






**RESEARCH**

# Myths and social structure: The unbearable necessity of mythology in medical education

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## Abstract

**Context:** Myth busting engages scholars in the critical examination of commonly accepted but poorly evidenced claims with the goal of instilling quality and trust in knowledge making. The debunking of such knowledge “myths” and associated misguided practices purportedly serves to avert resources and attention from wasteful and dangerous scholarship. We address the myth that “all myths in medical education deserve to be busted”.

**Methods:** Using a critical narrative approach, we searched the medical education literature for orientations to myths and myth busting, and reviewed this literature analytically drawing from the sociology of science and Merton's concepts of manifest and latent functions. The results of this analysis are presented in the form of a narrative that deploys the articles reviewed to explore the utility of myth busting for medical education reform and begins with a brief exploration of the etymology of “myth” and how meaning making is related to symbols, practices and storytelling.

**Results:** Our analysis revealed the important function of myths in the social practice of medical education and practice. A deconstruction of five salient examples of the contemporary myth in medical education (the myth of the “ideal candidate”, the myth of “cut-throats”, the myth of “cadaver stories”, the myth of “learning styles”, and the myth of “patient information leaflets”) demonstrates that myths continue to have material effects even after they have been busted.

**Conclusions:** Our analysis makes evident that myth busting disrupts, renegotiates and reconstitutes socio-epistemic relationships rather than simply correcting falsehoods. We also argue that myths play important and inescapable roles in the social practice of medical education and the negotiation of values, and in constructing the conditions for group change and transformation. Imperatives related to *humanism*, *compassion* and *patient engagement* offer a healthy humanising counter-mythologising that we suggest must survive any contemporary myth-busting endeavour aimed at improving medical education practice.

## 1 | INTRODUCTION

Myth busting as represented in this themed issue entails the critical examination of commonly accepted but poorly evidenced claims with the goal of instilling quality and trust in knowledge making. In medical education, scientifically based understanding of how people learn, including how they develop certain behaviours and attitudes towards their learning, provides necessary information for the organisation of medical training. When operating in the ethos of science, medical educators are reluctant to base their educational work on scientific myths (or falsehoods). The debunking of such knowledge “myths” and associated misguided practices serves to avert resources and attention from wasteful and dangerous scholarship. This debunking also plays an important role in the development and growth of medical education as a field. In the process, as we will argue, debunking also conceals important roles played by scientific myths in the social realm of medical education that inadvertently undermine efforts to transform medical education. Put simply, although myths interfere with the progress of science, they still have social and political functions. When we study these alternative functions of myths we can better appreciate how contemporary socio-cultural and political arrangements interfere with our capacity to transform medical education.

Knowledge fields achieve social organisation through the establishment of a shared value system in relation to what counts as knowledge. In this sense, “[e]very ethos implies a mythos. That is, every ethical system depends upon some fundamental story disclosing its assumptions about human nature, freedom, good and evil, and the workings of the universe”.<sup>1</sup>

Medicine and, by extension, medical education operate “under the rules of a myth,” which claims that “our order and our security stem from interest in and scientific investigation of ourselves as matters of great importance”.<sup>2</sup>

This is the normative dimension of science. Because mythologies create systems of thinking and social organisation (whether they are premised on purported scientific thinking or other accepted value systems), they are conduits for social interaction and organisation. As such, myths are “endlessly unfolding” and “open to amazing interpretation and reincarnation”.<sup>3</sup> For social scientists working in medical education, ideas and practices that are premised on the normative underpinnings of “science” or other “mythologies” are entry points to a number of important topics, including how the field comes to appreciate what counts as knowledge, and how and where to invest time and energy for education reform.

For these reasons, we employed a critical narrative approach.<sup>4</sup> Consistent with this approach, we searched the medical education literature for orientations to myths and myth busting, and reviewed this literature analytically drawing from the sociology of science and Merton's concepts of manifest and latent functions.<sup>5</sup> We present the results of this analysis in the form of a narrative that incorporates the articles reviewed to explore the utility of myth busting for medical education reform. Our approach differs

from a systematic review in that we did not conduct an exhaustive analysis of what is known about myths and myth busting. Instead, we explored the unintended consequences of assuming that “all myths in medical education automatically deserve to be busted”, and supported this position with representative examples from the literature.

We begin by briefly exploring the etymology of “myth” and the social cohesion and organisation function of myth construction. We propose that myth busting disrupts, renegotiates and reconstitutes socio-epistemic relationships rather than simply correcting falsehoods. Merton's classic demonstration of how meaning making relates to symbols, practices and storytelling illustrates that myths in medical education can play important roles in the practice of medical education by renegotiating values and constructing the conditions for change.<sup>5,6</sup> We argue that some myths nested within medical education lend insight into the field's sociopolitical and cultural dimensions. We offer five examples of myths in medical education that have survived myth busting and can be studied to reveal how spaces, values and priorities in medicine can be negotiated and challenged in the daily practice of educating health professionals. We conclude by overviewing imperatives related to *humanism*, *compassion* and *patient engagement* that offer a kind of healthy humanising counter-mythologising that we suggest must survive any contemporary myth-busting endeavour aimed at improving medical education practice.

## 2 | THE ETYMOLOGY OF “MYTH” AND THE SOCIAL FUNCTION OF MYTH-MAKING

The term “myth” stems directly from the Greek word *mythos* and from the modern Latin *mythus*. It connotes a traditional story, legend, piece of folklore or tale that provides an explanation, aetiology or justification for social or natural phenomena.<sup>7</sup> It also connotes an untrue or erroneous belief, a widely held misconception, a misrepresentation of the truth, or something fictitious.<sup>7</sup> The second meaning is closely associated with the first. By the 19th century, the rise of science was thought to spell “the death of myths”.<sup>8</sup> In turn, and within the work of science, the stories we now call myths began to take on the attributes of naïve or erroneous accounts and thus were perceived to have “no relevance where facts [we] re concerned”.<sup>9</sup> Indeed, to this day, the epistemic value of myths as a source of evidence is highly contested in natural science fields. Treated as false stories or explanations, myths are seen as holding little value for natural scientists looking for objective, verifiable truths about how the world functions. As scientists, physicians are trained to “view disease in a similar way to other natural phenomena”<sup>10</sup> and as a result are oriented towards evidence in hierarchical terms in which “that which is most universal in its application or most general in its import, is the most significant”.<sup>2</sup> The labelling of various medical theories, claims, practices<sup>11-14</sup> or healing traditions<sup>15,16</sup> as “myths” functions as a marker of senescence and progress in medical education.<sup>17-21</sup> In the Kuhnian sense,<sup>22</sup> myth

busting is a natural operation of knowledge-generating fields, whereby new scientific discoveries produce enough disjuncture in the current way of thinking to necessitate a paradigm shift to maintain the function of the field and to rid it of erroneous former explanations. This is the origin story of modern medicine and by extension of medical education.

Many cultures, including those of medicine and medical education, construct origin stories. How these origin stories function in specific cultures varies. It is not enough to consider the content of a myth. The meaning of a myth also includes its social function: when it is taken up, by whom and for what purpose. People co-create while simultaneously and iteratively interpreting the meaning of myths.<sup>23</sup> Mythologising allows us to organise our engagement with the world and to negotiate ways of becoming. In short, myths do not exist in a vacuum; they often reflect certain aspects of the larger sociocultural and political landscape.

The Cartesian split, a theory which holds that human reasoning and cognition function separately from the bodies of themselves and others, makes possible the notion that “disease can be considered as *separate* from the person with it”.<sup>23</sup> Reinforced by this Cartesian/biomedical mythology, immersion in the meaning making of patients and the interpretation of their health experiences, something more aligned with the epistemologies of feminists, phenomenologists and indigenous peoples worldwide, is still regarded as “other” in the culture of medicine. Medical education has reinforced this narrative by its participation in the training of health professionals in the biomedical model at the expense of other ways of making sense of health and illness.

By contrast, the social sciences and humanities (anthropology, psychology, philosophy, religious studies, political science and sociology)<sup>24-27</sup> view myths as creating a portal to the understanding of social development regardless of whether the narrative is scientifically valid or not.\* Circulating myths, especially myths that persist even after they have been “debunked”, may continue to serve social functions.<sup>24,26</sup> Myths enjoy shared belief and, in the process, contribute to social stability, identity formation and community around specific practices.<sup>25,26</sup> As Durkheim writes, “... all myths, even those which we find the most unreasonable, have been believed. Men have believed in them no less firmly than in their own sensations; they have based their conduct upon them.”<sup>28</sup>

The term “myth” then entails much more than a container for falsehood. It encompasses “ideas and beliefs that we inherit as part of our shared intellectual culture”.<sup>29</sup> For medicine and medical education, the origin story of their own fields represent one such myth: that the only knowledge that matters is scientifically derived appreciation of the human body and its operations, including cognition. Those working in medical education today, even if they aspire to include an orientation towards social science and the humanities in their work, must struggle against the expectations of scientism. To create space for different forms of knowledge making is to call

attention to the assumption that science itself can and ought to be myth-free.<sup>29</sup>

Myths, in the sense we are implying, are mechanisms for transmitting meaning, culture and ideology that extend even to the enterprises of science and medicine themselves. They are social practices that shape group identity and operate “in the service of power”.<sup>26</sup> It is in this last sense that we argue for preserving space for the study of myths in medical education, particularly myths that survive myth busting. Exploring the sociopolitical dimensions of mythologies allows scholars to raise questions about the identity of a cultural practice (medicine) and the structure, processes and content of the acculturating to that practice (medical education). We propose that such study leads to a reflexive education practice that can bring needed nuance to education reform.

Brown notes that “myth-making—the practice of producing stories—is dialectically related to social formation—the practice of organising in groups based on modes of production”.<sup>30</sup>

This includes science as a mode of production: although it is “commonly accepted that medicine combines both ‘science’ and ‘art’... the assumptions underlying the science of medicine are rarely explicated or debated”.<sup>10</sup>

Instead, medicine's own origin story has set up the field to function in a bifurcated way. Health and disease are approached and related to as “natural phenomena” that can be studied objectively, whereas care is thought to be a communication or process conundrum. Identifying with this science myth too closely, along with fulfilling its narrative, implies that we would not expect “the interaction between doctor and patient” to have “influence on the outcome of the disease”.<sup>10</sup> Furthermore, there are myths in medical education that are not subject to myth busting because they are so strongly woven into the fabric of the field.

The origin story of medical education as a field is premised on the assumption that “medicine is a science, and as such should be based in a properly *scientific* understanding of the world”.<sup>29</sup> Medicine, notwithstanding its dominant mythology of knowledge, continues to hold beliefs that have no “scientific” basis. For instance, the belief that “medicine is a culture of no culture” and the distinction between “the objectivity of science” and the “subjectivity of culture”, particularly as it plays out in the illness experience, further highlight the place for myth in medical education.<sup>31,32</sup> In problematising this longstanding belief system in medicine and medical education, we do not want to merely “bust” the notion that we can ever maintain a neutral, objective scientific orientation and practice in the study and application of medicine. On the contrary, we propose that in addition to the benefits we enjoy from medicine's commitment to scientific exploration, we can also learn from studying how and why such a commitment to an uncontested truth comes to exist in the first place, and the types of roles and identities it has made possible and impossible in health care. In short, what purpose do myths that perpetuate medicine's scientific and objective reality serve and what might we lose in the process of debunking them? What might we gain if, instead of operating within a binary of objectivity and subjectivity, we were to transcend this dualism and reinvent the field's origin story?

\*There are multiple theories for and approaches to the study of myths. Johan Degenaar gives a helpful typology.<sup>26</sup>

### 3 | TOWARDS A SOCIOLOGY OF MYTH-MAKING IN MEDICAL EDUCATION

Until this point, we have argued that the function a myth comes to play may be other than that appreciated or recognised as valid by members of that community, a point that reminds us of Merton's concepts of manifest and latent functions.<sup>5</sup> Manifest functions represent stated and recognised objective consequences, namely, dimensions of social operations that have an intended purpose in the organisation and stability of a social system.<sup>5,6</sup> Conversely, latent functions are observable effects that are neither explicitly intended nor recognised by participants in the system. Latent functions, although unintended, may also serve in the stability of a system. Merton argued that distinguishing between manifest and latent functions heuristically allows sociologists to clarify "seemingly irrational social patterns [*italics in original*]. ... which persist even though their manifest purpose is clearly not achieved".<sup>5</sup> Merton offered the example of Native American rain dance rituals. He noted that although we can scientifically explore the manifest function of the rain dance ceremony and conclude that it is falsely premised, an investigation of the latent functions of such rituals might uncover the roles played by these rituals, beyond their "avowed purpose", in the preservation of Native American epistemologies, culture, identities and meaning making.<sup>5</sup>

In other words, appreciating that myths may have both manifest and latent functions offers a theoretical starting point for thinking about myth-making as a sociocultural and political process. It also allows the field of medical education to tune into the politics of myth-making and to distinguish myth busting, the exercise of expunging pseudoscience, from the deconstructing of myths as mechanisms of social formation. As Latour and Woolgar have shown us, in considerable detail, scientific work is a social activity replete with the normative structures for relating to facts as facts.<sup>33</sup> When we challenge only the validity of particular facts without appreciating the social structures, identities and economies that accompany these facts, we run the risk of propagating "partial truths" and undermining our efforts to transform medical education and practice. Making a distinction between manifest and latent functions challenges the researcher to ask why, in the face of evidence (the proposed truth narrative), so-called myths continue to exist. In the following subsections we offer some examples of how this approach can help us appreciate the complexity of medical practice and medical education.

#### 3.1 | The myth of the "ideal candidate"

In medical education, the rigorous and demanding admissions process (and various requirements associated with medical school admissions) is intended to select the best possible candidates for medicine and thus operates as a manifest gatekeeping activity. A variety of evidence and myths that surround the admissions process variably influence matriculate choices and admission processes. For example, there is little evidence to suggest that we can select for an "ideal candidate" based on previous disciplinary preparation.

For this reason, many medical schools have eliminated course prerequisites. However, a latent function of the admissions process is the normalisation of "some forms of preparation" as being more relevant than others, often propagated on circulating stories related to what schools are looking for in an "ideal candidate". These distinctions of "relevant and irrelevant" educational preparation influence learner decisions as early as during high school and continue throughout medical training. The notion that medical schools are looking for students who are exceptional in biology and other life sciences results in maladaptive behaviours, including the jettisoning and sometimes outright devaluing of social science and humanities knowledge (or any kind of "alternative" knowledge) by students who are not willing to risk their career success.<sup>34</sup> Why does the myth of an "ideal candidate, who is biomedically prepared" perpetuate even in the face of evidence to the contrary that is clearly spelled out on many medical school admission pages?<sup>35-37</sup> Myths of an "ideal candidate" persist because these stories are part of medical education's hidden curriculum<sup>38</sup> and are received by students through the transmission of knowledge, attitudes, behaviours and practices that function outside the articulated formal components of the medical school admissions process. Simply telling students that such stories are untrue has not dispelled the myths. The latent function these myths serve to perpetuate is a biomedical approach in health care even in the face of organised medical education's disclaimers. The admissions process contributes to the reproduction and reinforcement of the social capital to be derived from the representation of the medical profession as an elite profession distinguished by the mastery of a sophisticated body of knowledge and skills. Indeed, most faculty and staff currently involved in admissions processes are trained to think that individuals without a basic science background will not be "good doctors". Changing admissions processes also threatens established identities and education-associated economies that make a lot of money out of preparing students to be "ideal candidates". Exploring latent functions of myths associated with medical school admissions is a starting point for engaging in a reflexive practice that can bring an important nuance to education reform, including a better appreciation of how to support humanistic and compassionate orientations in learners who aspire to enter the healing professions.<sup>39</sup>

#### 3.2 | The myth of "cut-throats"

Peter Conrad set out to study pre-medical school student culture and specifically explored the common belief in "cut-throats" amongst pre-medical students at Brandeis University; "cut-throats" are students who are "excessively competitive, selfish, grade hungry who cheat, steal books and lab reports and sabotage lab experiments".<sup>40</sup> His study effectively debunked this belief. Indeed, Conrad found more evidence of cooperative than cut-throat behaviour amongst students.<sup>40</sup> Interestingly, in the process, Conrad also discovered that this particular myth served a specific latent function. It provided a cultural explanation for failure to make it into medical school, a type of face-saving for students. The myth represented the "collective

anxiety” of pre-medical students experiencing a highly competitive and psychologically draining educational process.<sup>40</sup> However, in debunking the myth, Conrad also concluded that the pre-medical school syndrome and related stereotype of the cut-throat were *unlikely to change* because the underlying structural factors generating both student symptomatology and the consequential myth remained fundamentally untouched. He thus exposed insights into the complexity of myth busting, which suggest that reform needs to focus not only on curbing learner behaviours but on transforming the way we organise and deliver medical training.

### 3.3 | The myth of “cadaver stories”

Frederic Hafferty<sup>41</sup> exposed the socialising function of cadaver stories, or mythologies about grossly inappropriate behaviours of students in anatomy laboratories. Over the course of 14 years, nearly 200 cadaver stories were collected and analysed. A typology of narratives of the physical and symbolic manipulation of whole cadavers or certain parts—extremities or sexual organs—in various scenarios for the express purpose of challenging inhibitions and rooting out weaknesses emerged.<sup>41</sup> Hafferty, like Conrad, exposed important socialising mechanisms linked to these stories, including maladaptive practices for dealing with the anxiety and fear of first-year medical students, carried forward from pre-medical school years. He noted that “the literal accuracy of [the] ‘trueness’ of these stories lies not in the events depicted but in the symbolic transformation of the actual fears and concerns held by students as they approach and thus begin to experience lab”.<sup>41</sup>

Hafferty concluded that both myths and unwelcome behaviours will persist as long as we ineffectively deal with the anxiety and psychological dilemmas faced by students during this liminal phase in their transition from lay person to health professional.<sup>41</sup>

### 3.4 | The myth of “learning styles”

The theory of learning styles is premised on the notion that there are different optimal ways to learn and that if a student understands his or her own learning style (ie auditory, visual, tactile or convergent), that student can improve his or her learning effectiveness in formal and informal settings.<sup>20</sup> Claims have been made that learning styles improve concentration, memory and motivation and lead to more satisfying educational experiences for learners. Learning style theory also promotes the notion that the curriculum and its delivery should align with the individual style of the learner. The manifest purpose behind the application of this theory in the classroom is to improve student learning. This social practice, however, that is, the use of learning styles as an instructional approach, has been challenged scientifically for over 30 years.<sup>18,42-44</sup> Indeed, a number of harmful effects are associated with the use of a learning styles-based approach to instructional design. Students can be slotted into a category and thus dissuaded from approaching learning that does not appear to match their “diagnosed” learning style. Teachers may waste resources on ineffective techniques and generate unrealistic

expectations about learning in the classroom.<sup>19,20</sup> Why then does the myth persist? When we focus only on debunking the myth, we are unable to move beyond registering the fact that there is no scientific premise to this theory. Approaching the perpetuation of the myth sociologically, as we have discussed thus far, allows us to consider what else may be supporting the perpetuation of the myth. For example, one possible latent function of this social practice is that it constructs the conditions for economic gain. It is not coincidental that an entire industry has been organised around the notion of learning styles and includes the production of educational software, books and tapes, and consultant services.<sup>42</sup> Simply debunking the myth will not eliminate the influences of these products on educators and learners. In medical education, the stakes are high, which puts learners and instructors in the vulnerable position of believing in a myth that for all intents and purposes fulfils the notion of learner-centred instruction. Learning styles are an easy solution for solving educational problems, particularly when the intervention draws on purportedly validated tools.<sup>42</sup> Pedagogies premised on learning styles offer a surface fix to curriculum issues that capitalises on the positive classroom psychology afforded by aligning instruction with learner preferences. In medical education, the use of learner satisfaction as a proxy for learning or teaching effectiveness has a long tradition.<sup>45,46</sup> For example, instructors are evaluated based on learners’ perceptions of their learning, including learner satisfaction. Teachers who are not perceived by learners as addressing their individual needs as learners are judged harshly. Teacher evaluations are then used in the promotion (or not) of teachers. This sociopolitical dependency encourages a number of manifest and latent classroom behaviours, not all of which are scientifically proven to lead to better learning, although they may lead to greater satisfaction of teachers and learners. Further, debunking a learning style-based approach to education design does not address the issue of learning preferences and the ensuing learner attitudes towards curriculum. Although learning styles are a myth, this theory will continue to have material effects way beyond its debunking because it is intimately linked to instructor and learner attributes we value. For those students and teachers for whom the notion of learning preferences makes intuitive sense, decisions about how to prioritise learning will be hard to change simply by debunking the scientific premise of the theory. Further, imperatives to ensure that health professionals engage in self-directed and lifelong learning rely to a large extent on the learner being motivated to engage with ongoing formal learning. This reliance fuels an economy based on products that are purportedly designed to engage individuals in learning all the time. In other words, education reform, like all social processes, will only ever be partially served by simply debunking a myth.

### 3.5 | The myth of “patient information leaflets”

In the past decade, Armstrong et al<sup>47</sup> deliberately explored the manifest and latent functions of the informed consent documents used to aid patient recruitment for cancer trials. They examined why the use



of patient information leaflets (PILs) persists despite growing evidence of their ineffectiveness in improving patient decision making. By attuning to the PIL's unintended functions, Armstrong et al documented how the health care organisation interfered with its espoused mandate to improve patient decision making by infusing the process with assumptions of how "patients *should participate*" rather than providing patients with information and allowing them to decide whether or not they wanted to participate in cancer trials.<sup>47</sup> They concluded that instead of focusing on improving the readability of the PIL, a strategy that often fails because it targets patient behaviours, the health care organisation might invest its energy more productively in restructuring practices related to how research ethics are regulated and practised, exposing in the process the politics of knowledge making that constitute the underbelly of patient education.<sup>47</sup> Thus, appreciating the manifest and latent functions of myths allows us to develop a more nuanced picture of issues when developing interventions for reform that target the most vulnerable of the actors in health care.

## 4 | CONCLUSIONS

The preoccupation with myth busting is a manifestation of the epistemology of scientism as applied to medical education.<sup>29</sup> We have introduced an alternative approach to the myth, one that allows us to explore the sociopolitical and cultural dimensions of education practice. This approach to myth appreciates that teachers, learners, health care providers and patients derive shared meaning through symbolic representations of knowing perpetuated through the wide adoption of scientific or cultural myths.<sup>48</sup> Myths are a form of storytelling and meaning making that allows us to transmit "whole pictures of the world and our place within it, as well as the complex normative structures that make reasoning possible".<sup>29</sup>

We have argued that the myths that perpetuate in medical education and medicine form an integral part of our intellectual history that may not be easily and perhaps ought not to be entirely expunged. If we uncritically adopt myth busting as an essential and unquestioning mechanism for medical education science's march towards truth, we risk absolving health care education and practice from the human struggle, values, imagination and critical self-reflection that will be necessary to the renegotiation of the position of the profession in the coming decades. To do so would be to become a modern Prometheus. Science (and medicine) as a social practice is always accompanied by mythologising. To insist otherwise is to perpetuate its own half-truth. In our quest to be scientifically true, we must ask important value-laden questions that concern what we are trying to be true to and how we want to put these truths to work in the delivery of care. Our field's current preoccupation with rebalancing technocratic pursuits for cures with a stronger concentration and integration of humanistic models of care<sup>49-57</sup> requires the concerted renegotiation of values and an appreciation of the inevitable subjectivity of illness experiences. Perhaps engaging in some open mythologising is a fundamental first step in renegotiating the field's origin story. At the very heart

of this proposal is an appreciation that myth is not antithetical to science and that science "reveals to us something of the nature of [the] reality"<sup>29</sup> that we call medicine, but it can never be the full story of the human health experience. That story is still being written with every step in the social process that underlies medicine and medical education as scientific practices.

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## CONFLICT OF INTEREST

None.

## AUTHOR CONTRIBUTION

All authors (MAM, JT, BM and FWH) made substantial contributions to the conception and design of the work, and the analysis. MAM and FWH contributed to the drafting of the work, and JT and BM revised it critically for important intellectual content. All authors (MAM, JT, BM and FWH) approved the final manuscript for publication and have agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

## ETHICAL APPROVAL

Not applicable.

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