"It creates a divide": minoritized medical students' perceptions of professional identity formation

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Abstract

Background: If the task of professional identity formation (PIF) is for the trainee to become acculturated to a specific set of professional values, trainees whose individual identities are already closely aligned with the hegemonic values of medicine might be expected to have an easier PIF process than those trainees who begin their acculturation with individual values that are quite different than the prevailing values in medicine. **Method:** The present cross-sectional qualitative study examines the PIF experience of 15 medical students who face a range of structural inequalities and cultural constraints in a rural, predominately white medical school setting. **Results:** Five themes emerged from interviews: 1) participants' decision to enroll in medical school was substantially influenced by family and broader community; 2) participants' expectations about starting medical school were not met; 3) participants perceived they were different from other medical students and also from the stereotypical physician; 4) participants felt pressure to adjust their personal identity; and 5) participants drew from personal identities to cope with stress. **Discussion:** These qualitative findings suggest that many participants felt their identity was often an asset in connecting with patients. Concurrently, participants felt a responsibility to return to practice in their home communities, which may represent a unique burden. Furthermore, some felt pressure to compromise or change their individual identity to be successful in medical culture. The task for medical schools may be to help students view their identities as a unique advantage, rather than something they need to quell or minimize to be successful.

Keywords: undergraduate medical education; professional identity formation; underrepresented in medicine; qualitative methodology; critical theory

Introduction

Professional identity formation (PIF) is the "integration of the knowledge, skills, values and behaviors of a profession with one's pre-existing identity and values." [1] PIF in medicine begins in the pre-professional period, continues throughout the career, and is a complex, multidimensional, transformative process[2] that requires the trainee to become aware of, accept, and eventually internalize the values and culture of medical education and practice.

As a social institution, the values and culture of medicine "emerged out of a specific socio-historical context and are motivated by socio-historically defined priorities."[3]

Thus, the white men who led the historical development of medicine as a profession in the United States[4,5] inadvertently contributed to making access to medical education and the medical profession harder for the poor, women, and Black people.[6,7] This dominant group continues to occupy the majority of leadership roles in medicine in the U.S. today,[8–10] despite some improved representation related to gender.[8] The American culture of medicine was thus created—and continues to be largely perpetuated by—those with the most social, cultural, ideological and economic influence. This powerful group is the hegemonic group, where hegemony is the dominance of one group or set of ideals over another. If the task of PIF is for the trainee to

become acculturated to medicines' values, trainees whose individual identities are already closely aligned with the hegemonic values of American medicine might be expected to have a different, perhaps easier, PIF process than underrepresented in medicine (UIM) trainees.

Most empirical literature has tended to focus on a generic experience of PIF in medicine, without considering that trainees of different backgrounds may have unique experiences. A recent meta-ethnography of the PIF literature concluded that there was "a major gap in the research literature in that although medical education recognizes the challenging social and learning environments faced by [minoritized] physicians… the PIF literature has not elucidated the factors that play a role in their PIF."[11] Thus the multitude of intersecting identities and contexts that exist outside of medicine are mostly ignored, and every student is assumed to begin from the same starting point. A better understanding of PIF for minoritized populations could benefit minoritized medical students, as institutions would be more able to meet their unique needs and potentially ease additional professionalization burdens these students may experience.

Early efforts to address this have included research involving semi-structured interviews with 25 diverse academic medicine physicians,[12] interviews with 38 first-year medical student women,[13] a cross-case analysis involving minoritized physician assistant students and Black physicians[14] and interviews with 14 Black medical students.[15] Taken together, these studies conclude that PIF is different for minoritized students than for students who are part of the hegemony.

There remains room for a deeper understanding of the experience of PIF for minoritized populations. The scant literature that exists focuses on gender and race, however there are many other ways of being minoritized in medicine, such as socioeconomics, LGBTQIA+, differing physical and cognitive abilities, and religion. Additionally, there are many different educational contexts that likely impact an individual trainees' experience of PIF.

The aim of this study is to help fill this gap by examining the PIF of U.S medical students who are training in a rural, predominately white medical school setting. Our study is grounded in critical theory, which asserts that phenomena are influenced by larger hegemonic and ideological forces, and interrogates the role power, privilege and oppression play in the lived experiences of people.[16–18] Critical theory is thus an ideal framework for this study as medicine broadly—and explorations of the UIM experience particularly—are intimately related to power and hierarchy.

Methods
Study Design
This study presents a subset of data being collected as part of a larger, ongoing longitudinal qualitative study using a phenomenological approach to explore the lived experiences of 38 minoritized medical students. The present study presents 15 interviews from the first of up to six interviews across three years. Each interview explores the students' experience of PIF in their current developmental context. Each timepoint has unique and discrete themes, so the data is being presented by timepoint. The study is being conducted at the Penn State College of Medicine and was approved by the Penn State College of Medicine Review Board (study ID 12082).

Participants and Recruitment
Study participants were first-, second-, and third-year medical students at a suburban U.S. institution that provides tertiary care for a largely white and rural catchment area. From 2014 to 2018, the entering medical school classes (144 to 152 students,) included 9 to 25 students who identified as minoritized, which is lower than average at [institution].[19,20]

Students were eligible to participate if they self-identified as being members of at least one underrepresented group in medicine (e.g., minority racial/ethnic group, LGBTQIA+, first generation college student). An email describing the study and inclusion criteria was sent to all first, second-, and third-year medical students. Fifteen first-year students, fourteen second-year students, and nine third-year students agreed to participate in up to six in-person one-on-one interviews across three years, exploring new topics and contexts that emerge as training progresses. Each participant received a $20 gift card for each interview.

Purposive Sampling
This cross-sectional study included 15 volunteers who were purposively sampled from the larger cohort based on their year in medical school at study initiation (5 first years, 5 second years, and 5 third years) and to maximize variability in minoritized status (e.g., race, gender, religion). Permission from medical school leadership was granted to email the medical students for recruitment purposes. Table 1 shows the characteristics of sampled participants; their minoritized attributes were extracted from transcripts.

Table 1: Characteristics of Sampled Students

Participant Number	Medical School Year	Gender	Minoritized Attributes
010	First	Man	Religious minority, first generation
012	First	Woman	LGBTQIA+, low SES
014	First	Woman	Low SES, religious minority
019	First	Woman	Religious minority, first generation
020	First	Woman	Born outside USA, racial/ethnic minority, first generation, low SES
023	Second	Man	LGBTQIA+, racial/ethnic minority, low SES, born outside USA
024	Second	Woman	Religious minority, racial/ethnic minority, born outside USA
029	Second	Woman	LGBTQIA+, religious minority, racial/ethnic minority
031	Second	Woman	Racial/ethnic minority, low SES
033	Second	Man	Disability
002	Third	Woman	Racial/ethnic minority
003	Third	Man	LGBTQIA+, racial/ethnic minority
004	Third	Man	Racial/ethnic minority, first generation, low SES
005	Third	Woman	Racial/ethnic minority, low SES
006	Third	Man	Low SES, first generation

We chose a cross-sectional study design because our goal was to broadly examine and characterize the experience of PIF for a variety of minoritized medical students across the various phases of medical education.

Interviews

Interviews were conducted in a private room on the University campus by an UIM MD/PhD student trained in qualitative interviewing (initials). We strategically chose a status and role concordant interviewer to facilitate a comfortable relationship and open and honest communication with participants. The interviewer followed a semi-structured interview guide (Appendix A) to explore professional identity, social isolation, and self-view. Interviews (ranged 35 to 65 minutes) were audio recorded and transcribed verbatim. Attention to COREQ guidelines, including reflexivity statements, are available in Appendix B; coding tree in Appendix C.

Qualitative Analysis

Our interpretive framework was critical theory, which is useful for exploring the relationship between race, racism, and power.[21,22] We used an inductive, phenomenological approach[23] to thematic analysis[24] in order to explore the lived experience of UIM students. Analysts were trained qualitative analysts (author initials). First, analysists reviewed 6 transcripts and inductively generated categories and codes that emerged from the data. The final codebook contained 9 categories and 67 discrete codes; definitions were created for each code. Data saturation for top level codes was achieved after review of 6 transcripts. Then, two analysts (author initials) coded the remaining transcripts using MAXQDA 2020 qualitative software.[25] An interrater reliability standard of >.70 was set as the pre-determined goal Cohen's Kappa statistic. Coding reports were used to identify and resolve coding discrepancies (final kappa was .75). Transcripts, coding reports, and patterns were then reviewed by the lead researcher (author initials) who generated themes, subthemes and representative quotations which were discussed and finalized with the full team.

Results

Fifteen interviews were conducted with first (n=5), second (n=5) and third (n=5) year medical students. Characteristics of the interviewees are shown in Table 1. Five themes emerged (Figure 1). Participants are identified via a three-digit number (e.g., 033).

Figure 1: Themes and sub-themes

1. Participants' decision to enroll in medical school was significantly influenced by family and broader community

1. Family members who were healthcare providers played a prominent role in decisions to go to medical school
2. Women participants described their family as less supportive of medical school
3. Giving back to home community was an instigator for medical school

2. Participants' expectations about medical school, in particular the rigor of classes and finding a friend group, were not met

1. Medical school less intense and more manageable than participants expected
2. Finding a friend group was important, but not quick or easy

3. Participants perceived they were different both from other medical students and from the stereotypical physician

1. Lack of diversity in the school and surrounding community noted
2. Many expressed concern about not fitting in, and feeling different
3. Participants viewed their difference as an asset
4. Participants perceived that they were very different from the stereotypical, and typical, clinician

4. Participants feel pressure to adjust their personal identity for the sake of achieving perceived ideal professional identity

1. Participants had high aspirations for their future physician identities
2. Participants felt pressure to change their personal identity to be successful in medical school

5. Participants drew from personal identities and experience as part of their coping mechanisms for hardships or stressors in medical school

1. Friends, significant others, family, and home community played an important role
2. Activities such as music, art, exercise and religion supported well-being

1. Participants' decision to enroll in medical school was significantly influenced by family and broader community. Participants described that family members who were healthcare providers played a prominent role in their decision for medical school.

> *My mom was an OR nurse in [South America] and she was training in nursing [...] She was a caregiver all her life. [...] So I got a lot of, um, nurturing and just caregiver qualities from her.* (004)

> *I was in a fairly medically-minded household. My father was a physician, my mother also was a pharmacist for a long time, too. So I was immersed in that environment.* (033)

Three women, one-third of the women participants in this study, described that their family was less supportive of the decision to enroll in medical school, largely due to their parents' gender role expectations:

> *When I decided that maybe I wanted to try medical school instead [of nursing school] that rocked the boat a bit. Because it wasn't something that they thought a women could be capable of or should [do], in terms of sacrificing family life and things like that.* (014)

These gendered expectations are part of larger socio-historical contexts that proscribes what it means to be a woman, and woman physician.

In addition to the family's influence, many participants noted that giving back to their home community was a key motivator for medical school. Participants articulated a sense of service, wanting to act as an advocate for the community they came from:

> *[In the country of my birth] we don't have health insurance, so it's super expensive. People who live in poverty, they basically have no hope. Like if they can't pay for it, they just suffer through it. [...] My ultimate goal is to open a few free clinics there in some rural areas.* (024)

> *Specifically, I see needs in my community.... because we don't get a lot of higher education...people tend to distrust professionals and institutions, including the government. [...] I want to be in family practice, and I want to work with [religious minority].* (010)

Theme 2. Participants expectations about starting medical school—in particular regarding the rigor of classes and finding a friend group—were not met.

Participants reported expecting medical school to be extremely intense but found that it was manageable.

> *I had expectations of being busier than I am. Like I had worst case scenario in my mind planned out and…that's not necessarily the case actually.* (019)

> *I think I expected [classes] to be more draining than [they] are. Like, it's hard, but I think I expected it to be constantly hard….to constantly feel drained and exhausted, and I think instead it just comes in waves.* (029)

They additionally noted that finding a friend group was extremely important, but it did not happen quickly or easily.

> *I feel like there's less people that I have things in common with, but, um, I'm still trying to find my place and fit in.* (020)

> *I haven't really connected with people as well as I would like, especially in [comparison to] undergrad.* (023)

Participants noted how College-sponsored diversity, equity and belonging groups played an instrumental role in eventually forming friendships. Most of the second- and third-year participants described having ultimately identified a group of friends, and noted that their group was not necessarily filled with people who shared their specific background, but tended to be minoritized in some other way:

> *I've been able to share my culture a little bit with my friends. My friends here are also from really diverse backgrounds. Like my roommate is from Syria…all my other best friends are Egyptian or Iranian. …And so we understand our cultural differences. But, at the same time, we also don't overthink differences of our backgrounds. I mean, I do wish that I had more friends and stuff from [racial/ethnic minority culture] here so they understand my food interests a lot more, or understand why I do things differently or say things weird. It's just a part of my culture.* (005)

> *You find your group of friends and…slowly…you all get beaten down by the same things, like as a unit, you kinda all meld into one squadron of people who have just been through a lot.* (006)

Theme 3. Participants perceived they were different from other medical students and from the dominant stereotype of a physician. This perception was partially informed by a noted lack of diversity in the school and surrounding community.

> *Moving here to [rural location], um, it was a big change for me 'cause I… I guess the diversity is way less than I was used to." […] And so I guess I did feel kind of out of place.* (024)

> *I don't think this area's very diverse, so I think there's a lack of cultural connection with a lot of my classmates.* (029)

Participants noted that there were few people 'like them.' This was a change for many, who had become accustomed to more diverse settings during baccalaureate training. Although some participants had expected the environment to be relatively homogenous, for others, it had been an unwelcome surprise.

> *I guess it didn't really sink in that it may not be exactly what I was used to …I guess I thought I would be able to find [my] niche here, but so far I haven't.* (012)

As a result, many expressed concerns about not fitting in. Participants shared stories about expending energy educating colleagues about their culture and attempts to meet social expectations that did not come naturally. Some participants unequivocally felt they did not fit, with one participant stating, "*I do not feel like one of them*" (010). Another student, after being asked how well they fit in with their medical school classmates, responded in this way: "*[pause 5 seconds] uh [pause 5 seconds] not too well*" (006).

Participants reported "feeling different" with regards to race and sexuality, but also regarding other topics such as appearance and finances.

> *When topics like diversity and race and social justice would come in [the curriculum]…it creates a divide, makes you feel very separate.* (002)

> *I do feel kind of weird because I'm larger than most of my classmates. Everyone is smaller, skinnier frames, and then I'm just like a very big (laughs) presence. 'Cause most of the women in my family are just larger and we live a long time too. […] I'm kinda like, feel like a monster among all my peers.* (031)

> *A lot of people haven't had to deal with severe financial issues, or even provide money for themselves, let alone for their family. Um, which is good. I don't want that for anyone..* (006)

These findings are aligned with critical theory, which suggests that ideological forces about what is "normal" or "right" are deeply rooted within the framework of American society and are not easily explicated or eradicated.[18,26]

Many participants viewed their differences as an asset, something that helped them connect to patients:

> *I've actually found that these intersecting identities have been more helpful in connecting with people than they have been harmful because when you recognize all these different identities then you can be like, "Oh I'm also similar in this way. (023)*

> *The idea of color definitely plays a role too, and when I see [Country] patients it's like…that same affection, a certain love. That like, people that you share similar cultures to. […] I feel like my background's helped cause honestly, um, when it comes to patient care, it's helped me more than hurt me. (004)*

Finally, participants also felt different from the stereotypical, and the typical, clinician. Participants had overwhelmingly negative views about clinicians generally, including that the typical clinician does not listen well, is disengaged, forgets that patients are whole people, and has poor communication skills.

> *All my interactions have been either doctors thinking they know more than you, being rude about it, um, not really listening, or like not validating any concerns.* (029)

> *…I've heard a lot of, "oh, my doctor doesn't really care about me. I had to change my doctor 'cause, you know, he was just trying to make money off me. He doesn't really help me." (006)*

Additionally, three participants identified a white man as the stereotype of a physician, and another student noted that the stereotypical physician has never been through any hardship, describing him/her as: "*Some rich person who doesn't care about outcomes and just goes in and sees the patient or makes money off them and just goes onto the next one."* (006) These minoritized participants have thus internalized the hegemonic norms that suggest that the well-educated and respected physician is a white man.

Theme 4. Participants feel pressure to adjust their personal identity for the sake of achieving the perceived ideal professional identity.
Participants had high aspirations for their future physician identities. When reflecting on their ideal physician identity, participants said they wanted to: connect with every patient, be an advocate, be oriented toward their patient's culture, serve others, listen empathetically, be open-minded, emphasize compassion and trustworthiness, be humble, and be someone their patient's feel comfortable with.

> *[The ideal is] being compassionate and being willing to learn about experiences outside of your own. […] I don't want to limit any patient based on what my expectation or interpretation of their situation is. (014)*

> *Ideal for me is just, you know, someone who is extremely empathetic, who is smart but doesn't have to be the smartest person, who cares a lot about patients and people, and who works really well in teams. …and, you know, are just like passionate about what they do. (005)*

With this ideal professional identity in mind, participants expressed feeling pressure to change their personal identity to succeed in medical school, with one student noting that *You lose parts of yourself that used to be so central to your identity. (029)*

> *As I'm trying to decide on what my professional identity is, I have to maybe just adjust my personal identity. (005)*

Most participants identified that they were still navigating the conception of their ideal professional identity, with one student noting, "*I haven't really figured out what I want my professional identity to look like*" (005) and another saying, "*I'm still figuring it out, how to make this work.*" (020)

Theme 5. Participants drew from personal identities and experience as part of their coping mechanisms for hardships or stressors in medical school. This included connecting with family and significant others, who served as sources of support; practicing their religion; and "venting" to friends who could "relate":

> *If I can get away and, um, spend some time with my community. (010)*

> *I think family is a big support. Like, family and friends are a big support system that I feel like if I didn't have I would go crazy. It's good to just go outside of medical school and talk to other people. (024)*

Participants reported many specific modalities that promoted their well-being, including listening to music, playing a musical instrument, going to concerts, painting, cross-stitching, writing poetry and "*dancing and singing*" (004). Exercise was also key, with several participants identifying intramural sports, long runs, and martial arts as helpful for their well-being when things got difficult. Several participants reported turning to their religion as a source of support:

I always try to like, go back to scripture. I read and do devotionals because otherwise I would be like, what's even the point? Like why am I here? This is crazy. And so I get grounded in that and just find strength in, God, honestly. (019)

Prayer really helps cause for that [Gastrointestinal] exam I was like, "I'm pretty sure I failed this exam." [...] What is God trying to teach you with this? Is kind of how I go about doing things. So that really helps. (031)

Discussion

This study presents qualitative data from semi-structured interviews to better understand the PIF experience of minoritized medical students. We found that participants' decision to enroll in medical school was significantly influenced by their family and community, and that during their first year of medical school participants had trouble finding a trusted group of friends. Participants perceived they were different from other medical students and from the stereotype of a physician. Despite advantages interacting with minoritized patients, participants felt pressure to adjust their personal identity for the sake of achieving the perceived ideal—and typical—professional identity. Finally, our findings show that participants drew from their personal identities and experience as part of their coping mechanisms for hardships or stressors in medical school.

Thus, on one hand, the minoritized medical student identity was often an asset in connecting with patients, a finding that aligns with recent research which suggest that the same is true for minoritized academic physicians.[12] On the other hand, a minoritized identity may represent a unique burden: a perception that they need to return to their home communities to take care of the people there. Furthermore, some participants reported feeling as though they did not belong at home or at school. Participants perceived that their identity made them different and felt pressure to compromise or change their individual identity to be successful in medical culture. Our qualitative data suggests that the task for medical schools may thus be to help ensure that students view their identities as a unique advantage, as opposed to something they need to quell or minimize to be successful. One step that medical schools can take is to show trainees many different 'ways of being' a medical professional.

These qualitative findings suggest that the students' PIF is dependent on both the individuals' identity and also upon the specific context of the medical school and surrounding geographical region. At a historically white, rural-suburban setting like [institution], minoritized students perceived a lack of diversity not only in the school but also in the surrounding community. For example, the relative lack of ethnic barbers, grocery stores, or restaurants may have contributed to participants' feelings of isolation. Within the College of Medicine itself, the relative lack of diversity within the student body made it harder to find friends, and when the required Health Humanities curriculum – which is generally highly rated—included social justice topics, underrepresented students sometimes reported feeling alienated. To better understand the experience of PIF for diverse students, we have previously called for medical student sociodemographic variables to be meaningfully included in studies of PIF;[27] the present findings suggest that researchers should also include a rich description of their schools' regional and cultural makeup.

The UIM students in this study generally followed Cruess's[28] schematic representation of PIF, whereby existing personal identities are merged through socialization with professional identities. The difference is *how* this process occurred: the participants in this study reported encountering numerous challenges in integrating their personal and professional identities, including struggling to find a friend group, feeling as though they did not fit in, and experiencing pressure to change their deeply-held personal identities. Indeed, Cruess acknowledges that not everyone will proceed through PIF lockstep, and that UIM trainees may experience "tension" as they try to hold on to their own identity while simultaneously internalizing the norms of what was in the past an exclusionary profession.[28] The present study contributes to the growing empirical evidence[12–15] that Cruess´s theoretical assertion was correct—UIM students *do* report struggling with the PIF process.

For too long we have accepted that the culture of medicine is fairly set, and that to be successful medical students should adapt to medical culture. Although acculturation by the student to the values and traditions of medicine is a necessary component of PIF, we ought to be concurrently encouraging—even demanding—change within the culture of medicine and medical education.[29–32] Concurrently, we need to pay attention to the unique professionalization burden on UIM students, with the hope that eventually the culture of medicine will shift such that no extra professionalization burden is felt by minoritized students.

This study has limitations. This is a small sample from a single institution, and our qualitative results should not be generalized. We intentionally unveiled many different minoritized experiences in one analysis to capture a broad range of examples, but students from specific minoritized backgrounds may have unique experiences relating to each identity. In other words, the PIF experience of a student with a physical disability will be different from the experience of a student who grew up with insecure housing, which will be different from the experience of a Black student. Future research should examine the medical student PIF experience of different

minoritized groups depending upon their specific background.

Another limitation is that we do not compare the PIF experience of our cohort against the PIF experience of the dominant hegemonic group, so conclusions about the PIF experience of minoritized students versus other students should be drawn cautiously. Future research comparing these groups is warranted. Strengths of our study include that it is the first study to explore the PIF experience of a group of diversly minoritized medical students, and our use of rigorous qualitative methodology in both data collection and analysis.

In conclusion, the medical education community should explicitly acknowledge in both educational practices and research that every student—and every medical school—is different, and thus students' experience of PIF will not proceed lockstep. Formal institutional structures to support minoritized students are important for supporting UIM students in their unique experiences. Our qualitative findings suggest two concrete steps organizations can take to support minoritized medical students' PIF: given that participants developed their friendship groups with others who were "beaten down by the same things" such as feeling "othered" and being asked to represent their whole group, institutions could admit a critical mass of minoritized students to support the development of peer support networks. Additionally, schools could create infrastructure for formalized social and academic connection among diverse stakeholders. Individual researchers can support minoritized groups in health professions education by attending to the research team's composition, considering using critical theory as their conceptual framework, and interrogating their own possible learning opportunities with regard to issues of power and privilege.[16]

Appendix A: Semi-Structured Interview Guide

Introduction
- Can you tell me about your background? (prompt for family, childhood, personal background)
- How did you decide to go to med school?

1. How well do you feel like you fit in with the medical school culture, and with other medical students?
- Why/why not? Tell me more.
- What were your expectations about how you would fit in?
- How was it when you first arrived?
- Did you have similar feelings before you got here? When did these feelings start?

2. What does it mean to be a physician? What does it mean to be a med student? How did you arrive at this understanding?
- Are there certain ways that people think of physicians and med students? How do you think this affects the way people see you?

3. How would you describe yourself? How would others describe you?

4. What do you think are the most important parts of your identity?

5. What identities are important to you as you practice medicine?

6. How aligned is your identity (questions 3–5) with your understanding of what it means to be a physician/med student (question 2)? Describe an experience/time when the two were aligned/integrated. Describe an experience/time when the two were not aligned/integrated.
- What are your thoughts/feelings about those experiences/times?
- What do you do when things go wrong? When conflict arises between personal and professional values? Does it help?

7. Is there anything else you'd like me to ask that I didn't bring up?

> **Appendix B: Description of Adherence to the 32 items of the Consolidated Criterion for Reporting Qualitative Research (COREQ).**

Domain 1: Research Team and Reflexivity Statement

All authors on the team identify as female gender. The lead author (initials) has significant experience with qualitative and mixed methods, including being the principal investigator on numerous such research projects. The senior author (initials) has extensive experience with qualitative and mixed methods research and is the Co-Director of the Qualitative and Mixed Methods Core (QMMC) at Penn State College of Medicine. The two qualitative analysts (initials, initials) were QMMC staff members with extensive qualitative analysis experience. The remaining authors received formal training from the QMMC and engaged in collaborative discussion of qualitative methodology and theme development. Additional 'Personal Characteristics of the Research Team' is reported in the manuscript.

Dr. [lead author name] serves as the director of a required pre-clerkship course and thus came into regular and formal contact with the students during the time of the study. Students were aware of Dr. [lead author name's] involvement as the study lead. For the remaining authors, relationships with participants were minimal or absent prior to the research study. Interviewer characteristics are reported in the main manuscript.

The qualitative research team reflexivity statements are as follow.

The lead qualitative researcher (initials) is a white female who has a PhD in Health Care Ethics with an emphasis in Empirical Methodology and is an Associate Professor in the Department of Humanities. She has a scholarly interest in the experience of professionalization for medical students who self-identify as not fitting the stereotype. This group commonly includes students who meet the AAMC criteria for underrepresented in medicine (UIM), but also includes students who are LGBTQ+, religious minorities, from socially disadvantaged backgrounds, differently abled, and a wide variety of other learners. She is interested in the structural factors underlying human phenomenon, including the influences of larger hegemonic and ideological forces. Moreover, the researcher has a health humanities background and applies a humanistic perspective to her evaluation of data. The researcher took seriously the need for objectivity during design and analysis as a result of potential implicit bias. She bracketed bias to the extent possible by engaging in ongoing note-taking and reflection to surface her preconceptions both before and during the research process.

The senior author (initials) is white, female, critical care physician scientist whose research interest focuses on end of life and communication issues and has experience teaching medical humanities, ethics, and communication to medical students. As a female critical care physician, she is a gender minority in her medical field. She is the co-director and co-founder of the Qualitative and Mixed Methods Research Core. Her qualitative work generally follows a pragmatic approach using descriptive methods to understand phenomena, and she applies a humanistic perspective to data analysis. She has done extensive research around advance care planning and healthcare distrust in underserved communities nationwide. She was involved as a methodologic consultant. She took seriously the need for objectivity during design and analysis as a result of potential implicit bias in other team members with connections to the topic. This researcher bracketed bias to the extent possible by consistently checking methodologic and analytic decisions by referencing the raw dataset.

The interviewer (initials) for this study was a Black MD/PhD student who had completed the first two years of medical school and was in the midst of completing her PhD. She received formal interview training from QMMC. She had a prior acquaintance relationship with some but not all of the research participants. The interviewer has a personal history of interest in the first-generation students' experience in medical training. She has personal experience with the topic being studied: professionalization for medical students who are UIM which allowed her to impart an emotional connection to the topic and potentially influenced her interviews. Objectivity was pursued to the extent possible by using an IRB-approved interview guide developed by the research team, with input from community members.

The co-author (initials) assisted with theme development and meaning making. She is a Black Associate Professor of Political Science, doing work on the role that race and ethnicity have in shaping individual's understanding of their own identity and political attitudes. She had limited expertise regarding medical education and therefore was able to apply an unbiased, outsider's lens to theme development.

Both of the two analysts who assisted with qualitative coding (initials, initials) were white, female research assistants employed by the QMMC. Neither had background knowledge on experiences of medical students and therefore were able to apply a relatively unbiased lens to the data analysis. Objectivity regarding the data was prioritized, and both researchers took special care to analyze the data iteratively and collaboratively with each other.

Domain 2: Study Design

The theoretical frameworks and orientation for the study are described in the main manuscript. Details related to sampling, consent, setting, and study design are also provided in the main manuscript. There were no participant dropouts during the study period reported in this paper.

The interview guide is provided in Appendix A. All interviews were audio recorded. The interviewer took field notes to help guide the one-hour discussions, but these notes were not intended for incorporation into the analysis. Data saturation was judged to occur after review of 6 transcripts for top level themes. Transcripts were not returned to participants due to feasibility issues and the controversial nature of member checking.

Domain 3: Analysis and Findings

The two coders and the lead author reviewed the entire dataset. Dr. [senior author name] reviewed coding reports. The coding tree is provided in Appendix C. The constant comparison method was used during the analytic process to derive themes that emerged from the data and were not identified in advance. Coding was performed using MAXQDA 2020. Details of the analytic approach and methodology are presented in the main manuscript along with the major themes and quotations. Minor themes and outlier cases (e.g., three female participants described that their family was less supportive of the decision to enroll in medical school) are also reported.

Appendix C: Code System

Code System
Code System
1. Background Information
1A. Previous Education
1B. Family Background and Identity
1B1. Race/Nationality
1B2. Religion
1B3. SES
1B4. Other
1C. Pre-Med School Environments
2. Reasons for Medical School/Profession
2A. Following Footsteps
2B. Previous Work Experiences
2C. Educational Experience
2D. Helping the Community
2E. Unsupportive Family
2F. Supportive Family
2G. Other
3. Expectations about Medical School
3A. Expecting Lack of Diversity
3B. Expecting Diversity
3C. Expecting Competitive People
3D. Finding Like-Minded People
3E. Expectation to Find Mentors
3F. Expectations About Education
3G. Concerns About Not Fitting In
3H. Other
4. Perceptions and Experiences of Medical School
4A. Different than Other Kids
4B. Acceptance of Diversity
4C. Workload Less Intense
4D. Lots of Pressure
4E. Others' Perceptions of Med School
4F. Loss of Outside Identity
4G. Lack of Like Mentors
4H. Need Support System
4I. Education
4J. Self-Doubt
4K. Other
5. Role as a Medical Student
5A. Learn as Much as Possible
5B. Support Other Clinicians
5C. Future Direction
5D. Other

6. Clinician Stereotypes
6A. Bad Communication Skills
6B. Bad Patient Relationships
6C. Other Negative Attributes
6D. Positive Attributes
6E. Other
7. Ideal Medical Identity
7A. Personal Identity Not Hidden
7B. Humanistic Traits
7C. Advocate
7D. Other
8. My Identity
8A. Personality Traits
8B. Compartmentalizing My Identity
8C. My Specific Identity
8C1. Race/Ethnicity
8C2. Gender
8C3. Sexual Orientation
8C4. Religion
8C5. SES
8C6. Other
8D. Stereotypes & Negative Experiences
8D1. Race/Ethnicity
8D2. Gender
8D3. Sexual Orientation
8D4. Religion
8D5. SES
8D6. Other
8E. Managing Conflicts
9. Ways to Combat Stress
9A. Journaling
9B. Family & Friends
9C. Art & Music
9D. Religion
9E. Other

Title: "*It creates a divide*": Minoritized medical students' perceptions on professional identity formation

Journal: *Journal of Racial and Ethnic Health Disparities*

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References

1. Mount GR, Kahlke R, Melton J, Varpio L. A critical review of professional identity formation interventions in medical education. *Academic Medicine*. 2022 Nov 1;97(11S): S96-106. https://doi.org/10.1097/ACM.0000000000004904

2. Holden MD, Buck E, Luk J, Ambriz F, Boisaubin EV, Clark MA, et al. Professional identity formation: creating a longitudinal framework through TIME (Transformation in Medical Education). *Academic Medicine*. 2015;90(6):761-7. https://doi.org/10.1097/ACM.0000000000000719

3. Paradis E, Webster F, Kuper A. Medical education and its context in society. *Oxford University Press* UK; 2013. Settings

4. Office for Diversity and Inclusion. History of minorities in medicine: The University of Alabama at Birmingham. Retrieved 9-16-2022 from https://www.uab.edu/medicine/diversity/initiatives/minorities/history

5. Flexner A. *Medical Education in the United States and Canada*. New York, NY: The Carnegie Foundation; 1910.

6. Savitt T. Abraham Flexner and the black medical schools. *Journal of the National Medical Association*. 2006;98(9):1415.

7. Beck AH. The Flexner report and the standardization of American medical education. *Journal of the American Medical Association*. 2004;291(17):2139-40.

8. Hoque S, Baker EH, Milner A. A quantitative study of race and gender representation within London medical school leadership. *International Journal of Medical Education*. 2021;12:94. https://doi.org/10.5116/ijme.609d.4db0

9. Nobles A, Martin BA, Casimir J, Schmitt S, Broadbent G. Stalled progress: medical school dean demographics. *The Journal of the American Board of Family Medicine*. 2022;35(1):163-8. https://doi.org/10.3122/jabfm.2022.01.210171

10. Kaplan SE, Raj A, Carr PL, Terrin N, Breeze JL, Freund KM. Race/ethnicity and success in academic medicine: findings from a longitudinal multi-institutional study. *Academic Medicine*. 2018;93(4):616-622. DOI: 10.1097/ACM.0000000000001968

11. Wyatt TR, Balmer D, Rockich-Winston N, Chow CJ, Richards J, Zaidi Z. 'Whispers and shadows': a critical review of the professional identity literature with respect to minority physicians. *Medical Education*. 2021;55(2):148-58. https://doi.org/10.1111/medu.14295

12. Chow CJ, Byington CL, Olson LM, Ramirez KPG, Zeng S, López AM. A conceptual model for understanding academic physicians' performances of identity: findings from the University of Utah. *Academic Medicine*. 2018;93(10):1539-1549. https://doi.org/10.1097/ACM.0000000000002298

13. Blalock AE, Smith MC, Patterson B, Greenberg A, Smith BR, Choi C. "I might not fit that doctor image": ideal worker norms and women medical students. *Medical Education*. 2022;56(3):339-48. https://doi.org/10.1111/medu.14709

14. Wyatt TR, Rockich-Winston N, Crandall S, Wooten R, Gillette C. A comparison of professional identity experiences among minoritized medical professionals. *Journal of the National Medical Association*. 2022 Aug 1;114(4):456-64. https://doi.org/10.1016/j.jnma.2022.05.013

15. Wyatt TR, Rockich-Winston N, Taylor TR, White D. What does context have to do with anything? A study of professional identity formation in physician-trainees considered underrepresented in medicine. *Academic Medicine*. 2020;95(10):1587-93. https://doi.org/10.1097/ACM.0000000000003192

16. Wyatt TR. "The sins of our forefathers": reimagining research in health professions education. *Advances in Health Sciences Education*. 2022;27(4):1195-206.

17. Wyatt TR, Zaidi Z. Bricolage: A tool for race-related, historically situated complex research. *Medical Education*. 2022;56(2):170-5. https://doi.org/10.1111/medu.14629

18. Kincheloe JL, McLaren P. Rethinking critical theory and qualitative research. *Key Works in Critical Pedagogy*: Brill; 2011. p. 285-326.

19. Boatright DH, Samuels EA, Cramer L, Cross J, Desai M, Latimore D, et al. Association between the Liaison Committee on Medical Education's diversity standards and changes in percentage of medical student sex, race, and ethnicity. *Journal of the American Medical Association*. 2018;320(21):2267-2269 https://doi.org/10.1001/jama.2018.13705.

20. Association of American Medical Colleges. Table A-14.3: Race/Ethnicity Responses (Alone and in Combination) of Matriculants to US Medical Schools, 2016-2017 through 2020-2021 2021. Retrieved 9-16-22 from https://www.aamc.org/data-reports/students-residents/interactive-data/2020-facts-applicants-and-matriculants-data.

21. Creswell JW, Creswell JD. *Research design: Qualitative, quantitative, and mixed methods approaches*: Sage Publications; 2017.

22. Delgado R, Stefancic J. *Critical race theory: An introduction*: NYU Press; 2023.

23. Moustakas C. *Phenomenological research methods*. Thousand Oaks, CA: Sage; 1994.

24. Hsieh H-F, Shannon SE. Three approaches to qualitative content analysis. *Qualitative Health Research*. 2005;15(9):1277-1288. https://doi.org/10.1177/10497323052766

25. Software V. MAXQDA 2022 [computer software]. Berlin, Germany: VERBI Software2021. p. vailable from maxqda.com.

26. Creswell JW, Poth CN. *Qualitative inquiry and research design: Choosing among five approaches*: Sage publications; 2016.

27. Volpe R, Hopkins M, Haidet P, Wolpaw D, Adams N. Is research on professional identity formation biased? Early insights from a scoping review and metasynthesis. *Medical Education*. 2019;53:119-132. https://doi.org/10.1111/medu.13781

28. Cruess RL, Cruess SR, Boudreau JD, Snell L, Steinert Y. A schematic representation of the professional identity formation and socialization of medical students and residents: A guide for medical educators. *Academic Medicine*. 2015;90(6):718-725. https://doi.org/10.1097/ACM.0000000000000700

29. Todic J, Cook SC, Spitzer-Shohat S, Williams Jr JS, Battle BA, Jackson J, et al. Critical theory, culture change, and achieving health equity in health care settings. *Academic Medicine*. 2022;97(7):977-988. https://doi.org/10.1097/ACM.0000000000004680

30. Blagev DP, Barton N, Grissom CK, McKee KE, Harrison AM. On the journey toward health equity: data, culture change, and the first step. NEJM Catalyst Innovations in Care Delivery. 2021;2(7), 1-17.) https://doi.org/10.1056/CAT.21.0118

31. Smeltz L. Polite Persistence. *Family Medicine*. 2022;54(8):645-646. https://doi.org/10.22454/FamMed.2022.924429

32. Ellis D. Bound together: allyship in the art of medicine. *Annals of Surgery*. 2021;274(2):e187-e188. https://doi.org/10.1097/SLA.0000000000004888