

A Quantitative Study Examining the Relationship Between Gender and Career Advancement in Product Management

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Gender-based career advancement disparities are prevalent across various fields, yet their impact on product management remains understudied. This quantitative correlational study investigated career advancement barriers faced by 173 full-time, salaried U.S.-based product managers and senior product managers, focusing on gender differences. Survey data explored the relationship between gender and perceived barriers, including lack of culture fit, exclusion from informal networks, mentoring deficiencies, poor organizational career management, limited developmental assignments, and geographic mobility constraints. Organizational justice theory and the glass ceiling metaphor framed this research, utilizing a Mann-Whitney U test for analysis. Results revealed a statistically significant relationship between gender and the perception of 'lack of culture fit' as a career advancement barrier. This study contributes to existing gender-based career advancement disparity research, highlighting the intersection of gender, career progression, and the product management field. The findings offer valuable insights for product management professionals and organizational leaders to promote gender equity through informed career development strategies.

Keywords: product manager, product management, gender, career advancement, disparity, perceived barriers, glass ceiling

INTRODUCTION

The glass ceiling phenomenon, coined as a metaphor by Loden in 1987, has a long history of driving gender-based career advancement disparities that can prevent some women from getting promoted or achieving leadership positions in their companies (Grangeiro et al., 2022). Scholars have described the glass ceiling phenomenon as an invisible barrier limiting women's ability to advance into senior-level positions, even if these women are skilled, educated, and have extensive experience in their field (Bloch et al., 2021; Tripathi et al., 2021). Some glass ceiling researchers attribute the career advancement disparity to women, noting that women were less productive than men (Showkat, 2021) or personality traits (Bassir et al., 2022;

Collischon, 2021). Some glass ceiling scholars have posited that patriarchal social constructs influence individuals to associate leadership positions with men (Moorthy et al., 2022; Taparia & Lenka, 2022). Nonetheless, despite 5 decades of research on the glass ceiling phenomenon, metaphorical glass ceilings and gender-based career advancement disparities persist, often evident in management positions (Grangeiro et al., 2022).

Product management is an emerging profession that involves partnering with various internal and external stakeholders to develop, launch, and manage products (Gemino & Reich, 2023). The product management profession evolved from the brand management profession and included a broad range of solutions such as tangible products, software, and services (Shulman et al., 2023). Given the profession's nascency, there is limited scholarly literature on the field (Dash, 2022; Hyrynsalmi et al., 2021). Professionals of other disciplines benefit from knowing how gender-based career advancement disparities impact their professions; product management professionals must be given the same knowledge.

The focus of this study is the perceived barriers to career advancement in the product management profession in a gendered context. Academics have a wealth of available data informing how gender-based career advancement disparities may impact their professional growth (Van Miegroet et al., 2019; Veelen & Derks, 2022). Accounting professionals have contextual knowledge about the glass ceiling phenomenon specific to their industry (Cohen, 2020). Hospitality professionals have data on gender-based career advancement disparities (Tam et al., 2022). While a large body of glass ceiling and career advancement literature is available, the specific populations leveraged in extant literature impede the ability to generalize findings in the product management profession.

The glass ceiling phenomenon can greatly impact an organization's culture because it could alienate certain individuals by making them feel excluded, lower morale, and create a climate of distrust. Eliminating gender disparities in the workplace is deeply connected to positive social change because it promotes a fair society in which all individuals have equal access to opportunities (Cislaghi & Heise, 2020). Showkat (2021) supported this view and asserted that gender equality is essential to an ideal societal structure. This study has the potential to promote positive social change by arming practitioners with reliable data with practical implications to mitigate gender-based career advancement disparities.

BACKGROUND

Extant gender inequity research has been focused on organizational justice, gender bias, and glass ceiling constructs supports disparate career advancement between genders (Bloch et al., 2021; Cohen et al., 2020; Hoang et al., 2022). A study on career advancement in the hospitality industry indicated that only men could advance to mid-level management positions before 30 years of age, and only men could advance to top-level management positions after 50 years of age (Tam et al., 2022). Falco et al. (2023) discovered a statistically significant relationship between gender and academic career advancement. Tabo et al. (2021) found a relationship between gender and career advancement in the healthcare industry. Despite evidence of gender disparities in career advancement in several industries, little is known about the relationship between gender and career advancement in the product management profession.

Product management is an emerging profession in the engineering and technology field in which the job responsibilities and challenges vary amongst teams within an organization and across differing organizations (Kelly, 2019; Springer & Miler, 2022). Historically, product management was considered an extension of brand management, having been popularized in the 1930s by McElroy at Proctor and Gamble, a large consumer packaged goods firm (Hyrynsalmi et al., 2021). Modern product management has since become an integral aspect of an organization, particularly software companies, and is focused on driving profitability and viability for products and, ultimately, the organization (Springer & Miler, 2022; Sverrisdottir et al., 2014).

Product managers are responsible for a broad set of activities. These activities include collaboratively creating, launching, and iterating products to ensure that their product(s) align with customer, market, and/or organizational needs (Sverrisdottir et al., 2014; Tkalic et al., 2022). The specific responsibilities vary depending on the teams' or organizations' needs (Kelly, 2019; Springer & Miler, 2022). Product

manager responsibilities also vary depending on the team hierarchy or title nomenclature. Tenured product managers are considered senior product managers (Kelly, 2019). In contrast, an entry-level product position is often considered an associate product manager, and a mid-career product professional is typically considered a product manager (Kelly, 2019).

Given the nascency of the product management profession, shared knowledge of career advancement trends is not yet widespread (Hyrnsalmi et al., 2021). The volume of scholarly literature focused on product management has grown in the last two decades (Donthu et al., 2022; Hyrnsalmi et al., 2021); however, there is a relatively small group of scholars researching the profession (Hyrnsalmi et al., 2021). Existing product management literature includes broad topic areas, including green product development (Candrianto et al., 2023), supply chain product development (Gress et al., 2021), and blockchain product development (Musamih et al., 2022); however, information related to the product management career path is also important to address.

Despite its long history and awareness, the glass ceiling phenomenon in the workplace persists across many industries. These industries include healthcare and automotive (Brown et al., 2021; Müldür & Karaca, 2022; Üstgörül, 2022). Loden is attributed to popularizing the metaphor 'glass ceiling' to describe gender-based promotion disparities favoring men (Loden, 1987; Tripathi et al., 2021). In a 1987 article, Loden described the female career trajectory and the relative underrepresentation of women in senior management as a plateau. Loden asserted that leadership had not yet valued women's performance and potential despite women entering the workforce en masse in the 1960s.

Gender imbalance has continued to permeate more recent research. Benson et al. (2024) researched how management perceptions of employee potential performance across genders impacted promotions into senior positions and discovered a variance in the perception of employee potential performance between men and women. Benson et al. (2024) discovered that women were more likely to be perceived as having lower potential performance than men despite having higher actual performance ratings, which was a factor in explaining the gender-based promotion gap. Extant research suggests that managers may inappropriately assess the future potential of female employees based on subjective data despite recorded performance ratings.

The gender inequity also spans organizational levels. Bloch et al. (2021) examined the glass ceiling phenomenon through the lens of both gender and race. They discovered an underrepresentation of Black men and Black women in middle- and senior-management positions compared to White men and White women. The authors' findings suggested that the glass ceiling phenomenon may have a racial basis, not just gender (Bloch et al., 2021).

Cohen et al. (2020) analyzed the perceptions of gender-based promotion disparities in the accounting profession. They found that accounting professionals perceive biases against women relative to promotions to senior-level positions, lacking mentorship and advocacy from men within the organization (Cohen et al., 2020). Extant research supports the existence of the glass ceiling phenomenon as an explanation for the underrepresentation of women in senior-level management positions despite no difference in performance (Benson et al., 2024) and no differences when it comes to job readiness for senior-level positions (Tripathi et al., 2021).

Along with promotions, perceptions of fairness elevate the idea of organizational justice. Greenberg (1990) studied employees' perceptions of fairness in decision-making and practices within an organizational context and popularized the concept as the organizational justice theory. Organizational justice theory has been leveraged as the theoretical foundation for research topics, including favoritism in the hospitality industry (Arici et al., 2021; Shapoval, 2019) and performance evaluations in the manufacturing industry (SeTin et al., 2022). It is important to understand how the organizational justice theory can be used to understand the distribution of promotions in the product management profession. Organizational justice theory includes four categories: distributive, informational, procedural, and interactional (Hoang et al., 2022; Russen et al., 2021; Shapoval, 2019). Extant research has leveraged the distributive justice component of organizational justice theory to explore equity in promotions (Harris et al., 2004; Wang et al., 2019) and identified the importance of transparency and equity in promotion processes for well-functioning organizations.

The gap in this current research is based on Kim's (2022) research on gender-based disparities and career advancement into senior-level positions in a software company. This research could fill a meaningful gap by studying the perceived barriers to career advancement, specifically in the product management profession. Kim (2022) suggested future gender-based disparities and career advancement research in the engineering and technologies fields and indicated that using primary data in said future research would be ideal, given the dearth of scholarly literature available on the topic. Product management is an emerging profession within the engineering and technology fields (Hyrnsalmi et al., 2021; Springer & Miler, 2022; Tkalich et al., 2022). Further, Hyrnsalmi et al., 2021 explored extant product management research and highlighted a need for more product management literature. While the general requirements for a product manager role are documented (Nemec & Wroblowska, 2018), and the prevalence of the glass ceiling phenomenon and its impact on gender-based career advancement disparities is also well-known (Benson et al., 2024; Kim, 2022; Socratus, 2020), the question of whether there is a relationship between gender and the perceived barriers to career advancement in the product management profession requires an answer.

This study is needed to build on existing gender-based career advancement research for advancing the product management profession. The existing scholarly product management literature discusses optimal product management processes (Wilson & Goffnett, 2022) and the importance of product management as a discipline (Robbins & O'Connor, 2023), yet little research exists on the intersectionality of product management, the perceived barriers to career advancement, and gender (Hyrnsalmi et al., 2021). This study could serve as foundational literature and enable future researchers to expand on the limited knowledge focused on product management and career advancement. This study could also address a meaningful gap in the current research scholarly literature by providing organizational leaders with insights to effectively address perceived barriers to career advancement, understand gender-based disparities, and enable women to advance to leadership positions.

PROBLEM

The general research problem is that patriarchal systems often inhibit equitable career advancement opportunities for women in the workplace, leading to increased organizational turnover (Alobaid et al., 2020; Dwivedi et al., 2023; Moorthy et al., 2022). The specific research problem that will be addressed through this study is that it is not known whether there is a relationship between gender and the perceived barriers to career advancement in the product management profession. Ramezani et al. (2021) conducted a quantitative study on gender-based career advancement disparities and found that the glass ceiling phenomenon significantly influenced the limited promotion of women to managerial positions. They discovered that the glass ceiling phenomenon could predict 48% of the variance of career advancement for women in a university setting (Ramezani et al., 2021). Nathan and Chandrasekhar (2023) found gender-based career advancement disparities in the otolaryngology field, as only 5.1% of chair positions in the otolaryngology field are held by women. Mahat and Aithal (2022) conducted a quantitative study on women and career advancement. They found that, despite organizational policies and optimism, women perceived the necessity to perform better than men to advance their careers (Mahat & Aithal, 2022). Paradoxically, Kim (2022) researched gender-based career advancement disparities and found that women are less likely to be promoted when performance is controlled for. Kim (2022) recommended future research on gender-based career advancement, specifically in the engineering and technology field, as this knowledge base is lacking.

Extant research has established the influence of gender diversity on positive organizational outcomes (Delivering Through Diversity, 2018; Gomez & Bernet, 2019; Wu et al., 2021). Wu et al. (2021) conducted a quantitative study supporting a positive correlation between women in senior management and innovation compared to men. This research complements existing literature that supports that gender diversity can positively impact innovation and financial performance within organizations (Delivering Through Diversity, 2018; Gomez & Bernet, 2019). Other benefits of gender diversity include inclusive hiring practices and a culture of clear transparency, which is needed in organizations to ensure open communication opportunities are available to everyone.

PURPOSE

The purpose of this quantitative, correlational study was to compare the relationship between gender and the perceived barriers to career advancement in the product management profession. The independent variable, gender, was defined as a dichotomous variable (i.e., female and male). The dependent variables cumulatively represented the perceived barriers to career advancement and are defined as six factors in the Perceived Barriers to Career Advancement survey (Lyness & Thompson, 2000). These six factors and dependent variables were the perception of lack of culture fit, the perception of exclusion from informal networks, the perception of lack of mentoring, the perception of poor organizational career management processes, the perception of difficulty getting developmental assignments, and the perception of difficulty obtaining opportunities for geographic mobility. Although extant literature explored gender biases concerning organizational justice theory and the glass ceiling phenomenon, it is important to understand this problem in the product management profession, too.

Six research questions are designed to address the research problem and align with the study's purpose.

Research Question 1: *What is the relationship between gender and the perception of lack of culture fit in the product management profession for product managers and senior product managers based in the United States?*

H₀₁: *There is no significant relationship between gender and the perception of lack of culture fit in the product management profession for product managers and senior product managers based in the United States.*

H_{a1}: *There is a significant relationship between gender and perception of the lack of culture fit in the product management profession for product managers and senior product managers based in the United States.*

Research Question 2: *What is the relationship between gender and the perception of exclusion from informal networks in the product management profession for product managers and senior product managers based in the United States?*

H₀₂: *There is no significant relationship between gender and the perception of exclusion from informal networks in the product management profession for product managers and senior product managers based in the United States.*

H_{a2}: *There is a significant relationship between gender and the perception of exclusion from informal networks in the product management profession for product managers and senior product managers based in the United States.*

Research Question 3: *What is the relationship between gender and the perception of lack of mentoring in the product management profession for product managers and senior product managers based in the United States?*

H₀₃: *There is no significant relationship between gender and the perception of lack of mentoring in the product management profession for product managers and senior product managers based in the United States.*

H_{a3}: *There is a significant relationship between gender and the perception of lack of mentoring in the product management profession for product managers and senior product managers based in the United States.*

Research Question 4: *What is the relationship between gender and the perception of poor organizational career management processes in the product management profession for product managers and senior product managers based in the United States?*

H₀₄: *There is no significant relationship between gender and the perception of poor organizational career management processes in the product management profession for product managers and senior product managers based in the United States.*

H_{a4}: *There is a significant relationship between gender and the perception of poor organizational career management processes in the product management profession for product managers and senior product managers based in the United States.*

Research Question 5: *What is the relationship between gender and the perception of difficulty getting developmental assignments in the product management profession for product managers and senior product managers based in the United States?*

H₀₅: *There is no significant relationship between gender and the perception of difficulty getting developmental assignments in the product management profession for product managers and senior product managers based in the United States.*

H_{a5}: *There is a significant relationship between gender and the perception of difficulty getting developmental assignments in the product management profession for product managers and senior product managers based in the United States.*

Research Question 6: *What is the relationship between gender and the perception of difficulty obtaining opportunities for geographic mobility in the product management profession for product managers and senior product managers based in the United States?*

H₀₆: *There is no significant relationship between gender and the perception of difficulty obtaining opportunities for geographic mobility in the product management profession for product managers and senior product managers based in the United States.*

H_{a6}: *There is a significant relationship between gender and the perception of difficulty obtaining opportunities for geographic mobility in the product management profession for product managers and senior product managers based in the United States.*

Theoretical Foundation

In this study, a theoretical model was used that included two components. Varpio et al. (2020) defined a theoretical framework as one or more theories or concepts that ground a research study in logical thought and serve as the framework for understanding the research approach. The theories that ground this study include the glass ceiling phenomenon popularized by Loden (Tripathi et al. 2021), and Greenberg's (1990) organizational justice theory. The logical connections between the theoretical framework and the nature of this study include the glass ceiling phenomenon, which refers to gender bias that traditionally impedes women from career advancement (Bloch et al., 2021; Cotter et al., 2001; Hospido et al., 2022). The glass ceiling phenomenon is related to the research problem because it is well-established that women are less likely to be promoted than men. Powell and Butterfield (2015) systematically reviewed glass ceiling literature and found evidence of gender-based career advancement disparities over a 30-year-period. Naguib and Madeeha (2023) found evidence of gender-based career advancement disparities based on a preference for male managers. Taparia and Lenka's (2022) research supported the existence of glass ceilings favoring men and suggested that organizational policies and laws can perpetuate the glass ceiling effect.

Despite decades of research and general awareness, contemporary research suggests that the glass ceiling phenomenon persists (see Bloch et al., 2021; Brown et al., 2021; Powell & Butterfield, 2015). The glass ceiling phenomenon is also related to the study's purpose because the glass ceiling phenomenon and the study's purpose are aligned in examining the relationship between gender and the perceived barriers to career advancement. The glass ceiling phenomenon is related to the nature of the study because the quantitative methodology can be used to measure gender and the perceived barriers to career advancement to create new knowledge within the product management profession. It is also related to the correlational research design because understanding the relationship between gender and the perceived barriers to career advancement is accomplished through a non-experimental correlational research design.

Organizational justice theory describes how employees perceive fairness within a workplace (Greenberg, 1990; Hoang et al., 2022; Russen et al., 2021). Organizational justice theory includes four subdimensions, distributive justice, procedural justice, interactional justice, and informational justice, which helps researchers and practitioners dissect perceived fairness at a granular level instead of at a general, macro level (Greenberg, 1990). Organizational justice theory has been widely used to understand the relationship between gender and career advancement (Cohen et al., 2020; Hoang et al., 2022; Russen et al., 2021).

Organizational justice theory is related to the research problem because the study will explore whether the perceived barriers to career advancement can be predicted by gender. This theory is also related to the study's purpose because the results could promote high organizational justice within the product management profession by developing new knowledge of the relationship between gender and the perceived barriers to career advancement. Finally, organizational justice theory is related to the nature of the study because the quantitative methodology is used to observe phenomena and objectively understand data; this study leveraged quantifiable data to understand the relationship between gender and the perceived barriers to career advancement in the product management profession. It is also related to the correlational research design because the approach the study examined the strength of the relationship between gender and the perceived barriers to career advancement in the product management profession, aligned with high organizational justice.

SIGNIFICANCE OF THE STUDY

This study is significant because it fills a gap in the glass ceiling knowledge base in the product management profession. The research findings could promote positive social change by enabling organizational leaders, including product team leads, human resources leaders, and employee resource group leaders, to make intentional career advancement policies and decisions that do not exasperate gender-based disparities. This research has the potential to positively impact social change by providing insight into gender-based career advancement disparities in an emerging field, which may have implications for long-term equities for future generations of senior product managers. This research can potentially advance the organizational justice theory and the glass ceiling concept by overlaying context to the product management profession.

Significance to Gender-Based Career Advancement Research

Despite decades of examination, abundant scholarly research provides evidence for statistically significant differences in gender-based career advancement disparities (Brown et al., 2021; Zakaras et al., 2021). This study is significant to the body of gender-based career advancement because it allows for continued curiosity about the topic. Despite the lack of a concrete solution to the gender-based career advancement disparity problem, further research is required to converge upon solutions. Most studies have focused on career advancement disparities in professions not related to product management. This study is significant to the body of career advancement research because it expands the breadth of knowledge into new professional domains, which serves to evolve the science.

Significance to the Product Management Profession

While career advancement research is available in healthcare (Tabo et al., 2020), academia (Nikunen & Lempiäinen, 2020; Prozesky & Beaudry, 2019), and other professions, little is known about career advancement in the product management profession. Insights from this study may provide product management researchers with data from which to extend further product management literature. Product management scholarly literature to date typically focused on operational practices (Kittlaus & Clough, 2009; Wilson & Goffnett, 2022) and systematic literature reviews (Gemino & Reich, 2023; Hyrynsalmi et al., 2021). This study may provide researchers with a new lens through which to evaluate the product management profession. Product management scholarly literature is scant when compared to academic literature available in other disciplines (Hyrynsalmi et al., 2021). This research has the potential to add to a limited body of research, giving other researchers a foundation from which to build.

The study can potentially advance the product management practice and provide practitioners with data-driven decision-making tools. This study may help to enable equitable career advancement opportunities regardless of gender. Organizational leaders may be able to create career advancement opportunities and solutions that intentionally consider the perceptions of their diverse teams so that blind ignorance may not be leveraged as an explanation for gender-based career advancement disparities. Extant research suggests that mentorship (Mcilongo & Strydom, 2021), training, job rotations, and career counseling (Bagdadli & Gianecchini, 2019) can be career advancement tools; however, it is not yet known how this may be relevant for product managers and senior product managers. The findings in this study may enable organizational leaders to understand which tools may be most impactful in a product management context.

Significance to Social Change

The study has the potential to foster positive social change because it can help organizational leaders create equitable hiring and promotion practices that are well-aligned with ideal social constructs. Equal access to opportunities is embedded in the societal ideals within the United States. It is explicitly stated in the 14th Amendment to the United States Constitution, which indicates that all persons are entitled to equal protection of the laws. Further, the Civil Rights Act of 1964 is intended to guarantee employee social equality by mandating equal access to employment opportunities and prohibiting discrimination based on race, color, religion, sex, and natural origin. The findings of this study have the potential to arm organizational leaders with the guidance that will mitigate gender-based career advancement disparities, drawing closer to social ideals. The study has the potential to realize a lesser gap between federal regulations and constitutional laws that explicitly prohibit inequity and perceptions of inequity.

Positive social change effort can be beneficial to organizations as well. Del-Castillo-Feito et al. (2022) posited that socially responsible human resource management practices are socially desired and positively contribute to perceived organizational legitimacy. Of the five identified elements of socially responsible human resource management practices, diversity, job opportunities, and no discrimination were the most statistically significant factors contributing to perceived organizational legitimacy (Del-Castillo-Feito et al., 2022). This study has the potential to positively impact organizational behavior by providing organizational leaders with guidance to eliminate discriminatory practices and/or gender-based career advancement disparities.

METHODS

To address the research questions in this quantitative study, the specific research design was a non-experimental correlational research design. A correlative research design is used in quantitative research when the researcher aims to understand relationships between variables without manipulating variables (Walker, 2005). Further, experimental research design is used when the research purpose intends to elucidate causal relationships between variables (Burkholder et al., 2020). An example of a causal relationship may include the relationship between smoking cigarettes and lung cancer, whereby data suggests that smoking cigarettes causes lung cancer. Given that the research purpose is not to elucidate

causality, an experimental research design was not selected. I leveraged a correlational design to measure the relationship between gender and the perceived barriers to career advancement in the product management profession for product managers and senior product managers, as the researcher cannot alter each of the variables.

To adequately address the research problem, full-time, salaried product managers and senior product managers based in the United States responded to survey questions detailing their perceptions related to culture fit, informal networks, lack of mentoring, organizational career management processes, the degree of difficulty obtaining developmental assignments, and the degree of difficulty for obtaining opportunities for geographic mobility. The research instrument, Perceived Barriers to Career Advancement Scales, was created by Lyness and Thompson (2000), who gave permission to use it for non-commercial research and educational purposes without written agreement. This quantitative analysis helped determine the scenarios in which gender was a predictor variable for the outcome: the perceived barriers to career advancement in the product management profession for product managers and senior product managers.

The variables included in this study were as follows: independent variable, IV = gender (male, female); dependent variables, DV1 = the perception of lack of culture fit in the product management profession; DV2 = the perception of exclusion from informal networks in the product management profession; DV3 = the perception of lack of mentoring in the product management profession; DV4 = the perception of poor organizational career management processes in the product management profession; DV5 = the perception of difficulty getting developmental assignments in the product management profession; DV6 = the perception of difficulty obtaining opportunities for geographic mobility in the product management profession.

The measurement scales relevant to this study are as follows: Independent Variable = Categorical; Dependent Variables = Continuous. The research analysis approach in this study was originally intended to be an independent samples t-test, as extant scholarly literature supports independent samples t-tests as appropriate for use when there is one dichotomous independent variable and one continuous dependent variable and the intent to compare the means of two groups (Burkholder et al., 2019; Ross & Wilson, 2017). Ultimately, a Mann-Whitney U test was leveraged as a non-parametric alternative.

Procedures for Recruitment, Participation, and Data Collection

Given the original research population, the first step was to recruit product managers and senior product managers employed at Forbes Cloud 100 product-based software companies via LinkedIn and other online product management communities (e.g., Women in Product Facebook group, Black Product Managers Slack channel) to participate in an online questionnaire. This communication was shared on a public-facing posts on a LinkedIn profile, utilizing pertinent hashtags (i.e., #productmanagement, #productmanager #seniorproductmanager #research #feedback), which is intended maximize reach to the targeted population. The posts indicated that participants must be currently employed as product managers and senior product managers at Forbes Cloud 100 companies, and that the intent was to understand their perspective regarding career advancement in the product management profession. Similar messages, excluding the hashtag strategy, were posted in multiple Slack communities to drive interested participants to send an email for participation in the study. The language used in the recruitment messages avoided scholarly jargon and specified that a questionnaire would be used and not an interview. In addition, it was intentionally concise with the intent to maximize responses from eligible potential participants. To pique the attention of the targeted audience and encourage as many responses as possible from qualified potential participants, the posts also included an image and a clear headline. Given the low response rate likely attributed to the narrow sample population, a shift in data collection was taken to study full-time, salaried product managers and senior product managers based in the United States, instead of product managers and senior product managers employed at 2023 Forbes Cloud 100 companies.

The data collection process included the informed consent form and the demographic questionnaire which will include gender and job title (i.e., product manager, senior product manager), and a binary indication of whether they were based in the United States. The self-administered questionnaire included the Perceived Barriers to Career Advancement Scales (Lyness & Thompson, 2000). The participants were

able to save and restart the questionnaire if the participant was not able to finish submitting their responses in one sitting.

The Institutional Review Board (IRB) is responsible for validating that all research is conducted that complies with the university's ethical process and aligns with United States federal regulatory standards. An Institutional Review Board is commonplace in the scholarly research community and are designed to ensure that ethical standards are met, including informed consent and the voluntary participation in research (Josephson & Smale, 2020). After reviewing the informed consent material, participants could exit the survey without providing any additional personal information by selecting the survey question option indicating that they did not consent and/or by closing their browser window.

An existing research instrument to measure the dependent variables as it correlates to gender. Lyness and Thompson (2000) authored the Perceived Barriers to Career Advancement Scales research instrument which measures the degree to which various factors represent barriers to career advancement. The instrument type was a rating scale, and the authors of these scales provided permission to use in a research setting without a fee.

The Perceived Barriers to Career Advancement Scales (Lyness & Thompson, 2000) provided the ability to measure the extent to which each of the 26 factors has been problematic to career advancement on scale ranging from 1 (no problem at all) to 5 (a very serious problem). The Perceived Barriers to Career Advancement Scales included six scales:

- (a) lack of culture fit,
- (b) excluded from informal networks,
- (c) lack of mentoring,
- (d) poor organizational career management processes
- (e) difficulty getting developmental assignments,
- (f) difficulty obtaining opportunities for geographic mobility.

The Perceived Barriers to Career Advancement Scales was appropriate for this study because the scales measured the perception of employees' barriers to career advancement and the population was limited to product managers and senior product managers. Lyness and Thompson (2000) indicated coefficient alphas for the scales ranging from .69 for difficulty getting geographic mobility opportunities to .84 for difficulty getting developmental assignments. No validity or factor analyses were indicated. The Perceived Barriers to Career Advancement Scales (Lyness & Thompson, 2000) research instrument was previously used for a quantitative correlational study in the automotive industry (Brown et al., 2021); there were adequate levels of internal reliability were found in this study. In this study, gender was defined in a binary manner (i.e., female, male) and was not manipulated in any way. The Perceived Barriers to Career Advancement Scales (Lyness & Thompson, 2000) allows participants to indicate their perception relative to the degree each factor has been problematic to them in their current career using a 5-point Likert scale ranging from 1 – *no problem at all* to 5 = *a very serious problem*.

Lack of Culture Fit Scale

1. Feeling pressure to fit in or adapt to the culture
2. Few role-models
3. Feeling like you are an outsider
4. Not feeling comfortable asserting your views because of possible consequences
5. Feeling that you can't make mistakes and learn from them without threatening your job or your future
6. Feeling like you are held to a higher standard than others
7. People tend to recommend and select people like themselves

Excluded From Informal Networks Scale

8. Being excluded from social events and informal interactions with colleagues, either on or off the job
9. Limited access to informal networks

Lack of Mentoring Scale

10. Not enough mentoring (e.g., counseling about career opportunities)
11. Not having a senior manager who facilitates your career progress
12. Not getting access to the right people (or not knowing the right people)
13. Not receiving enough meaningful feedback about your strengths and weaknesses

Poor Organizational Career Management Processes Scale

14. Poor career development and planning processes
15. Not knowing what the criteria are for advancement
16. Being unsure about how to initiate a job change

Difficulty Getting Developmental Assignments Scale

17. Not getting the right jobs early in your career (that you need for later advancement)
18. Lack of opportunities to move across functions or businesses
19. Difficulty getting access to critical developmental assignments (e.g., serving on highly visible task forces or committees)
20. Not being considered when promotions for bigger jobs arise
21. Difficulty getting access to opportunities
22. Difficulty getting access to job assignments with bottom line responsibility
23. Not being offered stretch assignments

Difficulty Obtaining Opportunities for Geographic Mobility Scale

24. Needing to gain international experience in order to advance
25. Not being considered for jobs that require relocation (domestic)
26. Difficulty getting international assignments

Data Analysis Plan

Data collection occurred for 11 days, at which point, the demographic information provided was reviewed to ensure that participation is appropriate for the study. In addition, it was checked whether there are enough responses in each of the four strata (i.e., females, males, product managers, and senior product managers) for subsequent simple randomized sampling. Questionnaires with missing responses were excluded from the dataset.

SPSS was utilized to perform a Mann-Whitney U test for comparing the sample means between the two unrelated groups, namely females and males. While a cross-section of the strata was intended to validate that the study included adequate responses from product managers and senior product managers, the Mann-Whitney U test did not include job titles as separate groups. There were two groups (i.e., females, males) each with six scores (i.e., (a) lack of culture fit, (b) excluded from informal networks, (c) lack of mentoring, (d) poor organizational career management processes (e) difficulty getting developmental assignments, (f) difficulty obtaining opportunities for geographic mobility).

Data Collection

The study's data collection was launched on March 28, 2024, after the Institutional Review Board approval, with the original intent of studying product managers and senior product managers at 2023 Forbes Cloud 100 companies. After 75 days of a live Qualtrics questionnaire, only 36 responses were received, of which only 11 were valid. The original questionnaire closed on June 12, 2024. After receiving approval from the Institutional Review Board, the expanded population included full-time, salaried product managers and senior product managers who reside in the United States. Based on the statistical parameters of (a) statistical power = 0.90, (b) effect size = 0.50, (c) alpha level = 0.05 (two-tailed test), which indicates a 90% confidence interval and measures the level of error permitted in the data. The ideal sample size was $N = 172$.

The questionnaire was live for 11 days, opening June 12, 2024, and closing June 23, 2024, with 212 product managers and senior product managers attempting the questionnaire. Only 173 participants answered all of the questions, exceeding the number required to adequately test each hypothesis. Of the 173-sample size, 104 identified as female and 69 identified as male; 74 identified as product managers, and 99 identified as senior product managers. Participation in the survey was anonymous as it did not request participants to indicate their email, employer, or state of residence. IP addresses were not recorded or saved as a part of data collection.

The postings on social media were leveraged to recruit potential participants on platforms including LinkedIn, the Women in Product Facebook Group, and the Black Product Managers Slack channels. The social media posts were reposted by others, exponentially increasing awareness of the study. The LinkedIn’s direct messaging feature was also used to identify product managers and senior product managers based in the United States and shared the recruitment message directly. The recruitment messages included a link to the questionnaire in Qualtrics.

RESULTS

Table 1 displays the frequency counts for the selected variables. There was a total of 104 female participants and 69 male participants. A total of 74 product managers and 99 senior product managers participated in the study.

TABLE 1
FREQUENCY COUNTS FOR SELECTED VARIABLES (N = 173)

Job title	Females	Males	Sum
Product manager	46	28	74
Senior product manager	58	41	99
Sum	104	69	173

Independent Samples *T*-Test Assumptions

The independent samples *t* test compares the overall means of two distinct groups to determine if there is a significant difference between the means of the two groups (Meyers et al., 2013). Meyers et al. (2013) suggested that there are three assumptions related to the independent samples *t* test: the data is quantitative and approximately normally distributed, homogeneity of variances, and independent observation between and within groups. The dependent variables in this study were measured on a continuous scale (i.e., Likert scale). The independent variable consisted of two categories (i.e.: female and male). The independence of observations is another core assumption for independent samples *t* tests, and it was valid for this study’s data set. It was not reasonable for a single participant to be a product manager and a senior product manager, or a male and female. Table 2 displays the results of the Shapiro-Wilk test of normality using SPSS Statistics. The results of the Shapiro-Wilk test indicated that the data deviated from a normal distribution, and as such, an independent samples *t* test could not be leveraged to test this study’s assumptions.

TABLE 2
SHAPIRO-WILK TEST RESULTS FOR NORMALITY

Variable	Gender	<i>df</i>	Sig.
Lack of culture fit	Female	104	.107
	Male	69	.757
Exclusion from informal networks	Female	104	<.001
	Male	69	<.001
Lack of mentoring	Female	104	.002
	Male	69	.005
Poor organizational career management processes	Female	104	.003
	Male	69	.007
Difficulty getting developmental assignments	Female	104	.171
	Male	69	.092
Difficulty obtaining opportunities for geographic mobility	Female	104	<.001
	Male	69	<.001

Mann-Whitney *U*-Test Assumptions

Home (2016) indicated that the Mann-Whitney *U* test is considered a non-parametric equivalent test to the independent samples *t* test, used when non-normal distribution is assumed to be true. The Mann-Whitney *U* test is used to test whether the distribution of scores (i.e., mean ranking) of one group differs from the distribution of score differs from another group. Home (2016) confirmed that two primary assumptions must be satisfied to leverage the Mann-Whitney *U* test, whereby independent observation between and within groups and that while the distribution can be non-normal, they must be similar in shape. If the distribution shapes are statistically significantly different, the test may not accurately compare the mean ranks of the two groups. The independence of observations is another core assumption for independent samples *t*-tests, and it was valid for this study's data set. It was unreasonable for a single participant to be a product manager and a senior product manager, or a female and male. We leveraged Levene's test to statistically check for similar distribution. Table 3 displays Levene's Test for non-parametric homogeneity of variance, which shows significance levels above 0.05 for each variable. Given that the *p*-value is greater than $p = 0.05$, we rejected the null hypothesis, suggesting that the variances are equal.

TABLE 3
LEVENE'S TEST FOR NON-PARAMETRIC HOMOGENEITY OF VARIANCE

Variable	Measure of dispersion	Levene statistic	Sig.
Lack of culture fit	Based on Mean	1.876	.173
	Based on Median	1.961	.163
Exclusion from informal networks	Based on Mean	.009	.926
	Based on Median	.024	.877
Lack of mentoring	Based on Mean	.396	.530
	Based on Median	.130	.719
Poor organizational career management processes	Based on Mean	.106	.746
	Based on Median	.156	.693
Difficulty getting developmental assignments	Based on Mean	.493	.483
	Based on Median	.489	.485
Difficulty obtaining opportunities for geographic mobility	Based on Mean	.000	.999
	Based on Median	.011	.918

Research Question 1

To address the first research question, the goal was to understand the relationship between gender and the perceived barrier to career advancement related to lack of culture fit. RQ 1 was: What is the relationship between gender and the perception of lack of culture fit in the product management profession for product managers and senior product managers based in the United States? The related null hypothesis was H_{01} : There is no significant relationship between gender and the perception of lack of culture fit in the product management profession for product managers and senior product managers based in the United States. Table 4 displays the Mann-Whitney U test statistics comparing the mean rank differences between gender and the perception of lack of culture fit. The relationship was statistically significant ($p = .006$), providing support to reject the null hypothesis for RQ 1. The effect size was relatively small at a value of .21.

TABLE 4
MANN-WHITNEY U-TEST STATISTICS

Variable	Gender	<i>N</i>	Mean rank	Sig.	Effect size <i>r</i>
Lack of culture fit	Female	104	95.53	.006	.21
	Male	69	74.14		
Exclusion from informal networks	Female	104	90.70	.229	.09
	Male	69	81.43		
Lack of mentoring	Female	104	90.45	.264	.08
	Male	69	81.80		
Poor organizational career management processes	Female	104	85.12	.541	.05
	Male	69	89.84		
Difficulty getting developmental assignments	Female	104	90.24	.295	.08
	Male	69	82.12		
Difficulty obtaining opportunities for geographic mobility	Female	104	87.28	.926	.01
	Male	69	86.58		

Research Question 2

To address the second research question, the goal was to understand the relationship between gender and the perceived barrier to career advancement related to exclusion from informal networks. RQ 2 was: What is the relationship between gender and the perception of exclusion from informal networks in the product management profession for product managers and senior product managers based in the United States? The null hypothesis was H_{02} : There is no significant relationship between gender and the perception of exclusion from informal networks in the product management profession for product managers and senior product managers based in the United States. Table 4 displays the Mann-Whitney U test statistics comparing the mean rank differences between gender and the perception of exclusion from informal networks. The relationship was not significant ($p = .229$), providing no support to reject the null hypothesis for RQ 2. The effect size was small at a value of .09.

Research Question 3

The focus of addressing the third research question was to understand the relationship between gender and the perceived barrier to career advancement related to lack of mentoring. RQ 3 was: What is the relationship between gender and the perception of lack of mentoring in the product management profession for product managers and senior product managers based in the United States? The null hypothesis was H_{03} : There is no significant relationship between gender and the perception of lack of mentoring in the product management profession for product managers and senior product managers based in the United States. Table 4 displays the Mann-Whitney U test statistics comparing the mean rank differences between gender and the perception of lack of mentoring. The relationship was not significant ($p = .264$), providing no support to reject the null hypothesis for RQ 3. The effect size was small at a value of .08.

Research Question 4

To address the Research Question 4, the goal was to understand the relationship between gender and the perceived barrier to career advancement related to poor organizational career management processes. RQ 4 was: What is the relationship between gender and the perception of poor organizational career management processes in the product management profession for product managers and senior product managers based in the United States? The null hypothesis was H_04 : There is no significant relationship between gender and the perception of poor organizational career management processes in the product management profession for product managers and senior product managers based in the US. Table 4 displays the Mann-Whitney U test statistics comparing the mean rank differences between gender and the perception of poor organizational career management processes. The relationship was not significant ($p = .541$), providing no support to reject the null hypothesis for RQ 4. The effect size was small at a value of .05.

Research Question 5

To address the fifth research question, the goal was to understand the relationship between gender and the perceived barrier to career advancement related to difficulty getting developmental assignments. RQ 5 was: What is the relationship between gender and the perception of difficulty getting developmental assignments in the product management profession for product managers and senior product managers based in the United States? The null hypothesis was H_05 : There is no significant relationship between gender and the perception of difficulty getting developmental assignments in the product management profession for product managers and senior product managers based in the United States. Table 4 displays the Mann-Whitney U test statistics comparing the mean rank differences between gender and the perception of difficulty getting developmental assignments. The relationship was not significant ($p = .295$), providing no support to reject the null hypothesis for RQ 5. The effect size was small at a value of .08.

Research Question 6

As for the final research question, the goal was to understand the relationship between gender and the perceived barrier to career advancement related to difficulty obtaining opportunities for geographic mobility. RQ 6 was: What is the relationship between gender and the perception of difficulty obtaining opportunities for geographic mobility in the product management profession for product managers and senior product managers based in the United States? The null hypothesis was H_06 : There is no significant relationship between gender and the perception of difficulty obtaining opportunities for geographic mobility in the product management profession for product managers and senior product managers based in the United States. Table 4 displays the Mann-Whitney U test statistics comparing the mean rank differences between gender and the perception of difficulty obtaining opportunities for geographic mobility. The relationship was not significant ($p = .926$), providing no support to reject the null hypothesis for RQ 6. The effect size was small at a value of .01.

Summary

This study used primary data from 74 full-time, salaried product managers and 99 full-time, salaried senior product managers based in the United States to compare the relationship between gender and the perceived barrier to career advancement in the product management profession. The only research hypothesis supported was Research Question 1, which provided evidence that gender is a predictor variable for lack of culture fit as a perceived barrier to career advancement in the product management profession. There was no statistically significant evidence for gender as a predictor variable for the perceived barriers to career advancement in the product management profession for any of the other five dependent variables (i.e., exclusion from informal networks, lack of mentoring, poor organizational career management processes, difficulty getting developmental assignments, difficulty obtaining opportunities for geographic mobility).

DISCUSSION

This study supported the hypothesis that gender influences perceptions of culture fit for product managers such that female product managers are less likely to perceive a culture fit within their organization than their male counterparts. This finding is consistent with previous research that found similar effects in the software industry (Kim, 2022), the hospitality industry (Tam et al., 2022), academia (Falco et al., 2023), and the healthcare industry (Tabo et al. (2021).

Limitations of the Study

While initial limitations were detailed in the opening chapter, the research process revealed additional limitations as the study progressed. One of the limitations of the study is it included product managers and senior product managers, agnostic of industry. While the sample population was based in the United States, the findings do not provide specific guidance for specific industries. Consequently, it remains unclear whether the results are generalizable to the entire product management population or if certain industries would exhibit varying outcomes given similarly structured research questions. Additionally, this study did not include company size as a confounding variable; thus, it cannot be ascertained how the results may vary across organizations of different sizes. The impact of organizational scale or depth of the product management department warrants further inquiry to provide more nuanced and focused insights.

It is also worth noting that the study's exploration of gender was limited to a binary approach, excluding a full spectrum of gender identities. This limitation reduced the diversity of the participant pool. Future research should adopt a more inclusive approach that recognizes gender-fluid and non-binary identities to better understand the perceived barriers to career advancement.

Given the dearth of scholarly research in the product management profession, an estimate of the number of product managers, regardless of level, is not well understood. Although professional platforms (e.g., LinkedIn) have indicated thousands of individuals who identify as product management professionals, there is a scarcity of validated scholarly research to support these estimates. This highlights a need for more comprehensive data to establish a reliable demographic profile of the product management profession.

The research instrument does not consider modern opportunities, including remote work, geographic flexibility, or geographic mobility. When the research instrument was published in 2000, remote work was not as popular as it was at the time this study was published. As such, the study does not examine the impacts of remote work on perceived barriers to career advancement in product management.

Implications

The results of this study could promote positive social change by enabling organizational leaders, including managers of product management teams, talent strategists, and human resources directors, to intentionally support their gender-diverse teams to career advancement with equity. The results of this study may also arm product managers and senior product managers with the validation of their lived experiences. Product managers and senior product managers may use this research to identify areas to address or discuss with appropriate organizational stakeholders to positively influence their career advancement, where feasible. Employees may develop communities in the form of employee resource groups to provide support and tangible resources that foster equitable career advancement. Where employee resource groups exist, this research may shape the direction of their foci.

Extant scholarly literature explored discrimination-blindness as a phenomenon that may explain gender-based career advancement disparities (Fiarman, 2016; Sapon-Shevin, 2017). This study has the potential to continue to raise awareness of potential disparities and perceptions of disparities that may exist within the product management field. This study's findings may enable organizational leaders to curiously explore the perceived barriers to career advancement within their respective teams with specific areas to investigate (e.g., culture fit, informal networks, mentorship, career management processes, developmental assignments, and geographic mobility).

The glass ceiling phenomenon was popularized in 1987 and has been researched in various contexts, including the connection between glass ceilings and female personality traits (Bassir et al., 2022) and the

antecedents of the construct (Alobaid et al., 2020). This addition to the body of literature allows the research to continue. Future research may uncover new forms of barriers that have emerged since the concept was popularized. Loden (1987) asserted that the proverbial glass ceiling represented an invisible barrier that limited women from achieving career advancement. Since then, glass ceiling research has evolved to include race as a potential barrier (Webb, 2022). This study enables future researchers to explore the intersectionality of other social identities, such as race, age, socioeconomic status, and perceived barriers to career advancement in product management.

Future research may examine the relationship between age and perceived barriers to career advancement. Tam et al. (2022) found that males younger than 30 and older than 50 in the hospitality industry had advantages that females didn't have. One avenue for future research would be determining if the same pattern exists within product management. Also, it is possible that age might mediate the relationship between six items measured in the Perceived Barriers to Career Advancement Scales.

Geert Hofstede's research demonstrated that there are societal differences with relation to the acceptance of masculine and feminine behavior (Hofstede, 2011). This research was conducted primarily with product managers from American companies. Future research could be conducted in the cross-cultural context to see if the effects vary across cultures.

This study adds to the body of knowledge about career development and the product management field. Scholarly practitioners can leverage this study to investigate a bevy of inquiries related to product management careers, including the role of organizational cultures and policies perpetuating or dismantling glass ceiling constructs, the psychological effects of gender-based career advancement disparities to mental health, and the impact of technological progression and the advancement of remote work in relation to the glass ceiling construct.

Given the significance of gender as a predictor variable to perceived lack of culture fit as a barrier to career advancement, this study may provide an adequate scholarly lattice to study strategies for and implications of embracing culture fit within a product management team. Extant research has explored the impacts of less than inclusive culture in technology professions, including the *tech bro culture* that fosters an aggressive, fraternal environment (Crandall et al., 2021) or the practice of prioritizing hiring individuals with Ivy League education (Kim, 2023). These practices can perpetuate gender-based career advancement disparities in the workplace. Future research could explore how solving culture fit barriers impacts team performance, employee satisfaction, and employee retention in the product management profession.

CONCLUSIONS

This quantitative, correlational study compared the relationship between gender and the perceived barriers to career advancement in the product management profession. While the study explored six factors previously validated to influence perceived barriers to career advancement, the results only found a statistically significant effect in one of those six factors, which was the lack of culture fit. This result underscores the exigent role that organizational culture and the perception of said culture play in influencing career advancement, especially through a gendered lens. The significance of culture fit to career advancement may suggest that the product management profession grapples with culture awareness and culture inclusivity that disproportionately affect females more than males. This insight provides a starting point for organizational leaders to address cultural constructs that may influence gender-based career advancement disparities.

The absence of statistically significant effects in the other five variables may also offer valuable insights. It may suggest that career advancement barriers may evolve toward a more equitable reality. Further research is necessary to continue to track the dynamic nature of gender-based career advancement disparities, which may provide valuable insights for other professions. It is important to continue to research the topic of gender-based equality to promote diversity of talent in organizations, improve employee morale, support retention in organizations, and promote an equitable and productive workplace.

It is also worth noting that the essence of this research is rooted in exploring and finding paths to gender equality to ultimately create more inclusive workplaces. Given the lack of gender inclusion in the study, it

is strongly recommended that a full spectrum of gender inclusion and representation in future research is undertaken. Each study that aims to understand gender without also aiming to understand the evolving spectrum of gender commits a disservice to positive social change by creating less inclusive research. An effort to cultivate a deeper understanding of the barriers to gender inclusion, agnostic of a researcher's personal belief and current level of understanding, is inherent in this research and one of our core takeaways from this study.

This study contributes to the broader discussion of gender-based career advancement disparities in technology fields and highlights the importance of regular inquiries into profession-specific career advancement barriers. As society progresses and the product management field continues to evolve, so too must our knowledge base of the contemporary factors that influence career advancement. These findings suggest a need for continued inquiry into gender-based career advancement disparity research. To assume that because law and regulations prohibit gender-based discrimination and equality does not represent the realities of human behavior and organizational support. Through continued research, organizational leaders may be equipped with insights and guidance to make meaningful, mutually beneficial changes for the employee, organization, and positive societal change.

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