

Exploring Gender: Beyond the Binary, Sorites Paradox, Fuzzy Logic, and Multidimensional Model

Chang Xu^{1,a,*}

¹Sayre School, Kentucky, 40508, The United States

a. katherinexu0525@gmail.com

*corresponding author

Abstract: The study of gender frequently employs a conventional binary framework to examine this subject matter. In recent years, there has been an increasing recognition of new gender identities beyond the traditional binary system. This study employs a literature review method to establish a comprehensive understanding of the concept of gender. Additionally, it endeavors to ascertain the number of genders by employing fuzzy logic and Sorites Paradox as analytical frameworks. As a result, greater examination of this method gives rise to ethical considerations, such as the justifiability of categorizing particular features as feminine or assigning a value to their degree of femininity. To effectively tackle this issue, the author has put up an alternative framework that acknowledges the intricate and multifaceted aspects of gender, so offering a fresh lens through which to comprehend gender dynamics.

Keywords: gender identity, genderqueer, Sorites Paradox, fuzzy logic

1. Introduction

Prior to embarking on an investigation into the quantification of gender, it is imperative for scientists to initially build an in-depth understanding of the fundamental concept of gender. The concept of gender has historically been perceived as a dichotomous categorization, with individuals being classified as either male or female. Nevertheless, the traditional binary gender paradigm is subject to certain restrictions. Initially, this phenomenon creates a void in philosophical elucidation and comprehension, as it proves inadequate for persons who refuse to adhere to the rigid classification of gender into male and female [1].

Within the population that opposes such classification, there exists a diverse spectrum of gender identities and manifestations [2-4]. Certain individuals may encounter a disparity between their personal gender identity and the societal expectations that adhere to a binary framework [5]. An illustrative instance can be found in the extant “Muxe” phenomenon observed within the Zapotec indigenous people residing in Oaxaca, Mexico. Muxes refer to individuals who are assigned male at birth who self-identify and articulate their affiliation with a distinct third gender, exhibiting certain attributes that encompass elements of both male and female identities. The individuals under consideration possess a distinctive amalgamation of traits that derive from conventional conceptions of masculinity and femininity [6]. The examination of the Muxe phenomenon provides unique perspectives on the comprehension and lived experiences of gender that extend beyond the conventional binary framework. This perspective challenges existing societal beliefs around gender roles and offers an alternative viewpoint that promotes the recognition and acceptance of gender

diversity. The conventional binary gender system, conversely, perpetuates and upholds inflexible gender norms and expectations through the assignment of certain attributes, behaviors, and responsibilities to each gender. The curtailment of individual expression can potentially hinder opportunities for human development and the attainment of self-actualization.

In this paper, the author initially employed the Sorites Paradox, a philosophical conundrum pertaining to the inherent ambiguity of concepts, alongside fuzzy logic, a logical framework that accommodates varying degrees of truth, in order to ascertain the quantification of gender categories. Through the concurrent utilization of these concepts, it can be contended that the comprehension of gender surpasses a binary framework, embracing a vast spectrum of potentialities. Subsequently, the study will examine the ethical implications associated with the research endeavors aimed at delineating the concept of gender. Ultimately, the study developed an enhanced model that enables individuals to effectively navigate and explore their gender identity by drawing upon personal experiences and self-perceptions.

2. First Approach: Sorites Paradox and Fuzzy Logic

Exploring gender through the lenses of Sorites Paradox and fuzzy logic represents a significant advancement beyond binary thinking [7]. Nevertheless, it is crucial to recognize that this model still possesses imperfections.

The Sorites Paradox, as defined by the Stanford Encyclopedia of Philosophy, describes paradoxical logic that arises from the usage of vague terms with unclear boundaries [8]. For instance, terms like “bald,” “tall,” and “old” are considered vague because there is no precise distinction between individuals who possess these qualities and those who do not. One of the most well-known examples is the concept of a “heap.” The paradox states that:

Proposition 1: 1 grain of wheat does not make a heap.

Proposition 2: If 1 grain doesn't make a heap, then 2 grains don't.

Proposition 3: If 2 grains don't make a heap, then 3 grains don't.

...

Proposition 1,000,000: If 999,999 grains don't make a heap, then 1 million grains don't.

Conclusion: 1 million grains don't make a heap.

In this particular instance, while possessing a rudimentary comprehension of the concept of a heap, it is unfeasible to ascertain a certain grain of wheat that serves as the determining factor for classifying an entity as a heap or otherwise, owing to the ambiguous nature of the assertion. Therefore, if a single grain cannot be considered a heap, it logically follows that two grains also cannot be considered a heap, and this line of reasoning continues in a similar fashion. Consequently, this line of reasoning culminates in the seemingly paradoxical assertion that irrespective of the quantity of wheat grains under consideration, they fail to constitute a heap. The Sorites Paradox introduces a paradoxical argument that challenges our intuitive understanding by yielding an unforeseen result despite the apparent validity of its premises and logic.

The paradox can be applied to the study of the number of genders. It can set the level of womanhood of a range from 0 to 1, where 0 represents having no feminine characteristics, while 1 represents having all the feminine characteristics [9]. When engaging in such endeavors, the researchers encounter similar challenges in establishing rigid definitions and fixed boundaries. It has been determined that gender is a multifaceted and intricate social construct that is shaped by various cultural, psychological, and personal factors.

Indeed, this paradox can be handled within the framework of fuzzy logic. According to the Stanford Encyclopedia of Philosophy, fuzzy logic serves as a modeling tool designed to facilitate logical reasoning in situations involving imprecise or vague statements [10]. By incorporating fuzzy logic, researchers can effectively capture and represent the nuances and gradations of information,

allowing for a more realistic and flexible approach to reasoning. Unlike classical logic, fuzzy logic assigns objects “degrees of truth,” which range from 0 to 1, including an infinite number of values. Likewise, it can link “degrees of truth” to the level of “womanhood”, and from that come to the conclusion that there are an infinite number of possible genders.

While the concept of gender encompasses an extensive range of possibilities, it is theoretically implausible for any conceivable gender to be manifested in reality due to the requirement of an endless population size. The difference between possible genders and actual genders lies in the distinction between theoretical or conceptual possibilities and the lived experiences and identities of individuals. Possible genders refer to the broad spectrum of potential gender identities that can exist beyond the traditional binary understanding of male and female. These possibilities encompass a range of identities, such as non-binary, genderqueer, genderfluid, agender, and many more.

Conversely, actual genders pertain to the gender identities that individuals subjectively identify with and encounter in their lived experiences. Individuals express and navigate various lived realities and self-identified gender identities in their everyday experiences. Contemporary understandings of gender acknowledge and uphold the multifaceted nature of people’s gender identities, surpassing mere theoretical frameworks and embracing the distinctiveness of each individual’s self-perception. Possible genders are a reflection of the intellectual comprehension of gender diversity, but actual genders pertain to the distinct manifestations and expressions of gender identities as personally encountered by individuals in reality. When examining genders from a theoretical perspective, a multitude of potentialities become apparent. However, in practical terms, the quantification of the number of genders appears to be an insurmountable task. These lived experiences acknowledge and honor the multiplicity of gender identities, surpassing just theoretical conjectures.

3. Ethical Concerns in Research

However, a significant objection to the first approach described above derives from Sally Haslanger’s gender normativity argument. In Haslanger’s influential work on race and gender, she stated that defining women can potentially result in privileging certain women while marginalizing others, and reinforce current gender norms [11]. A key component of the social science research process is ensuring that the work adheres to ethical principles; if Haslanger is correct that the act of identifying and defining gender is morally wrong, then the scientists should not pursue their task at all.

Haslanger’s perspective prompts a critical examination of the potential consequences that come with defining gender. While definitions can provide clarity and understanding, they also run the risk of oversimplifying complex and diverse experiences. By attempting to fit gender into neat categories, there is a possibility of overlooking or negating the lived realities of individuals who do not fit within these predefined boundaries.

There remains an argument posited by certain individuals that the process of defining gender does not necessarily entail oppressive implications, but rather has the potential to provide validation for certain individuals. Indeed, the establishment of precise gender definitions is of utmost importance in the context of fostering inclusive societies that encompass a wide range of gender identities. Nevertheless, the use of this particular concept may result in the marginalization and exclusion of certain individuals. The establishment of stringent boundaries, which entails the inclusion of specific individuals within the stated parameters, inadvertently poses the potential to exclude those who do not precisely conform to the required standards. To foster a more inclusive community, it is imperative to acknowledge individuals, such as those who identify as nonbinary, based on their self-identification.

4. A New Approach: Multidimensional Model

As seen from the aforementioned analysis, there exist certain constraints associated with the utilization of Sorites Paradox and fuzzy logic. To begin with, it is challenging to ascertain the specific attributes that would be classified as feminine. Moreover, it raises ethical concerns to assert the existence of a singular paradigm of womanhood, even if we were able to delineate what characteristics would be classified as feminine. This is because there are individuals who exist beyond the confines of the traditional gender binary, rather than fitting neatly within it.

This paper aims to propose an alternative model that considers the intricate and multifaceted nature of gender expression, which is shaped by diverse cultural, psychological, and personal influences, as previously discussed. The thesis presented here draws inspiration from Elizabeth Spelman's particularity argument, wherein she posits that the construction of gender cannot be divorced from considerations of race, class, ethnicity, and nationality [12].

In lieu of employing a unidimensional continuum to assess the degrees of veracity pertaining to femininity, it is possible to formulate a multidimensional framework. The purpose of this approach is to assist individuals in identifying a suitable role or identity, rather than serving as a rigid framework for defining and confining one's gender. The most ideal model would have an infinite number of axes for people to explore, yet the author prefers to only utilize three axes to construct a more concrete and easily understood model so people can get a general idea of what it is. Here is a brief description of the system:

X-axis: biological factors

Y-axis: class

Z-axis: race

Combining all the axes together, one would get a coordinate point, in which it corresponds to one's gender identity. There are still potential problems with this model — especially when the model is only three dimensional: which authority gets to define the XYZ values for a certain gender? How can we ensure people still have autonomy in choosing their own “numerical” values for their gender? To make sure we don't replicate binary ideas?

This research would like to clarify that the multidimensional model is intended solely as a self-exploration tool to assist individuals in understanding and identifying their gender. The model functions as a conceptual structure enabling individuals to traverse and investigate their gender identity, rather than enforcing rigid definitions. The primary objective of this tool is to serve as an initial platform for individuals to engage in introspection and exploration of oneself, enabling them to establish their own subjective numerical assessments for each dimension, drawing from their distinct personal encounters and self-perceptions. The concept seeks to provide support to individuals in their process of comprehending and articulating their gender identity by placing emphasis on autonomy and self-definition. Determining the precise number of genders poses a considerable challenge for scientists due to the multitude of factors at play. The complex interplay of various axes, dimensions, and potential combinations renders the task of identifying and quantifying each distinct gender an insurmountable endeavor.

5. Conclusion

In short, the act of critically evaluating gender via a lens that extends beyond binary frameworks presents various viewpoints. By employing theoretical frameworks such as the Sorites Paradox and fuzzy logic, it becomes possible to critically examine the validity of rigid gender classifications while also recognizing the intricate and multifaceted aspects of gender identity. While these techniques demonstrate significant progress in comprehending the perception of identity, it is crucial to acknowledge their inherent limits. The act of assigning particular genders might give rise to ethical

considerations by perpetuating societal standards and disregarding the experiences or identities of certain individuals.

Hence, the implementation of a multidimensional framework is a potential avenue for enhanced inclusion of individuals who identify as non-cisgender. This approach acknowledges a range of elements that might influence an individual's subjective perception of their own gender identity. The intention of this technique is to facilitate self-exploration, rather than imposing strict categorizations on oneself or others that may not accurately reflect their own perspectives or actual experiences. The affirmation of varied identities and lived realities necessitates the prioritization of inclusivity, mutual respect, and human agency. This would effectively emphasize and commemorate the disparities within our society, namely pertaining to sexual and gender orientations.

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