Author's response to reviews

Title: Just fun or a prejudice? - Physician stereotypes in common jokes and their attribution to medical specialties by undergraduate medical students

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Author’s response to reviews:

Dear Ms Partridge,

Below please find our point-by-point reply to all reviewers’ comments and suggestions. Changes in the manuscript are marked in blue. The discussion was shortened by one page and rearranged to focus on the main findings. All figures are provided in better quality. We hope that with these revisions our manuscript might now be acceptable for publication in BMC Medical Education.

Kind regards,

Sigrid Harendza

Editor Comments:

Additional advice was sought regarding this decision given the nature of the reports and the reviewers' recommendations. Our Editor suggested: the authors should aim to clarify the research gap a bit better, and draw out the links (or lack of links) between how they answered the questions, their actual prejudices and their actual career choices. My suggestion is that this links are probably weak and this should be noted as a limitation.

Reply: We have clarified the research gap in the introduction with respect to the actual development of prejudices for some specialties during medical school and included the lack of knowing about the career choices of our study participants as a limitation.

Reviewer reports:

Mark David Schwartz (Reviewer 1):
The authors are to be congratulated for tackling this complex and pervasive issue in the professional identity development and career choice of medical students. The novel use of jokes as a lens into this socialization process is intriguing.

In addition to the more specific comments below, the paper would be strengthened by clarifying the rationale for the scientific premise (that jokes about doctors reflect culturally socialized beliefs about specialty characteristics in a way that may distort student career predictions, and therefore is a problem that medical educators should address. What is the evidence that medical students choose specialties that are inconsistent with their core values and preferences because of this cultural/socialization process? Why is this a problem that needs to be solved?

Introduction:

- Figure 1 appears only indirectly related to this paper and can be omitted. It is the subjective idea of a single resident that trained more than a decade ago.

Reply: Figure 1 was eliminated from the manuscript.

- While the notion that negative (or positive) stereotypes of medical specialties and the impact of stereotype threat might influence student career choice, the evidence cited by the authors is largely subjective and anecdotal.

Reply: This aspect has been modified in the manuscript with a connotation to the anecdotal evidence.

- What is the rationale for seeking to answer questions 2 and 3 re year in medical school and student gender? (lines 112-117)

Reply: The rationales for questions 2 and 3 were based on the hypothesis that some stereotypes might develop over time with the increasing number of years in medical schools and on the hypothesis that differences in assigning stereotypic characteristics to specialties might occur between male and female students.

Methods:

- The "personality characteristics" seem to be generalized behaviors based on artifact jokes. What method did the researchers use to extract these characteristics from the jokes?

  o Since the study is looking at the role of humor in common doctor jokes, the paper would be strengthened by including examples of common jokes and how the characteristics were extracted.

Reply: The qualitative methodology, how the personality characteristics were extracted from the jokes is described in the methods section starting from line 146 of the original manuscript under
the subtitle “Definition of specialty characteristics from the jokes”. This part has been extended. In describing this method, we would rather refrain from giving an example of a common joke because usually other groups of persons are stereotyped in such jokes. The method seems to us completely transparent and repeatable in the way it is described without giving an example of a joke. We hope this finds the reviewers agreement.

- Lines 156-157: Showing an example with the exact language in the questionnaire would help clarify the readers' interpretation of the findings.

Reply: An example in the exact language in the questionnaire is provided now in the methods section.

Results:

- There is a potential selection bias given the low response rate of students compared to the overall population. These students could potentially be more interested in doctor jokes, for example, depending on the content of the recruitment email.

Reply: The students were not aware that the characteristics were extracted from jokes. The were simply asked to assign the characteristics to the specialties. The exact invitation for the questionnaire is provided now in the methods section.

o It would help if the authors provided a comparison of student characteristics between those who responded to the survey and those that did not respond.

Reply: Unfortunately, it will not be possible to provide these data because age, gender and other data from the students who did not respond are not available.

o Lines 321-322: It is not clear what the three groups of students compared refer to in this assertion.

Reply: In former line 321-322 not groups of students but number of characteristics are referred to. It might have led to a bias that a higher number of characteristics stereotyped some specialties. If, e.g. only two characteristics were assigned congruently to a specialty with a total number of eight characteristics that would have led to a different percentage than assigning two characteristics congruently for a specialty with a total number of six characteristics. We have modified this sentence to clarify this aspect.

- Given that the study takes place at only one medical center in Germany, it is difficult to interpret the generalizability of the study. Furthermore, the professional culture within this university could potentially influence the results of the study and thus a description of the medical center/school and the pattern of career choice among their recent graduates would strengthen this paper.
Reply: We agree with the reviewer that generalizability is a problem because the study was only carried out at one medical center. A comment was already included in the limitations section that this study should be considered to have been a pilot study. We marked this in blue. We also added a comment on the curriculum at our medical school in the methods section. Unfortunately, we will not be able to provide comments on career choice of our graduates because we will not be able to provide any data on this topic. We included this in the limitations of our study.

- Another concern is the average age range of the students in the study, as students begin medical school in Germany directly after high school, and thus their maturity levels may differ from medical students in other countries, i.e. the United States.

Reply: We agree with the reviewer that the age range of undergraduate medical students might be different in other countries and we included this with respect to transferability of our data in the limitations section of the manuscript.

Discussion/ Significance:

- Working in an academic medical center, we were not surprised by the existence of stereotypes between fields. In addition, most of the stereotypes that are significantly congruent may be considered to be more common knowledge, as the study suggests, from movies, books, television, etc.

Reply: We agree with the reviewer that some of the stereotypes that are significantly congruent seem to be “common knowledge”. However, the significant increase for internists and orthopedics from first to twelfth semester could suggest that some stereotypes for these disciplines might be developed at medical school when students have more contact with teachers from these disciplines during their clinical courses. We included this aspect in the discussion and conclusion.

- The finding that surgery and psychiatry are the most readily identified from these characteristics is not novel. Such stereotypes are long-standing and medical schools have been acting to mitigate the potential impact of these for many years. It is not clear how these findings advance our understanding of the potential problem of how popular culture shapes our behavior. Nor does it suggest new strategies to addressing this issue.

Reply: While the long-standing stereotypes of surgeons and psychiatrists are well recognized by students from our medical school with no increase during studies there seems to be a development of stereotypes for other disciplines (internal medicine, orthopedic surgery) during medical school. This is a novel finding and which might be important to address when teaching professional attitudes. We illustrate this now a bit more in the discussion.

- The work could be strengthened by exploring further the impact of the stereotypes on the medical students. This could be an important area of research, to understand if stereotypes impact career choices and professional identity development.
Reply: It will not be possible to include this aspect in this manuscript as this was an explorative pilot study but we added this aspect in the prospects for further studies.

Furthermore, it would be interesting to know the specialty choices chosen by participants of the study, though this would change the study design greatly. By understanding the role of stereotype threat, perhaps strategies could be developed to mitigate that impact.

Reply: It would indeed be interesting to know the specialties chosen by participants of the study. However, as this was a cross-sectional and not a longitudinal study, students from semester 2 will not choose a specialty before the year 2019 and students from semester 12 have left our medical school two years ago and cannot be followed further. Therefore, further studies are needed to investigate whether a stereotype threat exists, especially for specialties like internal medicine and orthopedic surgery where the recognition of stereotypes increases during medical school. We added this aspect in the discussion and conclusion.

Finally, the role that stereotypes play into the culture and hospital environment between different specialties would be interesting to explore.

Reply: Thank you for this comment. This is an interesting question. Currently we are planning to use the questionnaire with residents from the respective disciplines.

Ludmila Marcinowicz (Reviewer 2): Review of the manuscript MEED-D-16-00818 entitled Just fun or a prejudice? - Physician stereotypes in common jokes and their attribution to medical specialties by undergraduate medical students

General comments

The article is interesting and provides relevant information for the wider international community. However, there are areas where the manuscript could be improved.

Reply: Thank you very much. Your positive feedback is greatly appreciated.

Detailed comments

1. Introduction: The background and literature review provided context for the research. I think the paper would be richer if you considered some more theoretical approaches to jokes and humor.

Reply: We included some more theoretical approaches to jokes and humor with respect to medicine in the introduction.

2. Methods: In the description of methodology, the Authors do not cite any literature providing the basis for their research. There is no mention of the methodological framework underpinning the study.
Reply: Our study consists of a qualitative part – the definition of the stereotypes from the jokes – and a quantitative part – the questionnaire for the students. Hence, an underpinning framework does not exist. However, we describe the qualitative part in further detail now (please also refer to comments of reviewer 1).

3. References. References are extensive and very well selected regarding the subject of the paper, but works concerning research methodology are missing.

Reply: There are no specific references for the research methodology other than the combination of qualitative with quantitative methods. However, we included more literature on theoretical approaches to jokes and humor (please see comment number 1).

Kelly Mulvey (Reviewer 3): Review of MEED-D-16-00818 This research study examines medical students' assignment of different traits to different medical specialties. While it is generally clearly written, I am not sure exactly what the current study adds to our understanding of stereotype endorsement by medical students. The findings are largely descriptive in nature and without measures that also assess the medical students' intended specialty, the findings seem rather underwhelming. Additionally, while the sample size is large, the response rate is quite low, introducing the possibility that the results will not generalize well.

Reply: The pilot study is a mix of qualitative – the definition of the stereotypes from the jokes – and a quantitative research – the questionnaire for the students. According to the results, it seems to add to the existing literature that some stereotypes (surgery, psychiatry) seem to be based on “common knowledge” while others (internists, orthopedics) seem to develop during medical school. If the latter was confirmed in a larger study, it might have some impact towards the teaching of attitudes at medical school. We agree with the reviewer, that the response rate might raise some doubts about potentially biased results. Unfortunately, surveys with medics generally tend to have lower response rates than surveys with other populations and a decline in participation in social sciences surveys has been observed in recent years in general. We emphasize this stronger in the limitations section now and included the respective literature.

I am a bit perplexed by the research questions. It appears that you are asking students to stereotype the different specialties by assigning these often negative characteristics to the specialties. So, is your first research question assessing whether students hold the same stereotypes as portrayed in the jokes? You describe the survey as asking if they felt the statement could be assigned to one of the specialties. It seems as though this question could tap just their awareness of the stereotype (as in people say or people think that X), but not necessarily their endorsement of that stereotype (general surgeons are X). This is an important distinction. Both awareness and endorsement may related to later career choices, but they may also work very differently. It would be helpful to get further clarification on what exactly was asked and what type of response you believe you obtained.

Reply: The students were not told that the characteristics originated from jokes. The questions were asked in an endorsing fashion: X are …. (the dots were replaced with the respective
statement). The methodology is explained now in more detail in the methods section (please refer also to reviewer 1).

Is there evidence for interrater reliability or any external checks on validity of the personality characteristics that were derived?

Reply: The data from our pilot study are merely descriptive. We are in the process of planning a large study involving physicians from the respective disciplines to answer the questionnaire followed by focus groups discussing their responses. Unfortunately, we will not be able to include these data in this manuscript.

Why was the choice made to only allow participants to tick one box per statement?

Reply: The choice to allow only one statement was made because the respective characteristic was not assigned to different specialties in the jokes, just to one specialty. Furthermore, as mentioned in the methods section, the option “none” was also possible if students felt that the trait did not characterize any of the specialties. We do not know, how many students started the questionnaire and did not finish is. Our system allowed us only to assess completed questionnaires. The number of completed questionnaires was 308 as mentioned.

Can you provide more information about the demographics of your participants (gender, age, ethnicity, SES)? Some of this is buried in the results section, but it should be moved up to the participants section.

Reply: The information about the demographics of the participants has been moved to the methods section as requested. Only gender and semester were requested.

Can you clarify what you mean by the "congruent assignment of a characteristic to the specialist it was extract from originally"?

Reply: We mean that the characteristic was assigned “correctly” (e.g. if a characteristic was extracted from a joke on surgeons and this characteristic was assigned to surgeons by a student we called this “congruent assignment” – we did not want to call it “correct assignment” because we felt that it would be inappropriate to call a stereotype “correct”).

The quality of some of the figures is quite poor and I cannot read the text to know what the bars represent, so it is very hard to evaluate these findings.

Reply: The quality of all figures has been improved.

The discussion of the results should frame the importance of the findings of the current project more prominently from the start. Currently, it quickly jumps to more of a review of prior findings, without contextualizing why the current results are important or how they contribute to this prior literature. I also, at times, felt as though the discussion strayed from the direct findings
a bit. For instance, the increase over the years in congruence of stereotypes about orthopedics is framed as suggesting an in-group bias, however you don't have report any data that suggests that these students actually had begun to think of orthopedics or general surgeons as their ingroup. Overall, the discussion does not draw together the findings and provide insight into how these might inform policy, or practice.

Reply: The discussion has been rearranged in major parts and shortened by one full page to provide a stronger focus on the prominent findings and to clarify some aspects.