structures or behaviors. It is quite possible that companies discussing diversity in detail and using inclusive language in ads do not actually have structures or practices that promote this equity and success. In contrast, companies with abbreviated job descriptions that do not reference diversity, or those that discuss adherence to existing and problematic power structures may, in actuality, have practices that support the success of systemically minoritized individuals. As understanding company practices extends beyond the scope of our analysis, our findings only represent discursive signals in ads. Yet, we study language because these are the signals that students also encounter when searching for internships, and such cues matter.

According to NACE (2020), employers often begin recruiting for internships eight months prior to the start date, typically in the fall for summer internships. Because we collected data in May 2020, our sample may not reflect positions posted on average recruiting timelines. It is also the case that our data collection and analyses occurred shortly after the murder of George Floyd and prominent Black Lives Matter demonstrations throughout the summer of 2020, especially in the United States. The specific sociohistorical moment at which these ads were collated offers a unique window of insight at a critical moment prior to company statements (or silence) regarding their support for Black Lives Matter. As such, scholars may consider replicating these research efforts with a new sample in the future, as it is important to know whether and how engineering companies may have altered their discourse within internship ads following this point in time. This study also took place during the COVID-19 pandemic, and available ads may have been constrained by geography or economic conditions. Further, because Google for Jobs compiles ads from other sources, some ads directed readers to company

websites for more information. However, while some ads on Google for Jobs contain abbreviated content, we posit that students may use this site to search for internships and review similar information to gauge interest.

There are many opportunities to expand on this work, both from an organizational and student-centered lens. First, to elucidate specific information about disciplines, scholars may consider separately analyzing ads by engineering industries, as the discourses of civil and software engineering internships, for example, may differ. Ads for internship positions in civil engineering, construction, and computer software and IT were overrepresented in our sample, and these disciplines tend to have the most severe underrepresentation of women and racially minoritized groups (NCES, 2019; NSB and NSF, 2014). While discursive differences by subfield extend beyond the scope of our analysis, future scholars may conduct more specific analyses to better capture disciplinary and/or industry contexts.

Next, while diversity-oriented language in ads, or lack thereof, may at times facilitate our understanding of companies' rationale for including such language, much remains to be learned about how companies interpret the importance of including explicit language about diversity, equity, and inclusion. It would be useful for researchers to interview both human resources professionals and company leaders that write internship ads, as understanding the human perspective underlying these discourses may uncover insights in their rationale for including language about diversity, equity, and inclusion in ads and possibilities for change agents to promote social equity. From a student perspective, researchers should consider centering the experiences of students with minoritized gender and racial identities as they search for engineering internships—perhaps through the use of focus groups—and explore how ads or recruitment steps influence their trajectories.

7. CONCLUSION

Drawing from 122 advertisements for college engineering internships, this study explored companies' language and linguistic tools in ads. Within a framework of signaling theory and feminist CDA, we focused on organizational statements of equal employment and diversity as well as (implicitly gendered and racialized) power structures signaled by linguistic tools, especially in descriptions of organizational values and intern role and agency. Findings reveal a lack of specificity in companies' explicit statements, suggesting that "diversity" language evades identifying concrete equity efforts. Results also indicate that nominative personal pronouns used in a royal sense, such as "we," subvert the naming of responsibility for who creates equitable conditions. By leaving inclusive practices and power structures unnamed, ads may be signaling a performative commitment to equity.

ACKNOWLEDGMENT

We are thankful for the constructive feedback and support of the editorial team and reviewers for *JWMSE*.

REFERENCES

Acarlar, G., & Bilgiç, R. (2013). Factors influencing applicant willingness to apply for the advertised job opening: The mediational role of credibility, satisfaction and attraction. *The International Journal of Human Resource Management,* 24(1), 50–77. DOI: 10.1080/09585192.2012.667427

Avery, D. R., Volpone, S. D., Stewart, R. W., Luksyte, A., Hernandez, M., McKay, P. F., & Hebl, M. R. (2013). Examining the draw of diversity: How diversity climate perceptions affect job-pursuit intentions. *Human Resource Management,* 52(2), 175–94. DOI: 10.1002/hrm.21524

Baecker, D. L. (1998). Uncovering the rhetoric of the syllabus. *College Teaching,* 26(2), 58–62.

Bell, V. (1999). *Feminist imagination*. Sage.

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal,* 9(2), 27–8.

Bowleg, L. (2008). When Black + lesbian + woman ≠ Black lesbian woman: The methodological challenges of qualitative and quantitative intersectionality research. *Sex Roles,* 59(5), 312–25.

Carnevale, A. P., Jayasundera, T., & Repnikov, D. (2014). *Understanding online job ads data: A technical report*. Georgetown University, Center on Education and the Workforce. Retrieved from https://cew.georgetown.edu/wp-content/uploads/2014/11/OCLM.Tech_.Web_.pdf.

Casper, W. J., Wayne, J. H., & Manegold, J. G. (2013). Who will we recruit? Targeting deep- and surface-level diversity with human resource policy advertising. *Human Resource Management,* 52(3), 311–32. DOI: 10.1002/hrm.21530

Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling theory: A review and assessment. *Journal of Management,* 37(1), 39–67. DOI: 10.1177/0149206310388419

Dailey, S. L. (2016). What happens before full-time employment? Internships as a mechanism of anticipatory socialization. *Western Journal of Communication,* 80(4), 453–80. DOI: 10.1080/10570314.2016.1159727

Davis, D., & Binder, A. (2016). Selling students: The rise of corporate partnership programs in university career centers. In E. Popp Berman & C. Paradeise (Eds.), *The university under pressure: Research in the sociology of organizations* (Vol. 46, pp. 395–422). Bingley, UK: Emerald.

Dobbin, F., Schrage, D., & Kalev, A. (2015). Rage against the iron cage: The varied effects of bureaucratic personnel reforms on diversity. *American Sociological Review,* 80(5), 1014–44. DOI: 10.1177/0003122415596416

Fairclough, N. (1992). *Discourse and social change*. Cambridge, UK: Polity Press.

Gaucher, D., Friesen, J., & Kay, A. C. (2011). Evidence that gendered wording in job advertisements exists and sustains gender inequality. *Journal of Personality and Social Psychology,* 101(1), 109–28.

Greckhamer, T., & Cilesiz, S. (2014). Rigor, transparency, evidence, and representation in discourse analysis: Challenges and recommendations. *International Journal of Qualitative Methods,* 13, 422–43.

Green, R. D., & Farazmand, F. A. (2012). Experiential learning: The internship and live-case study relationship. *Business Education & Accreditation,* 4(1), 13–23.

Holly, J. (2020). Disentangling engineering education research's anti-Blackness. *Journal of Engineering Education*, 109(4), 629–35. DOI: 10.1002/jee.20364

Hora, M. T., Parrott, R., & Her, P. (2020). How do students conceptualise the college internship experience? Towards a student-centred approach to designing and implementing internships. *Journal of Education and Work,* 33(1), 48–66. DOI: 10.1080/13639080.2019.1708869

Jiwani, Y., & Richardson, J. E. (2011). Discourse, ethnicity and racism. In T. A. van Dijk (Ed.), *Discourse studies: A multidisciplinary introduction* (pp. 241–262). Sage.

Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter*. Association of American Colleges and Universities.

Lazar, M. M. (2007). Feminist critical discourse analysis: Articulating a feminist discourse praxis. *Critical Discourse Studies,* 4(2), 141–64. DOI: 10.1080/17405900701464816

Lazar, M. M. (2014). Feminist critical discourse analysis. In S. Ehrlich, M. Meyerhoff, & J. Holmes (Eds.), *The handbook of language, gender, and sexuality* (pp. 180–200). John Wiley & Sons, Inc.

Leibbrandt, A., & List, J. A. (2018). Do equal employment opportunity statements backfire? Evidence from a natural field experiment on job-entry decisions. *NBER Working Papers* (No. 25035). Retrieved from https://www.nber.org/papers/w25035.pdf.

Marra, R. M., Rodgers, K. A., Shen, D., & Bogue, B. (2009). Women engineering students and self-efficacy: A multi-year, multi-institution study of women engineering student self-efficacy. *Journal of Engineering Education,* 98(1), 27–38. DOI: 10.1002/j.2168-9830.2009.tb01003.x

McHugh, P. P. (2017). The impact of compensation, supervision and work design on internship efficacy: Implications for educators, employers and prospective interns. *Journal of Education and Work,* 30(4), 367–82. DOI: 10.1080/13639080.2016.1181729

McNab, S. M., & Johnston, L. (2002). The impact of equal employment opportunity statements in job advertisements on applicants' perceptions of organizations. *Australian Journal of Psychology,* 54(2), 105–209.

Mullet, D. R. (2018). A general critical discourse analysis framework for educational research. *Journal of Advanced Academics,* 29(2), 116–42. DOI: 10.1177/1932202X18758260

National Association of Colleges and Employers. (2015). *Students in demand: An insight into class of 2015 STEM graduates.* Retrieved from https://www.naceweb.org/uploadedfiles/content/static-assets/downloads/executive-summary/2016-stem-executive-summary.pdf.

National Association of Colleges and Employers. (2018). *Position statement: U.S. internships.* Retrieved from http://www.naceweb.org/about-us/advocacy/position-statements/position-statement-us-internships/.

National Association of Colleges and Employers. (2020). *2020 Internship & co-op survey report: Executive summary.* Retrieved from https://www.naceweb.org/uploadedfiles/files/2020/publication/executive-summary/2020-nace-internship-and-co-op-survey-executive-summary.pdf.

National Center for Education Statistics. (2019). *Table 318.30. Bachelor's, master's, and doctor's degrees conferred by postsecondary institutions, by sex of student and discipline division: 2017–18.* Digest of Education Statistics. Retrieved from https://nces.ed.gov/programs/digest/d19/tables/dt19_318.30.asp.

National Science Board & National Science Foundation. (2014). *Who earns degrees in engineering, and in what subfields?* Retrieved from https://nsf.gov/nsb/sei/edTool/data/engineering-02.html.

Neumann, M. D., Latham, S. A., & Fitzgerald-Riker, M. (2016). Resisting cultural expectations: Women remaining as civil and environment engineering majors. *Journal of Women and Minorities in Science and Engineering,* 22(2), 139–58. DOI: 10.1615/JWomenMinorScienEng.2016013949

Nunley, J. M., Pugh, A., Romero, N., & Seals, R. A., Jr. (2016). College major, internship experience, and employment opportunities: Estimates from a resume audit. *Labour Economics,* 38, 37–46. DOI: 10.1016/j.labeco.2015.11.002

Ong, M., Jaumot-Pascual, N., & Ko, L. T. (2020). Research literature on women of color in undergraduate engineering education: A systematic thematic synthesis. *Journal of Engineering Education*, 109(3), 581–615. DOI: 10.1002/jee.20345

Parks-Yancy, R. (2012). Interactions into opportunities: Career management for low-income, first-generation African American college students. *Journal of College Student Development,* 53(4), 510–23. DOI: 10.1353/csd.2012.0052

Parson, L. (2016). Are STEM syllabi gendered? A feminist critical discourse analysis. *The Qualitative Report,* 21(1), 102–16.

Pawley, A., Mejia, J., & Revelo, R. (2018). *Translating theory on color-blind racism to an engineering education context: Illustrations from the field of engineering education* [Paper presentation]. American Society for Engineering Education Conference, Salt Lake City, UT, United States.

Putman, A. L. (2017). Perpetuation of whiteness ideologies in US college student discourse. *Journal of Intercultural Communication Research*, 46(6), 497–517.

Rios, J. A., Ling, G., Pugh, R., Becker, D., & Bacall, A. (2020). Identifying critical 21st-century skills for workplace success: A content analysis of job advertisements. *Educational Researcher,* 49(2), 80–9. DOI: 10.3102/0013189X19890600

Rivera, L. A. (2015). *Pedigree: How elite students get elite jobs.* Princeton University Press.

Sampson, J. P., Jr., Reardon, R. C., Peterson, G. W., & Lenz, J. G. (2004). *Career counseling and services: A cognitive information processing approach*. New York: Thomson.

Samuelson, C., & Litzler, E. (2013). *Seeing the big picture: The role that undergraduate work experiences can play in the persistence of female engineering undergraduates* [Paper presentation]. American Society for Engineering Education Conference, Atlanta, GA, United States. Retrieved from https://www.asee.org/public/conferences/20/papers/6686/view

Schmidt, J. A., Chapman, D. S., & Jones, D. A. (2015). Does emphasizing different types of person-environment fit in online job ads influence application behavior and applicant quality? Evidence from a field experiment. *Journal of Business and Psychology,* 30, 267–82. DOI: 10.1007/s10869-014-9353-x

Sensoy, Ö., & DiAngelo, R. (2017). "We are all for diversity, but…": How faculty hiring committees reproduce whiteness and practical suggestions for how they can change. *Harvard Educational Review,* 87(4), 557–80.

Seron, C., Silbey, S. S., Cech, E., & Rubineau, B. (2016). Persistence is cultural: Professional socialization and the reproduction of sex segregation. *Work and Occupations,* 43(2), 178–214. DOI: 10.1177/0730888415618728

Slaton, A. E. (2010). *Race, rigor, and selectivity in US engineering: The history of an occupational color line*. Harvard University Press.

Smith, D. G., Turner, C. S., Osei-Kofi, N., & Richards, S. (2004). Interrupting the usual: Successful strategies for hiring diverse faculty. *The Journal of Higher Education,* 75(2), 133–60, DOI: 10.1080/00221546.2004.11778900

Smith, K. N., & Gayles, J. G. (2018). "Girl power": Gendered academic and workplace experiences of college women in engineering. *Social Sciences*, *7*(2), Article 11. DOI: 10.3390/socsci7010011

Spence, M. (1973). Job market signaling. *Quarterly Journal of Economics,* 87, 355–79.

Stewart, D.-L., & Nicolazzo, Z. (2018). High impact of [whiteness] on trans* students in postsecondary education. *Equity & Excellence in Education,* 51(2), 132–45. DOI: 10.1080/10665684.2018.1496046

Stiglitz, J. E. (2000). The contributions of the economics of information to twentieth century economics. *Quarterly Journal of Economics,* 115, 1441–78.

Strayhorn, T. L., & Johnson, R. M. (2016). *What underrepresented minority engineering majors learn from co-ops & internships* [Paper presentation]. American Society for Engineering Education Conference, New Orleans, LA, United States.

Tate, K. A., Caperton, W., Kaiser, D., Pruitt, N. T., White, H., & Hall, E. (2015). An exploration of first-generation college students' career development beliefs and experiences. *Journal of Career Development,* 42(4), 294–310. DOI: 10.1177/0894845314565025

U.S. Equal Employment Opportunity Commission. (n.d.). *Prohibited employment policies/practices*. Retrieved from https://www.eeoc.gov/prohibited-employment-policiespractices

Walker, H. J., Feild, H. S., Giles, W. F., Bernerth, J. B., & Short, J. C. (2011). So what do you think of the organization? A contextual priming explanation for recruitment web site characteristics as antecedents of job seekers' organizational image perceptions. *Organizational Behavior and Human Decision Processes,* 114(2), 165–78.

Walker, H. J., Feild, H. S., Bernerth, J. B., & Becton, J. B. (2012). Diversity cues on recruitment websites: Investigating the effects on job seekers' information processing. *Journal of Applied Psychology,* 97(1), 214–24. DOI: 10.1037/a0025847

Wille, L., & Derous, E. (2017). Getting the words right: When wording of job ads affects ethnic minorities application decisions. *Management Communication Quarterly,* 31(4), 533–58. DOI: 10.1177/0893318917699885

Woodcock, A., & Bairaktarova, D. (2015). Gender-biased self-evaluations of first-year engineering students. *Journal of Women and Minorities in Science and Engineering,* 21(3), 255–69. DOI: 10.1615/JWomenMinorScienEng.2015013125

Zakrasek, N. (2017). Connecting more Americans with jobs. Retrieved from https://www.blog.google/products/search/connecting-more-americans-jobs/.