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Bridging Artificial Intelligence's Empathy Gap in the Healthcare Industry

I. Introduction: The Problem

Empathy is perhaps the most "human" characteristic we may possess. The ability for someone to feel another person's pain as their own or to have someone understand their point of view helps people feel like maybe they are not so alone, facilitating communication and fostering stronger bonds. It is also possibly the biggest obstacle of seamlessly integrating artificial intelligence into society. In particular, the healthcare industry is undergoing an unprecedented crisis. 54% of healthcare workers report symptoms of burnout, due in part to the massive work they must put in to compensate for another problem: the growing scarcity of providers (Heath). The World Health Organization reports that the global needs-based shortage of healthcare workers has risen to a startling 17.4 million due to an aging population, aging healthcare workforce, and increase in chronic diseases. On a global scale, there were 6.6 million deaths of children under age five in 2012. Most of these deaths were caused by preventable or treatable diseases; the children merely lacked access to proper healthcare. Furthermore, specifically in the United States, there is an increasingly older population that is also estimated to live longer than previous generations. The number of Americans over 65 is roughly 46 million today but by 2060, this group is projected to reach over 98 million and go from making up 15% to 24% of the US population (Gabriel). Older patients need two to three times as many clinical services as the younger generations so the need for more workers in healthcare will only be more pressing in the

next years (Meskó). Additionally, as the baby boomer generation in the United States is aging, so are physicians. Over one-third of current U.S. practicing physicians are over the age of 55 which means over a third of practitioners must be replaced for us to even sustain this amount. And people in rural areas suffer even more from this shortage issue. 20% of the United States population lives in rural areas, yet less than 10% of physicians practice in these communities ("Healthcare Disparities & Barriers to Healthcare"). People choose to work in busier areas instead because those employed in rural areas are subject to lower wages, a lack of opportunity for professional development, and poor working conditions. So if there are more people who need help and not enough people to help (or even want to help in the case of rural areas), what is the solution? Having artificial intelligence replace practitioners seems to be one sensible solution in reducing the deficit, but one must consider the matter of empathy. Many people value the face-to-face connection they can share with a doctor or a nurse as it may ease their anxiety or provide comfort. Doctors are able to detect the emotions a patient may be feeling even without any exchange of words. Could artificial intelligence truly mimic this? Furthermore, even if they could, would they necessarily be better healthcare professionals or would the lack of genuine emotions still be too large of a rift between patient and practitioner? The goal of this article is to address these questions and attempt to dispel possible detrimental disadvantages in order to advise that replacing healthcare professionals with AI would be a wise decision with minimal drawbacks for the betterment of patients.

II. The Benefits of Empathy in Healthcare

First, it is important to delineate the actual effectiveness of empathy in the healthcare field rather than the perceived value. Though many practitioners stress the importance of empathy for interpersonal purposes, there are actually proven health benefits backed up by

quantitative data. A 2012 study conducted in Italy shows that diabetic patients treated by doctors who they perceived to have a high level of empathy actually had better outcomes and lower rates of metabolic complications (Canale). And because of universal healthcare coverage in Italy, there are no confounding variables of difference in insurance, lack of insurance, or financial barriers to healthcare access to consider. This study was also an expansion on a previous one that found that a higher rate of empathy was directly associated with a better control of a patient's hemoglobin A1c and cholesterol level. Therefore, the benefits seem clear. When people feel like they are being treated by someone who cares about their well-being or someone who is able to pick up on even unspoken feelings, it leads to a better, positive relationship in which the patient feels empowered to speak openly and honestly about their symptoms. Similarly, a study done by medical researchers found that having an empathetic practitioner lowers a patient's anxiety and distress, which in turn will deliver a better clinical outcome (Derksen et al). Thus, being an empathetic healthcare professional leads to improvements in the relationship between patient and physician which leads to actual physical health benefits.

III. Types of Empathy

However, there is actually a limit to how much empathy a person can have before it begins to hinder quality of patient care. In order to properly assess this, it is important to specify two different types of empathy: *cognitive* and *affective*.

Cognitive empathy is accurately understanding what a person feels and thinks. People who are cognitively empathetic are emotionally intelligent in the sense that they are able to view things from another person's perspective but can separate themselves enough that they do not feel this person's pain as their own. It is recognition but not internalization of someone else's feelings. This is the kind of empathy that people in healthcare should be striving for. Good

practitioners will be able to take the perspective of their patient and let it guide their understanding without letting the emotional burden of the patient's pain cloud their judgment. This is useful because a doctor who is cognitively empathetic does their best to help their patient and is able to talk through any negative emotions a patient may feel even if the patient does not explicitly verbalize them. However, because there is a level of detachment, the doctor does not feel overwhelmingly emotional or responsible for every suboptimal clinical outcome.

Affective empathy refers to the emotions people feel in response to another person's pain and the urge they may feel to relieve this suffering. This can be beneficial because it often leads to prosocial behavior, but in a healthcare context, affective empathy is what sometimes causes the burnout many physicians have that was mentioned briefly earlier. "Compassion fatigue" is the emotional tiredness caused by difficult patient encounters that require great attention and empathetic listening. Too high a level of compassion fatigue leads to a greater likelihood of physical and mental exhaustion and burnout. Compassion fatigue is also the primary reason why 28.8% of resident physicians report having depression or depressive symptoms (Mata). When a doctor is affectively empathetic, they feel a patient's pain as their own. When they are able to help a patient, they feel immense positivity as they felt connected to the patient and their mood. However, in cases where they cannot help or where something went wrong, the doctor undergoes feelings of guilt and remorse because they feel responsible. But, as professors at Paris Descartes University note, this concept of compassion fatigue exclusively relies on the affective qualities of empathy, since cognitive empathy allows a doctor to separate a patient's mental state from their own and would not lead to these effects (Zenasi). Therefore, having high affective empathy is what causes these feelings of guilt and exhaustion whereas cognitive empathy is actually desirable, if not necessary, when treating patients.

IV. AI Today

So if this is the case and if cognitive empathy is what is truly valuable in the healthcare industry, then research shows that AI has actually already achieved one critical part of cognitive empathy. One algorithm created by scientists at Ohio State University has proven to be more successful than humans are at detecting emotions when given a single image. Rather than reading facial expressions like humans do, this software actually analyzes the coloring of faces in order to detect emotion ("At First Blush…"). When prompted with an image, a human was able to correctly identify a subject as being happy 70% of the time in comparison to the AI's 90%. Therefore, this program is more time-efficient than a human because it only needs one image to accurately detect a person's emotions whereas people need more time and information. But what does this mean for humans? If empathy is such a human trait but machines are able to detect human emotions with even less indicators than humans themselves, does this eliminate one of the last fields that we previously thought made us us? Not necessarily. Recognizing emotion is entirely different from understanding it. Though detecting a patient's feelings is certainly useful in the healthcare industry, there are other important benefits and drawbacks related to empathy to assess besides emotion identification.

One surprising consequence of a lack of empathy is that people actually tend to be more honest when disclosing information to a faceless machine. In a study conducted by the University of Southern California, participants were interviewed by a virtual human program that was designed to identify symptoms of depression and other mental illnesses (Abrams). Some participants were told that a person was controlling the virtual human while others were told that it was a completely automated process (the latter of which was true). Researchers found that those who believed they were only interacting with a human were more honest and disclosed

more about themselves than those who believed a person was listening in. Furthermore, they also found that people were more open with their facial expressions and more likely to express signs of intense sadness in their face when they did not think a human was watching. Some people believe a lack of empathy to be detrimental, but it actually proves to have a surprising positive effect. A lot of people generally have a fear of disclosure and will withhold personal information out of fear of human judgment. Similarly, they may cherry pick the information that they do share because they want doctors to see them in a good light. Talking to a machine eliminates this vulnerability and possibility of criticism. There is no emotional connection there. This honesty, in turn, can help improve diagnoses, a growing problem in the healthcare industry when considering that 12 million adults in the United States each year are misdiagnosed (Firger). And when people are not honest with their practitioners about things they may feel ashamed of, it only makes it that much harder to properly diagnosis their illness. Thus, something that may initially be perceived to be a flaw or drawback actually has an apparent benefit.

V. Counterarguments

One possible counterargument is that perhaps complete honesty is not all it is made out to be. People are honest with a machine because there is no emotion or intimacy involved in the interaction so they do not care what a computer thinks of them. A machine looks at things objectively with the data that they are given in comparison to the data in their system. They do not pass any subjective judgment on the information they are being fed. Therefore, there is no shame in telling a robot that does not care that one smokes a pack of cigarettes a day since it does not think any less of a person for their decisions. This is the same reason behind the benefit of people being more honest with machines but in a negative light. If one does not feel shame for their poor health decisions, they might not feel any incentive to change. Sherry Turkle writes in

her novel “Alone Together” that disclosing health information to a healthcare professional is not just about being able to share something normally private but about being able to talk to someone who can “push back”. A machine might be able to chide someone for not drinking enough water, but there is no weight in its words. It does not actually care whether or not someone changes their behavior; it has simply been programmed to tell them to do so. This again circles back to the issue of empathy. Normally a doctor or nurse will tell someone to get better—and they actually care that the person does. Knowing that someone cares about a patient’s health and that this same person will check up and ensure they are taking care of themselves can have positive psychological effects. It is reassuring to know that someone cares and will hold their patients accountable. Furthermore, it actually gives patients a reason to better their habits because if they do not, they will have to answer to a disappointed professional with whom they have now created a relationship.

Another potential counterargument is that a lack of empathy may cause miscommunication between machine and person. Hospital visits can be a time of high stress and emotional difficulty, which already hinders communication between a doctor and patient as is. People are anxious, fearful, and want to know that they are receiving the best care. However, a machine cannot reassure people the same way a human could. After all, the healthcare industry is a service industry, and service industries emphasize workers be personable and build connections with those they are helping. When asked to rank the importance of 22 different attributes of healthcare ranging from access to technology, both physicians and patients in focus groups ranked doctor-patient relationship at the very top of their lists (Pearl). People crave connection. For example, a human doctor could tell a 7 year old Benny about the time that her son had chicken pox just like how Benny does and how he was really frightened at first but then when he

was recovering he got to stay home from school and get a plethora of get well cards from his friends. Benny may feel reassured knowing that the doctor's son has gone through something similar and ended up just fine. A machine has no ability to reassure and appeal to patients' emotions like this because there is no common ground between a person and a machine. In fact, positive perceptions of common ground have proven to be associated with better recovery and emotional health after an appointment (Stewart). But in cases where the robot and human have no connection, there can be a decrease in perceived quality of care from the person's perspective because there is no bond. Machines will always lose in this aspect simply because they are machines. They will never undergo the same pain and ergo cannot empathize the way humans want them to.

However, though human traits may be essential to the quality of some aspects of healthcare, this does not mean that machines could not significantly improve the current system by playing a larger role in other areas that they far surpass humans in. In order to determine which roles machines would be most useful in, it is imperative to evaluate how roles in healthcare have evolved in addition to their current trajectory as technology becomes further integrated into hospitals.

VI. The Shifting Role of the Physician

Technology has already changed the physician's role by changing the tasks they use their time for. In 1972, the first electronic medical record system was developed, and many hospitals migrated from keeping patient records on paper to electronically. Electronic health records (EHRs) were a significant upgrade because in comparison to paper records, they provide quick access to patient records, minimize errors caused by illegible handwritings or misspellings, and maximize cost-efficiency. In fact, they seemed so superior to paper records that changes were

made to how insurance companies and the government pay for medical care so if hospitals "meaningfully use" EHRs, they receive an incentive payment and, introduced more recently, if they do not, they get reductions in funding (Conn). "Meaningful use" means that it is not enough for doctors to just update the record every now and then and secure the funding. They must document patient care on the computer thoroughly enough that their time spent on the EHRs proves to be worthwhile to those evaluating the hospital's use rather than just minimum completion. Because of this, there has been a great increase in the amount of time a physician spends doing this sort of administrative work. A 2016 study found that physicians spend only 27.0% of their time directly interacting with patients and 49.2% of their time working on the EHR or deskwork (Sinsky et al.). In fact, even during in-person appointments, a physician spends 52.9% of the time actually talking to the patient and 37.0% updating the EHR or other paperwork. The work does not stop there either. Outside of the hospital, physicians report spending another one to two hours of personal time each night just to carry out additional EHR tasks. The advent of the EHR has caused the role of the physician to be less of a patient-facing job than it used to be as they are forced to do more computer work to secure funding. When also taking into consideration a 2018 survey that reported that 56% of physicians who report feeling burnout attribute it to having too many bureaucratic tasks, it seems clear that the way in which the EHR is being implemented is taking a negative toll on physicians themselves (Peckham). Though the EHR is undoubtedly beneficial in minimizing mistakes and increasing the efficiency of the healthcare system in some regards, it certainly is odd to have doctors spend four years in an undergraduate program, four years in medical school, and a minimum of three years for residency to end up spending 49.2% of their time updating information on a computer. It seems

that some of the major roles of the physician are being less and less intellectually difficult as technology becomes increasingly integrated into hospitals.

Yet in contrast, nursing originally began as a caretaking role with little education needed but has actually grown to be a more academically rigorous profession. Just 50 years ago, nurses were trained on the job (Johnson). For any clinical questions, nurses consulted the Kardex, cardstock information sheets that were completed and updated in pencils. The Kardex held thorough instructions on how to treat patients and included information on their type of diet, level of activity permitted, orders for comfort measures, and other important material. The instructions were detailed enough that nurses did not necessarily need much additional training on patient care because the tasks that they were asked to do were simple. Nurses were seen more as caretakers and errand-runners than as professionals with any clinical autonomy. However, in order to become a nurse today, one needs to be highly trained, well educated, and hardworking. Edna Astbury-Ward, a nurse and educator at the University of Chester, states that the decisions nurses make today would have been made by doctors 50 years ago (Johnson). In fact, in 18 states today, nurses can work as independent primary care providers and have their own practices. No longer is a nurse seen as dependent on other physicians. However, one thing that has stayed constant throughout the history of nursing is an emphasis on caring. Nursing school teaches its students to be kind, patient, and warm. It emphasizes these interpersonal qualities more than medical school does, which has led to the current societal expectation that patients will interact more with nurses and have more personal, warm exchanges with them since they have to prime them for their appointment. Nurses maintain relationships with their patients, caring for them while still possessing the healthcare knowledge to administer medicine or provide primary care.

Therefore, nurses today are knowledgeable enough to make clinical decisions and often

run down the details of a patient's condition or treatment plan with them while also constantly showing warmth and empathy. Based on this, as well as the rise in proportion of bureaucratic tasks for a physician, nursing is the role a human would thrive in most whereas a machine would be less optimal. In the current healthcare system, a patient sees their nurse before their doctor and relays primary information to him or her. They expect to have a warmer interaction with them than with a doctor. After all, that is why society holds the stereotype that nurses are women. The nurse role has always been painted as a caring, nurturing one full of understanding and patience. However, doctors are not always seen in such a manner. This is why I believe doctors should be automated. These facts suggest that replacing a human doctor would not drastically or negatively affect the patient's experience. Machines should do all of the bureaucratic tasks doctors have been forced to do as well as take over their other duties.

In regards to the fact that people are often more honest with machines, in the current division of labor between nurses and doctors, nurses normally collect preliminary information about the patient, including any health information that they like to share. Doctors will follow up on this information. In order to maximize this honesty effect, the current division should remain. Some people (normally older individuals) may feel unnatural or uncomfortable disclosing health information to a robot in which case they would simply relay their information to the nurse. However, based on the previously mentioned studies, more people would be more honest about things like smoking and/or drinking habits, which would help create more accurate profiles of the patients. Having a human nurse would also balance the "lack of shame" counterargument of having a machine physician. A person will still be there in a professional capacity to hold a patient accountable and also to share a connection with. Furthermore, certainly automating the actual diagnosis of patients would be beneficial due to the aforementioned issue of 12 million

adults in the United States being misdiagnosed a year. This is one area where machine is clearly superior to human. A machine should diagnose as well as offer treatment plans because these are decisions that would only strengthen in likelihood of being correct the more information that can be referenced to make it. A machine has more computational skill and can easily refer to a database of other similar cases that it has access to. Simply put, when there are thousands of diseases and illnesses, it is unrealistic to expect a human doctor to be able to correctly assess a patient's condition as well as a computer can. However, a nurse can still make other lesser important clinical decisions that are more attuned to patient wants rather than needs and can care for their patient so that the quality of care would not decrease. Thus, for the benefit of the actual health of the patient, it seems that this mixed approach would be wiser and mitigate possible negative effects while actually improving the possibilities of being correctly diagnosed and treated.

In order to fix some of the issues in the healthcare industry but still fulfill patients' desire for human connection, it would be of best interest to place machines in this role that requires less patient interaction or more strenuous computations while keeping nurses human. This way, there is still someone to scold a patient for excessively drinking alcohol whose words actually matter, a person who can help calm a crying child down before her shot while society can still reap the benefits of artificial intelligence since it can diagnose people better, be placed in rural areas that lack access to healthcare, and help decrease the increasing shortage of physicians.

VII. Conclusion

Artificial intelligence is not a magical solution that will fix every problem in the healthcare industry. However, it would undoubtedly benefit many people. I do not believe every practitioner should be replaced with a machine at this time, as I believe human communication is

still important in many cases since people currently value things such as common ground and face-to-face communication. But in a time where the number of healthcare workers is dwindling, wait times are longer, and access for those living in rural areas is near impossible, having machines readily available seems to be a fair fix for a problem that has yet to meet a long-lasting solution thus far. Once some physicians are automated, people will become more at ease with this concept and the negative effects previously discussed will lessen. All of the drawbacks mentioned—quality of care going down because of lack of common ground, ability to feel comforted by robots, and shame in disclosure—are certainly not permanent and could be minimized the more and more people get used to robots in their everyday lives. Though some will never be completely eradicated (such as the lack of a common ground between robots and people), the values that people hold may shift as we realize the rise that occurs in the effectiveness of the healthcare industry as a whole as a result of automation, and these drawbacks may not be considered to be big enough to stop automation. Furthermore, older people are more likely to be weary of technology so as this technology develops and as the younger generation begins to take hold, it is likely that less resistance and more acceptance will occur. I believe automation in healthcare is inevitable and that our conception of what it means to have a doctor's appointment will likely shift over time. The problems people have with artificial intelligence now are largely a matter of culture. Though automation in the healthcare industry certainly has some costs, I believe that these negative effects are outweighed by the benefits, will be mitigated by retaining human nurses, and will also significantly decrease as our conceptions of AI and the healthcare system shift, leading machines to be able to solve pressing problems in the industry that have presently only been becoming more severe.

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