



**The Role of Gender and Precarious Manhood on Prospective Specialty
Choices Amongst Medical Students in the Netherlands**

By

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Abstract

This study examines how gender and precarious manhood influence the specialty choices of medical students in the Netherlands. Specifically, it examines whether male medical students are less likely to choose female-dominated specialties and whether their perception of precarious manhood moderates this relationship. A cross-sectional survey was conducted with 227 medical students, who were asked about their preferred specialties. For exploratory purposes, the study also examined participants' least preferred specialty choices and whether precarious manhood moderated that relationship. The findings revealed that male students predominantly prefer male-dominated specialties, with precarious manhood significantly moderating this preference.

In contrast, female students showed a balanced interest in male- and female-dominated specialties. The study concludes that gender stereotypes and societal expectations significantly impact specialty choices, suggesting a need for early educational interventions to address these biases and promote gender equity in medical fields. These insights can help medical schools, and policymakers develop strategies to reduce gender imbalances and encourage a more diverse representation across all medical specialties.

Keywords: Gender Stereotypes, Precarious Manhood, Medical Specialty Choice, Social Role theory, Social Identity Theory

The Role of Gender and Precarious Manhood on Prospective Specialty Choices Amongst Medical Students in the Netherlands

Despite the growing number of female medical students, male medical students continue to avoid female-dominated specialties, making gender balance a significant challenge in all areas of medicine (Pelley & Carnes, 2020). The problem remains: Why are male physicians reluctant to pursue specialties such as pediatrics, obstetrics, and gynecology, predominantly female professions? This reluctance is often due to societal gender stereotypes and might be explained by precarious manhood, which dictates that men must continually prove their masculinity (Vandello et al., 2008). This study examines how these factors influence male medical students' specialty choices.

Certain specialties, like pediatrics and family medicine, are predominantly female because they are traditionally associated with nurturing and caregiving roles, traits culturally considered feminine (Pelley & Carnes, 2020). These fields emphasize patient interaction, communication, and long-term care, aligning with societal expectations of women as caregivers (Pelley & Carnes, 2020). Additionally, these specialties often offer more predictable schedules and work-life balance, historically attracting more women balancing career and family responsibilities (Ng & Leung, 2015). Conversely, male-dominated specialties like surgery or orthopedics are associated with traits such as decisiveness, technical skill, and physical strength, which culturally align with masculinity (Goldstein et al., 2020).

Gender segregation in medical specialties, a reflection of broader societal gender norms and biases, assigns 'masculine' and 'feminine' labels to different fields (Pelley & Carnes, 2020). This societal norm has significant implications, as male medical students may avoid female-dominated specialties due to fears of social stigma, concerns about lower income, and a desire to conform to traditional masculine roles (Tongeren-Alers et al., 2011). While progress has been made in increasing female representation in male-dominated fields, the advancement of men into female-dominated fields has been slower (Tellhed et al., 2016). Social Role Theory and Social Identity Theory offer frameworks to understand these choices, suggesting that societal expectations and personal identity significantly impact career choices (Eagly, 1987; Tajfel & Turner, 1979).

Furthermore, precarious manhood, potentially influencing career choices, proposes that manhood is a social status requiring constant validation. Men who perceive their masculinity as precarious are less likely to choose careers in female-dominated fields, fearing

that such choices may undermine their masculine identity (Vandello et al., 2008; Bosson, 2011).

The current cross-sectional survey study investigates the role of gender and precarious manhood among medical students in the Netherlands. Specifically, it explores how these factors influence the specialty choices of male medical students and their interest in female-dominated specialties. This study is led by the following research question: *To what extent does gender predict medical students' choice of a female or male-dominant medical specialty? To what extent does precarious manhood moderate this effect?*

Gender Stereotypes and Career Choices

Efforts to promote gender equality in education and careers have increased globally, aiming for equal opportunities and representation across all fields. Despite these efforts, significant discrepancies remain, raising essential questions about societal values and the structural factors that maintain gender imbalances, particularly in medical fields (Newman, 2014). Various theories and studies have attempted to explain the reasons behind women's underrepresentation in male-dominated fields such as STEM (science, technology, engineering, and math) (Cheryan et al., 2017; Su & Rounds, 2015). However, significantly less attention is devoted to exploring the factors that might explain men's underrepresentation in specialties traditionally dominated by women, often referred to as HEED (health, education, administration, and domestic) fields (Puzio & Valshtein, 2022).

Gender stereotypes significantly impact career choices, leading to the underrepresentation of men in specific fields and an overrepresentation of women in others (Barth et al., 2017). These stereotypes constrain occupational choices, causing individuals to make career decisions based on gender rather than interest or abilities (Weisgram et al., 2011). Prescriptive and descriptive stereotypes play a significant role in this dynamic. Descriptive stereotypes refer to how men and women are perceived, whereas prescriptive stereotypes dictate the behaviors and roles society expects men and women to conform to (Heilman, 2001). For example, men are expected to exhibit traits such as assertiveness and independence, while women are expected to be nurturing and supportive. These prescriptive norms can discourage men from entering relationship- and care-centered fields, such as pediatrics or family medicine (Heilman, 2001).

Men who enter female-dominated occupations can face negative stereotyping and discrimination, unlike what women experience in male-dominated fields (Torre, 2018). Women often contend with behaviors where individuals in power prefer associating with and

promoting others like themselves - such as men promoting other men. Tokenism is a well-known phenomenon where women are promoted and treated as symbolic representatives of their gender rather than as individuals with unique skills and qualifications (Tabassum, 2021). Men in female-dominated fields typically face prejudice from those outside their profession (Clow et al., 2014). For example, men who become nurses, a profession predominantly dominated by women, are sometimes viewed as deviants, effeminate, homosexual, or even as 'doctor wannabe' (Sasa, 2019).

Social Role Theory

Social Role Theory (Eagly, 1987) explains how societal expectations about gender roles shape behaviors and occupational choices. Historically, men have been seen as providers and women as caregivers, leading to expectations for men to exhibit agentic qualities related to goal attainment and 'getting ahead', and for women to demonstrate communal qualities associated with maintaining relationships and 'getting along' (Abele, 2014; Harrison & Lynch, 2005). These gender roles are maintained through societal expectations and cultural norms, as deviations are often viewed negatively (Kray et al., 2017).

As women increasingly entered the workforce, these gendered expectations influenced the types of jobs men and women pursued (Pelley & Carnes, 2020). This is evident in the medical profession, where certain specialties are perceived as more 'feminine' or 'masculine'. Traditional gender roles influence the field's gender composition and the prestige of different specializations with subsequent benefits such as a higher salary and more grants, demonstrating how societal gender roles can steer career paths (Kutty, 2005). Goldstein et al. (2020) found that men tend to gravitate toward more technical fields, such as orthopedic surgery or neurosurgery, which are associated with high status, technical skills, and long working hours. Because these traits are prevalent in surgical and technical fields that attract more men, they become associated with traditional masculine qualities of competitiveness, consequently attracting fewer women (Goldstein et al., 2020). Conversely, pediatrics and family medicine, seen as less prestigious (Rodríguez et al., 2012), emphasize relationship-building and nurturing traits aligned with more feminine qualities (Beatriz et al., 2023).

Social Role Theory helps explain specialty choice within the medical field, particularly in female-dominated specialties, where traditional roles influence the field's gender composition and the prestige associated with different specializations. This

misalignment with agentic qualities expected of men may deter men from pursuing these specialties (Kutty, 2005). The theory provides a perspective on how societal roles and gender norms might influence specialty choice among male medical students in the Netherlands.

Social Identity Theory

Social Identity Theory (Tajfel & Turner, 1979) provides a framework for understanding intergroup dynamics and how group membership shapes identity and career aspirations. According to Tajfel (1978), social identity refers to how individuals perceive themselves based on their membership in social groups and the emotional significance they attach to these groups. This implies that group membership influences thoughts, emotions, and career choices, making it a core component of self-concept. The theory has expanded to address the interplay between self-concept and group identity, impacting personal and professional identity formation (Hogg, 2016). It explains how social identification with a particular medical specialty influences career decisions. For example, individuals may choose a female-dominated specialty because they identify with this field's communal values and aspects, which align with their self-concept and the social group they aspire to join (Trinh et al., 2020). Conversely, those whose identities do not resonate with such communal traits might steer clear of those fields.

The dynamics affecting women's interest in male-dominated occupations and men's participation in female-dominated occupations impact men differently, especially in traditionally feminine areas (Forsman & Barth, 2016). Stereotypes about necessary skills and personality traits for certain professions influence these dynamics and are affected by gender distribution within occupations (Barth et al., 2015). Research indicates that men are more inclined to conform to societal expectations and prescriptive stereotypes than women (Koenig, 2018). For instance, men in caregiving roles, often viewed as feminine, may feel their masculinity is challenged, prompting men to adhere to traditional masculine norms to avoid potential threats to their masculinity (Barth et al., 2015). This theory provides an essential framework for understanding how social identity and beliefs shape career choices.

Precarious Manhood

While both men and women face adverse reactions to deviating from gender norms, research shows that the effects are more prevalent and severe for men due to the construct of "precarious manhood" (Meeussen et al., 2019). According to Vandello et al. (2008), manhood is characterized as a transient and fragile state, which makes it precarious. Evolutionary theories suggest that men must constantly assert their power and masculinity to

attract mates due to higher competition (Winegard, 2014). Social role theories explain that men's public competitive roles increase the need for public displays of masculinity (Eckes & Trautner, 2000). Research indicates that when men perceive their masculinity as being challenged, they experience heightened anxiety, frustration, and anger, prompting them to demonstrate socially endorsed masculine behaviors (Bosson & Vandello, 2011).

Precarious manhood is related to occupational choices, especially in roles prioritizing work over work-life balance (Vandello et al., 2008). The medical profession, known for its long hours and intensive studying, exemplifies this dynamic (Rich et al., 2016). Women's career choices are more heavily influenced by the need to balance work and family life, while men are scrutinized for attempting the same balance (Berdahl & Moon, 2013). Men who assume caregiving responsibilities at work, such as working part-time or leaving early for childcare, can be perceived as effeminate, weak, and less competent and motivated (Berdahl & Moon, 2013). From a young age, men are conditioned to have lower aspirations to invest in work-life balance, as those who prioritize career over family are praised for their dedication, whereas those who prioritize family are belittled (Berdahl & Moon, 2013). This societal pressure reinforces the precariousness of manhood, compelling men to choose careers that align with traditional masculine norms, characterized by extreme work schedules and constant work availability (Williams et al., 2016).

This Study

This study aims to investigate the influence of gender on specialty choice within the medical field. It will also examine precarious manhood and how it may moderate medical students' career choices, particularly concerning male medical students' interest in female-dominated specialties. Considering the influence of traditional masculine norms and based on the understanding of precarious manhood's potential influence on career choices, the study addresses the following hypotheses:

H1: Are male medical students less interested in choosing female-dominated specialties as their most preferred specialty compared to female medical students?

H2: Does precarious manhood moderate the relationship between gender and choosing a female-dominated specialty?

While the primary hypotheses focused on the medical students' specialty of most interest, the study also explores whether similar patterns appear for the specialty of least interest. Specifically, the study hypothesized that the effect of male medical students' lower interest in pursuing female-dominated specialties and the impact of precarious manhood is

reflected when considering their least preferred specialty. Therefore, two exploratory hypotheses are presented:

H3: Do male medical students show more interest in choosing female-dominated specialties as their least interesting specialty compared to female medical students?

H4: Does precarious manhood moderate the relationship between gender and specialty of least interest?

Understanding the complexities of career decision-making is important, especially given the consistent imbalance in various medical fields. Previous research has explored factors influencing medical students' specialty choices (Levaillant et al., 2020; Yin et al., 2021) but has yet to examine the role of precarious manhood specifically. Additionally, only some studies on precarious manhood and career choices have focused on students, and even fewer have focused on medical students specifically (Meeussen et al., 2019). Moreover, more research must address the reasons behind the lack of interest in particular specialties, especially when considering precarious manhood as a factor. Understanding the intricacies of decision-making when choosing a career is important. Findings from this study, with their potential to inform and shape medical education systems, may contribute to refining these systems, offering potential solutions to address the gender imbalance prevalent in many medical specialties. Exploring interventions that inform the decision-making processes when choosing careers could be a critical step towards educating students, reducing gender segregation in medical fields, and helping address the broader issue of gender imbalance in the career choices of young people in general.

Method

Participants

A total of 257 participants initially began the questionnaire, though not all completed it, leading to a variable sample size. A priori calculation of a t-test comparing the means of two groups using logistic regression, with an estimated medium effect size of 0,5 and a power of 0,8 in G*Power, indicated a minimum sample size of 198 participants. After applying the inclusion criteria of identifying as either a man or a woman and being a medical student, 227 participants remained, of which 52 (22.9%) were men, and 175 (77.1%) were women. The mean age of participants was 22.21 years (SD = 2.81), ranging from 18 to 40 years. Of the 227 participants, 81.1% were Dutch ($n = 184$), 6.2% Non-Dutch European ($n = 14$), and 12.7% reported having another migration background ($n = 29$). Most participants, or 63.9%, were students at Utrecht University ($n = 145$), followed by 13.2% from Maastricht University

($n = 30$) and 7.9% at Radboud University ($n = 18$). The remaining 13.2% of students ($n = 30$) attended other universities in the Netherlands. Most participants were pursuing their bachelor's degree, specifically 63.9% ($n = 145$), 30.8% ($n = 70$) said they were studying for their master's degree, and $n = 9$ chose a different study phase.

Procedure

This cross-sectional field study was part of a broader research project titled “Beyond the White Coat: Who is the Medical Specialist?” measuring various aspects of medical student experiences and perceptions. The study recruited medical students in the Netherlands using convenience and snowball sampling methods. The data for this study were collected as part of a larger research project. Although the questionnaire contained several sections, only the sections on overall background, medical background, and precarious manhood were analyzed for this paper (See questions analyzed in Appendix A). The data collection was conducted by a team of four master's students from April 12 to May 20, 2024. The survey, available in both English and Dutch, was programmed in Qualtrics and administered electronically, taking about 13 minutes to complete. The participants accessed the survey via a link or by scanning a QR code distributed through emails and various social media channels (i.e., LinkedIn, Instagram, WhatsApp, etc.) using the researcher's network. A multi-channel recruitment strategy was used, including emails sent by thesis group members to student associations, information desks, and faculty members, asking them to distribute the survey. Additionally, recruitment posts were made in various WhatsApp groups dedicated to medical students and through direct engagement at the Utrecht University medical student building, Hijmans van den Berghgebouw, where posters and flyers were displayed to facilitate survey access. After completing the survey, participants were offered the chance to enter a draw to win a €50 gift voucher.

Ethical approval was granted by the Board of the Faculty of Social and Behavioral Sciences on April 12, 2024 (Approval No. 24-1453). The survey introduction included a detailed explanation of the study's purpose, procedures, potential benefits, and risks to ensure that all participants were fully informed before participating. Participants had to confirm that they had read and understood the information and agreed to participate before answering the survey questions.

Measures

Demographic & Medical Background Information

Participants were asked to provide information on their gender identity, age, ethnic background, and whether they were studying medicine. They were then asked to specify the year and phase of their medical education (bachelor, master, or other) and the university they were attending.

Choice of Specialty

Participants were presented with a list of medical specialties derived from the Capasiteitsorrgaan (2019) report. The list included 46 specialties, and participants were asked to indicate the medical specialty they were most interested in pursuing. Additionally, they were asked to specify the medical specialty they were least interested in pursuing. Specialties were coded as either female- or male-dominated based on the gender representation of medical specialties.

Precarious Manhood

Precarious manhood was measured using four items adapted from Vandello et al. (2008; Cronbach's alpha = 0,85), which explore participants' beliefs about the stability and challenges associated with manhood. Participants were asked to indicate to what extent they agreed/disagreed with the following statements: "Other people often question whether a man is a 'real man'", "Some boys do not become men, no matter how old they get", "It is fairly easy for a man to lose his status as a man" or "Manhood is not assured - it can be lost.". The average of their responses created a new variable: the average precarious manhood score for each participant.

Interaction Term

An interaction term was included in the analysis to explore whether the relationship between gender and specialty choice is moderated by precarious manhood. The interaction created by multiplying the gender variable with the average precarious manhood score:

$$\text{Interaction Term} = \text{Gender} \times \text{Average Precarious Manhood}$$

This interaction term was added in the final step of the hierarchical logistic regression to test for moderation effects.

Control Variable

The control variable in this study was the duration of participants' medical education. Participants were asked to specify the total number of years they had spent studying medicine. This was a control variable because the length of medical education could influence the medical specialty choice. Students with more experience might have more well-defined preferences based on their clinical exposure and knowledge of different medical disciplines (Kaminski et al., 2021).

Statistical Analysis

All statistical analyses were performed using the Statistical Program for Social Sciences (SPSS). Hierarchical logistic regression was applied to analyze the relationship between gender (man = 1, woman = 0), specialty choice, and the moderating effect of precarious manhood. 'Year of study' was included as a covariate for the potential influence of experience on specialty choice.

For H1, a systematic hierarchical logistic regression analysis was conducted. This approach allowed us to examine the relationship between gender and choice of a female- or male-dominated specialty in a structured manner. The dependent variable was whether the chosen specialty was female-dominated, while the independent variable was gender. The analysis was divided into two steps, with 'year of study' in the first step and gender in the second, ensuring a comprehensive examination of the data.

To test H2, we introduced an interaction term between gender and precarious manhood. This term was added as a third step, with the average precarious manhood score included in the second step. Including this term allowed for the exploration of the potential moderating effect of precarious manhood on the relationship between gender and specialty choice, adding a nuanced layer to our analysis.

H3 and H4 were proposed for exploratory purposes to examine the relationship between gender and the specialty choice of least interest. The hierarchical logistic regression followed the same structure as H1 and H2, except the dependent variable was whether the specialty of least interest was female-dominated. For H3, the analysis included 'year of study' in the first step and gender in the second. For H4, the average precarious manhood score was added to the second step, and the interaction between gender and average precarious manhood was added as a third step.

Results

Descriptive Statistics on Medical Students' Specialty Preference by Gender Dominance

Medical Students' Specialty of Most Interest

The gender distribution of the specialty participants indicated they were most interested in pursuing their medical studies, revealing that 78.8% ($n = 41$) of men preferred a male-dominated specialty. In comparison, 21.2% ($n = 11$) indicated they wanted to pursue a female-dominated specialty. Among women, 54.3% ($n = 95$) preferred a male-dominated specialty, while 45.7% ($n = 80$) chose a female-dominated specialty. These results suggest that a higher percentage of men prefer male-dominated specialties, whereas women show a

nearly equal preference for both female- and male-dominated specialties. Among women, the most popular preferred specialty choice was pediatrics ($n = 30$), and among men ($n = 8$), family/ general medicine.

Medical Students' Specialty of Least Interest

The gender distribution of the specialty participants indicated they were *least* interested in pursuing after their medical studies were also examined for exploratory purposes. When comparing the least preferred specialties, 65.4% ($n = 34$) of men indicated they were not interested in pursuing a male-dominated specialty. In comparison, 34.6% ($n = 18$) indicated they were least interested in pursuing a female-dominated specialty. Among women, 18.9% ($n = 33$) indicated they would be least interested in pursuing a female-dominated specialty, and 81.1% ($n = 142$) chose a male-dominated specialty as the one they were least interested in pursuing. These findings reveal that more men are less interested in pursuing a female-dominated specialty than women.

Conversely, many women indicated being least interested in a male-dominated specialty. Insurance medicine was the least interesting specialty among men and women—table 1 lists what men and women chose as the most and least exciting specialties.

Table 1

Medical Student's Most and Least Interesting Specialty Choices

| Specialty | Specialty of most interest | | Specialty of least interest | |
|---------------------------------------|----------------------------|-----|-----------------------------|-----|
| | Women | Men | Women | Men |
| Allergology | - | - | 2 | 2 |
| Anesthesiology | 1 | 1 | 2 | 0 |
| Cardiology | 7 | 3 | 2 | 0 |
| Cardiothoracic Surgery | 3 | 3 | 2 | 0 |
| Clinical Genetics* | 1 | 0 | 5 | 2 |
| Clinical Geriatrics* | 1 | 0 | 0 | - |
| Dermatology* | 7 | 0 | 6 | 2 |
| Ear-Nose-Throat / otorhinolaryngology | 1 | 2 | 0 | 1 |
| Family Medicine / General Practice* | 16 | 8 | 7 | 1 |
| First-aid Medicine | 7 | 1 | 0 | 1 |

| Specialty | Specialty of most interest | | Specialty of least interest | |
|-----------------------------------|----------------------------|-----|-----------------------------|-----|
| | Women | Men | Women | Men |
| Gastroenterology (MDL) | 2 | 1 | 1 | 1 |
| General Military Medicine | - | - | 7 | 3 |
| Geriatric Medicine* | - | - | 6 | 3 |
| Obstetrics and Gynecology | 15 | 0 | 1 | 2 |
| Insurance Medicine | - | - | 34 | 5 |
| Intellectual Disability Medicine* | 2 | 0 | 7 | 2 |
| Internal Medicine | 13 | 4 | 1 | 2 |
| Microbiology / Bacteriology | 1 | 0 | 6 | 2 |
| Neurology | 5 | 3 | 1 | 0 |
| Neurological Surgery | 4 | 1 | 0 | 1 |
| Nuclear Medicine | 0 | 1 | 2 | 0 |
| Occupational Medicine | - | - | 15 | 2 |
| Ophthalmology | 0 | 1 | 2 | 0 |
| Oral Surgery | 1 | 0 | 2 | 0 |
| Orthopedic Surgery | 0 | 1 | 6 | 1 |
| Pathology | 1 | 0 | 12 | 3 |
| Pediatrics* | 30 | 1 | - | - |
| Plastic Surgery | 1 | 1 | 1 | 2 |
| Psychiatry | 6 | 2 | 0 | 2 |
| Public Health Medicine* | 1 | 0 | 1 | 4 |

| Specialty | Specialty of most interest | | Specialty of least interest | |
|-----------------------------|----------------------------|-----|-----------------------------|-----|
| | Women | Men | Women | Men |
| Radiology | 1 | 1 | 2 | 0 |
| Radiotherapy* | 1 | 0 | - | - |
| Rehabilitation Medicine* | 1 | 0 | - | - |
| Respiratory Medicine | 1 | 0 | 2 | 0 |
| Rheumatology* | - | - | - | - |
| Sports Medicine | 8 | 3 | 3 | 0 |
| General Surgery | 11 | 6 | 14 | 1 |
| Tropical Medicine | 3 | 0 | - | - |
| Urology | 1 | 1 | 1 | 1 |
| Other medical field | 7 | 2 | 2 | 0 |
| Total | 160 | 47 | 154 | 46 |

Note. Specialties marked with an asterisk (*) are classified as female-dominated based on the gender representation data from the Capaciteitsorgaan (2019) report.

Are Male Medical Students Less Interested in Choosing Female-Dominated Specialties as Their Most Preferred Specialty Compared to Female Medical Students? (H1)

The initial model, which included only the constant, correctly classified 100% of male-dominated and 0% of female-dominated specialties, resulting in an overall accuracy of 59.4%. The constant was statistically significant ($\beta = -.379$, $SE = .136$, $Wald = 7.781$, $p = .005$, $\text{Exp}(B) = .684$).

Adding the covariate ‘years of study’ did not significantly improve the model ($\chi^2 (1, N = 227) = .056$, $p = .812$), and it was not a significant predictor ($\beta = -.011$, $SE = .045$, $Wald = .056$, $p = .814$, $\text{Exp}(B) = 0.989$). The model summary for this step indicated no change in overall accuracy (59.4%).

Including gender in the model significantly improved its fit ($\chi^2 (2, N = 227) = 10.807$, $p = .005$). Gender was a significant predictor ($\beta = -1.153$, $SE = .374$, $Wald = 9.499$, $p = .002$, $\text{Exp}(B) = 0.316$), indicating that male medical students were less likely to choose female-dominated specialties than female students. The Nagelkerke R^2 value of 0.06 indicated the model's explanatory power. Hypothesis 1 is therefore supported.

Does Precarious Manhood Moderate the Relationship Between Gender and Choosing a Female-dominated Specialty? (H2)

The initial model, which included only the constant, correctly classified 100% of male-dominated and 0% of female-dominated specialties, resulting in an overall accuracy of 53.8%. The constant was not statistically significant ($\beta = -.152$, $SE = .160$, $Wald = .910$, $p = .340$, $\text{Exp}(B) = .859$).

Adding the covariate 'years of study' did not significantly improve the model ($\chi^2 (1, N = 158) = .498$, $p = .480$), and it was not a significant predictor ($\beta = -.034$, $SE = .049$, $Wald = .472$, $p = .492$, $\text{Exp}(B) = .967$). The model summary indicated no change in overall accuracy (53.8%)

Including gender and average precarious manhood in the model significantly improved its fit ($\chi^2 (3, N = 158) = 9.589$, $p = .022$). Gender was a significant predictor ($\beta = -1.217$, $SE = .428$, $Wald = 8.091$, $p = .004$, $\text{Exp}(B) = .296$), indicating that male medical students were less likely to choose female-dominated specialties than female students. However, average precarious manhood was not significant ($\beta = -.007$, $SE = .173$, $Wald = .002$, $p = .967$, $\text{Exp}(B) = .993$). The model's overall accuracy was 59.5%, with a Nagelkerke R^2 value of .079.

Adding the interaction term between gender and precarious manhood significantly improved the model fit ($\chi^2 (4, N = 158) = 15.151$, $p = .004$). The interaction term was a significant predictor ($\beta = .970$, $SE = .447$, $Wald = 4.713$, $p = .030$, $\text{Exp}(B) = 2.639$), indicating that the relationship between gender and specialty choice is moderated by precarious manhood. The overall accuracy improved to 62.7%, with a Nagelkerke R^2 value of .122. Hypothesis 2 is therefore supported.

Do Male Medical Students Show More Interest in Choosing Female-Dominated Specialties as Their Least Interesting Specialty Compared to Female Medical Students? (Exploratory Analysis)

The initial model, which included only the constant, correctly classified 100% of male-dominated and 0% of female-dominated specialties, resulting in an overall accuracy of 77.2%. The constant was statistically significant ($\beta = -1.221$, $SE = .159$, $Wald = 58.767$, $p < .001$, $\text{Exp}(B) = .295$).

Adding the covariate 'years of study' did not significantly improve the model ($\chi^2 (1, N = 224) = .787$, $p = .375$), and it was not a statistically significant predictor ($\beta = .042$, $SE =$

.046, $Wald = .832$, $p = .362$, $Exp(B) = 1.043$). The model summary for this step indicated no change in overall accuracy (77.2%).

Including gender in the model significantly improved its fit ($\chi^2 (2, N = 224) = 6.706$, $p = .035$). Gender was a significant predictor ($\beta = .877$, $SE = .354$, $Wald = 6.139$, $p = .013$, $Exp(B) = 2.404$), indicating that male medical students were likelier to choose a female-dominated specialty than female students. A Nagelkerke R^2 value of .045 indicated the model's explanatory power. This exploratory hypothesis is, therefore, supported.

Does Precarious Manhood Moderate the Relationship Between Gender and Specialty of Least Interest? (Exploratory Analysis).

The initial model, which included only the constant, correctly classified 100% of male-dominated and 0% of female-dominated specialties, resulting in an overall accuracy of 77.8%. The constant was statistically significant ($\beta = -1.257$, $SE = .192$, $Wald = 43.040$, $p < .001$, $Exp(B) = .285$).

Adding the covariate 'years of study' did not significantly improve the model ($\chi^2 (1, N = 158) = 1.164$, $p = .281$) and was not a significant predictor ($\beta = .054$, $SE = .048$, $Wald = 1.229$, $p = .268$, $Exp(B) = 1.055$). The model summary indicated no change in overall accuracy (77.8%).

Including gender and average precarious manhood in the model significantly improved its fit ($\chi^2 (3, N = 158) = 13.140$, $p = .004$). Gender was a significant predictor ($\beta = 1.308$, $SE = .426$, $Wald = 9.409$, $p = .002$, $Exp(B) = 3.697$), indicating that male medical students were more likely to choose female-dominated specialties than female students. However, average precarious manhood was not significant ($\beta = .284$, $SE = .203$, $Wald = 1.960$, $p = .161$, $Exp(B) = 1.329$). The model's overall accuracy was 77.2%, with a Nagelkerke R^2 value of .122.

Adding the interaction term between gender and precarious manhood significantly improved the model fit ($\chi^2 (4, N = 158) = 14.119$, $p = .007$). However, the interaction term was not a significant predictor ($\beta = -.397$, $SE = .401$, $Wald = .978$, $p = .323$, $Exp(B) = .673$), while gender remained a significant predictor ($\beta = 2.395$, $SE = 1.183$, $Wald = 4.097$, $p = .043$, $Exp(B) = 10.965$). The overall accuracy slightly improved to 78.5%, with a Nagelkerke R^2 value of .131.

These results suggest that gender significantly predicts the choice of female-dominated specialties, and the model's explanatory power improves by including gender and precarious manhood. However, the interaction between gender and precarious manhood does

not add a significant predictive value. This exploratory hypothesis is, therefore, not supported.

Discussion

The main objective of this study was to examine the extent to which gender predicts medical students' likelihood of choosing a female-dominated versus a male-dominated specialty and whether precarious manhood moderates this relationship. Additionally, the study explored the relationship between gender and the likelihood of medical students selecting female-dominated specialties as their least preferred specialty and whether precarious manhood also moderates this relationship. Understanding these dynamics can assist medical schools and policymakers in creating interventions to reduce the impact of gender stereotypes on career choices, thus promoting a more equitable gender representation across specialties.

A clear majority of male medical students who participated in this study preferred male-dominated specialties, with only a few indicating interest in female-dominated specialties. Despite this trend, the most frequent choice among men was family/general medicine, often described as a relationship- and care-centered, and therefore female-oriented, specialty. These findings are interesting as they challenge traditional assumptions about gender preferences in medical specialties (Alers et al., 2014), suggesting that factors other than gender stereotypes may influence career choices among male medical students, or perhaps these preferences have evolved over the last decade. In contrast, female medical students showed a more evenly distributed preference for male- and female-dominated specialties. This suggests that women might be less influenced than men by traditional gender norms when choosing their potential specialty, thus supporting the findings reported by Koenig (2018).

When exploring whether gender influenced the medical students' choice of the least interesting specialty, findings showed that many male students are least interested in pursuing traditionally female-dominated specialties. This avoidance can be attributed to gender stereotypes that label certain specialties as "feminine" (Ng & Leung, 2015), discouraging men from entering these fields due to societal expectations that men should pursue careers that emphasize assertiveness, technical skills, and high-income, which are often associated with "masculine" specialties such as surgery and orthopedics (Goldstein et al., 2020). Conversely, women are more inclined to choose specialties that offer greater flexibility and better work-life balance, which aligns with societal expectations of women as caregivers

(Pelley & Carnes, 2020). These specialties often provide more predictable schedules, attracting more women who balance career and family responsibilities.

These results align with previous research indicating that gender significantly impacts specialty choice (Levaillant et al., 2020; Heiligers, 2012). Men tend to choose high-income, prestigious specialties linked with masculinity, while women prefer specialties offering better work-life balance (Diderichsen et al., 2013; Khader et al., 2008). Societal expectations and gender norms drive these differences, with men avoiding specialties associated with feminine qualities due to fear of negative stereotyping (Barth et al., 2015). Social Identity Theory (Tajfel & Turner, 1979) further explains that men may avoid specialties conflicting with their male identity, reinforcing traditional gender norms (Bosson & Michniewicz, 2013).

While some male students show interest in female-dominated specialties, recent studies suggest shifting stereotypes with female roles becoming more masculine and vice versa (Gustafsson Sendén et al., 2019; Kachel et al., 2016). These results imply that efforts to reduce gender discrimination and cultural barriers in female-dominated specialties could make these fields more appealing to men; similarly, reducing such barriers in male-dominated specialties could attract more women. Additionally, educational initiatives should focus on challenging gender norms that discourage students from considering a broader range of specialties. Despite these changes, entrenched societal expectations still influence specialty choices, highlighting the need to address gender biases and promote inclusivity in the medical field.

Hypothesis 1, which proposed that male medical students are less likely to express interest in pursuing female-dominated specialties than female medical students, was supported. The inclusion of the factor 'years of study' to determine whether a number of years studying medicine affected responses did not improve the model's significance, nor was it a significant predictor, suggesting that specialty preferences are determined early in medical education and are not influenced by additional years of study. This suggests that gender stereotypes might significantly influence specialty preference from the beginning, a finding consistent with existing literature (Alers et al., 2014). These findings highlight the need for early interventions in medical education to incorporate exposure to various specialties to increase diversity in specialty choices among students.

While the overall explanatory power of the model was relatively low, the inclusion of gender as a factor improved its fit, suggesting that gender is meaningful in predicting specialty preferences regardless of the influence of other factors. The negative coefficient for gender revealed that male medical students are less likely to choose female-dominated

specialties than female students, highlighting the influence of gender stereotypes on specialty preference (Barth et al., 2018). These findings further emphasize the need to address gender stereotypes in medical education to promote a more equitable distribution of specialties.

Hypothesis 2, which examines whether precarious manhood (Vandello et al., 2008) moderates the relationship between gender and choosing a female-dominated specialty, was supported. These results showed that the interaction between gender and precarious manhood significantly improved the model fit, indicating that precarious manhood does influence specialty choice. Specifically, male medical students with higher precarious manhood scores were less likely to choose a female-dominated specialty. This suggests that men who perceive their masculinity as more precarious may avoid specialties perceived as feminine to protect their masculine identity. This aligns with Vandello et al.'s (2008) concept of precarious manhood. The findings of this study indicate that men who feel their masculinity is compromised are less likely to pursue careers or activities that are considered female-oriented, further highlighting the impact of societal expectations on career choices. These findings also provide a new perspective on understanding career choices within the medical field, suggesting that the decision-making process for male medical students is not only influenced by traditional gender stereotypes but also by the perceived fragility of manhood.

Two exploratory hypotheses were proposed to examine if the findings from Hypotheses 1 and 2 would also apply to the relationship between gender and specialty considered least interesting by medical students. The findings for Hypothesis 3 revealed that male medical students were likelier to mark female-dominated specialties as their least preferred choice. This provides supporting evidence that gender stereotypes influence the specialties students choose and the ones they avoid. The significant role of gender in predicting the least interesting specialty further supports the notion that societal expectations about gender roles influence medical students' specific choices. The number of years of study had no significant effects on responses, indicating that these aversions are decided early on in medical education and seem stable over time.

Additionally, adding precarious manhood in the model for Hypothesis 4 did not significantly predict the least preferred specialty when interacting with gender. This implies that, although precarious manhood influences the choice of most preferred specialties, its role in determining the least preferred specialties is less prominent. The more substantial influence of gender over precarious manhood in predicting the least preferred specialties highlights the general influence of gender norms and stereotypes throughout the decision-making process.

These findings suggest that early interventions in medical education are important for addressing gender stereotypes and norms as influential factors in the choice of medical specialty. Developing educational programs and policies that challenge traditional gender norms and encourage students to explore all specialties without bias would enhance gender equity in the field. By addressing issues related to masculinity and identity within the context of medical education, it may be possible to broaden students' perceptions of suitable specialties and reduce the impact of precarious manhood on specialty selection.

Strengths & Limitations

A notable methodological strength of this study was the use of an established and validated scale for measuring precarious manhood (Vandello et al., 2008), ensuring the reliability and validity of this key variable. Furthermore, the classification of medical specialties into male- and female-dominated categories was based on data from the Capaciteitsorgaan (2019), which provides authoritative and up-to-date guidance on workforce needs in healthcare, adding credibility and relevance to examining specialty preferences among medical students. Additionally, the study included a comprehensive range of specialty preferences, providing a detailed overview of the student's preferences and aversions.

However, a limitation of the study is the small number of female-dominated specialties available for selection. This imbalance in the number of specialties could have influenced the results, as the preference for male-dominated specialties might be partly due to the limited options available in the female-dominated domain. Consequently, the finding that male students are less likely to choose female-dominated specialties does not necessarily imply a lack of interest; it may simply reflect the limited availability of such specialties. This structural limitation within the dataset could have skewed the preferences observed, highlighting the need for future research to consider more balanced specialty options.

Another limitation is that the study's sample consisted solely of students in the Netherlands, which limits the generalizability of the findings to medical students in other countries. Consequently, the result may only partially apply to students from different educational systems, cultural backgrounds, or healthcare environments outside the Netherlands. Finally, researchers had limited access to medical students in the Netherlands, which might have limited the diversity and size of the sample. Despite efforts to recruit a gender-balanced sample, the current sample was overwhelmingly female. Literature suggests that women are more likely to participate in surveys (Sato et al., 2013), which may have

introduced a gender bias in responses. Moreover, it was unfortunate that critical questions for this part of the survey were placed in the latter half of the questionnaire, likely contributing to participation dropout and reducing the final sample size.

Future research should aim to recruit a more balanced sample to ensure the findings represent both male and female medical students. Additionally, expanding the study to include students from various countries and diverse cultural backgrounds would enhance the generalizability of the results. With that being said, the findings from this study offer insights for medical educators and policymakers to address gender biases and stereotypes in medical training programs, potentially leading to a more balanced gender representation in various medical specialties.

Conclusion

Ensuring that both men's and women's perspectives are represented in all fields of medicine is vital for achieving comprehensive and equitable healthcare. The study aimed to examine the influence of gender and precarious manhood on the specialty choices of medical students in the Netherlands. The findings indicate that male students predominantly prefer male-dominated specialties. Still, female students showed a more balanced preference for both male- and female-dominated specialties, suggesting a lesser influence of traditional gender norms. Gender significantly predicted specialty choice, with male students less likely to choose female-dominated specialties. At the same time, precarious manhood further influenced these choices by discouraging men who perceive their masculinity as precarious from selecting female-dominated fields.

These results highlight the need for early educational interventions to challenge gender stereotypes and promote a more equitable distribution of specialties among medical students. However, the study's limitations, including a sample limited to the Netherlands and an imbalance in the number of female-dominated specialties, suggest that future research should aim for more diverse and balanced samples to enhance generalizability. Addressing these factors can help develop strategies to reduce gender biases in medical career choices, contributing to a more diverse and inclusive healthcare workforce.

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Appendix A

Survey Questionos

Medical_Student_Survey_MasterThesis2 023_2024

intro **Welcome to the Survey: "Beyond the White Coat: Who is the medical specialist?"**

Thank you for your interest in participating in this short survey entitled: "*Beyond the White Coat: Who is the medical specialist?*". The purpose is to learn more about medical students' thoughts on the typical traits and behaviors that they believe are important to become a successful medical specialist. Information from this survey will provide valuable input to better understand medical students' perspectives on the landscape of medicine in the Netherlands.

For this, we need your participation!

What will I do in this survey?

Participating in this survey will take about 10-13 minutes of your time. In the survey, we will first ask some questions about your demographic background, such as age, gender, and migration background. We use this data to describe our sample and analyze whether there are different patterns between groups. We will furthermore ask you questions about your studies in medicine such as at what stage you currently are in and what your current medical specialty of interest is. After that, we will ask you questions about what you believe to be important traits and behaviors that characterize the successful medical specialist. Finally, we ask you some questions about your future career and perception of the work culture in medicine.

What are the terms of participation?

You can participate in this research if you are 18 years old or older. Note that all your answers are completely anonymous and cannot be traced back to you personally. For every question, you may opt not to answer. Participation in this survey is entirely voluntary; you may stop participation at any desired moment, without any consequence. Needless to say, the quality of the data will be better if you complete the survey entirely. Note that you cannot return to previous pages in this survey to change your answers. Please fill out this short survey in one sitting. If you complete the survey, you will have the chance to win a gift voucher in the amount of 50 euros. If you end your participation before completing the survey, you will not be able to enter yourself into the lottery to win a gift voucher.

What happens to the data?

Your data are strictly confidential and will be processed in accordance with the privacy rules and the data storage protocol of Utrecht University. This means that your responses will be stored (at least 10 years) on a UU faculty server without personal identifiers, ensuring they cannot be traced back to you personally. If you opt into the

raffle to win a gift card, a separate questionnaire will collect your email address. This ensures that your email is stored in a distinct dataset, separate from your survey data, guaranteeing that your survey responses remain anonymous and cannot be linked to your email address. Results from data analyses will only be reported at aggregate group levels (of at least 10 individuals), not at the level of individual participants. Reported results will thus never be traceable to individual employees. The results will be used for educational purposes and potentially for publication in scientific peer-reviewed journal articles. The results will not be used to evaluate individuals in any way. The research receives funding via an NWO-funded PhD project at the Social- Health, and Organizational Psychology department at Utrecht University. This survey was approved by the Ethics Committee of the Faculty of Behavioral and Social Sciences (code: 24-0181). The Principal Investigators of this research project are MSc. Johanna Kruger, Dr. Melissa Vink, Dr. Ruth van Veelen, & Prof. Dr. Belle Derks.

What if I have questions/comments?

In case of questions or comments on this survey, please contact: j.s.w.kruger@uu.nl. If you want to contact an independent researcher (not part of this research project) at UU, please contact: e.m.j.aarntzen@uu.nl. For formal complaints, you can use the email address of the complaints officer klachtenfunctionaris-fetcsocwet@uu.nl.

Have you read the conditions of participation, and do you accept them?

- Yes**, I have read and understood the information above. I agree that my data is processed for the stated research aims, and will participate in this survey (standard response) (3)
- No, I do not accept these conditions and will not participate in this survey (NB: if you opt for this response this will terminate your participation) (4)

intro_block2 **The first questions relate to your demographic and study background.**

Gender What is your gender identity?

- Man (1)
- Woman (2)
- Non-binary (3)
- Please specify if your gender identity is not listed here: (4)

- I'd rather not say (5)
-

age **What is your age?**

Ethnicity **What is your ethnic background (i.e., migration background)?** Multiple answers are possible.

- Dutch (1)
- Turkish (4)
- Moroccan (5)
- Surinamese (2)
- Dutch Caribbean (e.g., Aruba, Curaçao, Sint Maarten, Bonaire, Sint Eustatius, Saba) (11)
- Indonesian (10)
- Non-Dutch European (EU/EEA/Switzerland) (9)
- Please specify if your ethnicity is not listed here (8)
-

Med **Do you currently study medicine?**

- Yes (1)
- No (2)

Stage_Degree **What phase of medical school are you currently in?**

- Bachelor's (10)
- Master's (11)
- Other, namely... (9) _____

Stage_Years **How many years have you been studying medicine overall?**

Location_Uni At which university do you study medicine?

- University of Utrecht (UMC Utrecht) (16)
- Erasmus University Rotterdam (Erasmus MC) (1)
- Leiden University (LUMC) (11)
- Maastricht University (MUMC+) (12)
- Radboud University Nijmegen (Radboudumc) (13)
- University of Amsterdam (Amsterdam UMC, location AMC) (14)
- University of Groningen (UMCG) (15)
- Vrije Universiteit Amsterdam (Amsterdam UMC, location VUmc) (17)
- Other, namely... (2) _____

MedSpec_Interest **What medical specialty are you currently most interested in pursuing in the future?** *It's not necessary to think long about your answers; just opt for the first answer that comes to you if you had to choose right now.*

(Choose 1 from the list below; Dutch version listed in alphabetical order)

- General military medicine (12)
- Allergology (43)
- Anesthesiology (1)
- Intellectual Disability Medicine (45)
- Occupational Medicine (21)
- Cardiology (2)
- Cardiothoracic surgery (3)
- General Surgery (36)
- Dermatology (7)
- Geriatric Medicine (13)
- Family Medicine / General Practice (9)
- Internal Medicine (16)
- Oral surgery (23)
- Ear-Nose-Throat (ENT) / otorhinolaryngology (8)
- Pediatrics (26)
- Clinical genetics (5)
- Clinical Geriatrics (6)
- Respiratory Medicine (47)
- Gastroenterology (MDL) (11)
- Public Health Medicine (46)

- Microbiology / bacteriology (17)
 - Neurology (18)
 - Neurological surgery (19)
 - Nuclear medicine (20)
 - Ophthalmology (22)
 - Orthopedic surgery (24)
 - Pathology (25)
 - Plastic surgery (27)
 - Psychiatry (28)
 - Radiology (31)
 - Radiotherapy (32)
 - Rheumatology (34)
 - Rehabilitation Medicine (33)
 - First aid Medicine (Accident and Emergency medicine) (10)
 - Sports Medicine (35)
 - Tropical Medicine (37)
 - Urology (38)
 - Obstetrics and Gynecology (14)
 - Insurance Medicine (15)
 - Other medical field (not listed), namely... (39)
-
-

MedSpec_NotInterest **What medical specialty are you the least interested in pursuing in the future?**

It's not necessary to think long about your answers; just opt for the first answer that comes to you if you had to choose right now.

(Choose 1 from the list below; Dutch version listed in alphabetical order)

- General military medicine (12)
- Allergology (43)
- Anesthesiology (1)
- Intellectual Disability Medicine (45)
- Occupational Medicine (21)
- Cardiology (2)
- Cardiothoracic surgery (3)
- General Surgery (36)
- Dermatology (7)
- Geriatric Medicine (13)
- Family Medicine / General Practice (9)
- Internal Medicine (16)
- Oral surgery (23)
- Ear-Nose-Throat (ENT) / otorhinolaryngology (8)
- Pediatrics (26)
- Clinical genetics (5)
- Clinical Geriatrics (6)
- Respiratory Medicine (47)
- Gastroenterology (MDL) (11)

- Public Health Medicine (46)
 - Microbiology / bacteriology (17)
 - Neurology (18)
 - Neurological surgery (19)
 - Nuclear medicine (20)
 - Ophthalmology (22)
 - Orthopedic surgery (24)
 - Pathology (25)
 - Plastic surgery (27)
 - Psychiatry (28)
 - Radiology (31)
 - Radiotherapy (32)
 - Rheumatology (34)
 - Rehabilitation Medicine (33)
 - First aid Medicine (Accident and Emergency medicine) (10)
 - Sports Medicine (35)
 - Tropical Medicine (37)
 - Urology (38)
 - Obstetrics and Gynecology (14)
 - Insurance Medicine (15)
 - Other medical field (not listed), namely... (39)
-

Precarious_manhood **Regardless of your gender identity, we are curious to hear about your thoughts and feelings related to masculinity and manhood.** Please indicate on a scale from 1 (not at all) to 5 (definitely) to what extent you believe each statement is true.

| | Not at all 1 (1) | 2 (2) | 3 (3) | 4 (4) | Definitely 5 (6) |
|---|----------------------------|-----------------------|-----------------------|-----------------------|----------------------------|
| Other people often question whether a man is a 'real man' (4) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Some boys do not become men, no matter how old they get (5) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| It is fairly easy for a man to lose his status as a man (6) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Manhood is not assured—it can be lost (7) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

End **This is the end of this survey! Many thanks for your time.**

If you still have questions or comments about this survey, you can state them below.

You can also contact: j.s.w.kruger@uu.nl To save your responses and enter yourself in the 50 Euro gift card raffle, please click the [>>] button.

End of Block: end

Start of Block: reward

reward As a thank you for participating in our study, you have the chance to win a €50 gift card (Yesty), which can be used at many different stores (e.g., Bol.com).

- I want to enter the raffle to win a €50 gift card (1)
- I do not want to enter the raffle (3)