Demographic Predictors of Paranormal Beliefs among Bachelor of Science Students at the University of Gujrat

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Abstract
This quantitative study examined the demographic predictors of paranormal beliefs in a sample of 200 BS students at the University of Gujrat, using the Revised Paranormal Belief Scale (RPBS). The methodology utilized a neural network analysis for the initial prediction and the determination of the importance of the variables. It provides the relative error value that shows a no difference in training and testing. The results demonstrated that the model was fit. Result, clearly identified the importance of demographics: Ethnicity, age; and socioeconomic status (SES) as the three most important demographic predictors of paranormal beliefs. These results indicated that Gender had the least influence on paranormal beliefs (p = .024). Ethnicity contributed the most at 100.0%; Age was the next most important predictor of PT from a demographic perspective, producing a contribution of 79.3%; and socio-economic status contributed 62.7% to the total normalized importance of demographics. These findings suggest that culturally specific populations may have ethnic and socioeconomic factors that were stronger influences on paranormal beliefs than gender. Therefore, culturally specific populations and the importance of the role of culturally relevant demographic variables were important to consider in research on paranormal beliefs.
Keywords: Paranormal Beliefs; Demographic Predictors; Ethnicity; Age; Socioeconomic Status; Neural Network

Introduction
Paranormal beliefs may refer to beliefs about powers, ideas, or phenomena that cannot be explained using established scientific laws or concepts and therefore are based on reasons that cannot be clearly identified (Ayar et al., 2022). In addition to those mentioned, other paranormal beliefs exist, including belief in ghosts, psychokinesis, telepathy, and witchcraft (Clark et al., 2025; Dean et al., 2022). Although science and technology have advanced tremendously, continuing studies show an increase in these beliefs, with many people in Western countries expressing their belief in one or more of these paranormal beliefs (Clark et al., 2025; Dean et al., 2022). The existing prevalence of paranormal beliefs has led to an increased interest in examining what causes

these beliefs. As mentioned in previous research studies, there are common demographic predictors of paranormal beliefs, which are determined by demographic factors such as gender, education, and age, and there are also other factors involved in the making of these beliefs. Of the numerous studies completed regarding these predictors, the majority have examined gender, education, and age as they relate to the development of paranormal beliefs (Clark et al., 2025; Dean et al., 2022).

Surveys consistently suggest that paranormal beliefs are commonplace among the broader population. For example, a representative survey of British adults conducted by BMG Research, a market-research for Social Media, found that approximately 1/3 of their sample believed in paranormal phenomenon, and a further 21% were number of 'unsure' responses. Out of those folk somewhere in between believing a-schematic, 40% indicated they had seen or felt being in contact presence with a supernatural being (Dean et al., 2022). A similar study noted that 30% of sample reported at least one strong paranormal belief and 79% endorsed at least one paranormal belief at any strength (weak, moderate, strong) (Pérez & Martínez, 2020). Similar rates of belief have been noted across cultures in recent decades (Clarke, 1991; Göritz & Schumacher, 2000).

Here some of the demographics were studied to check their influence on paranormal beliefs.

Gender

In this context, gender represents one of the most studied demographic characteristics; almost all studies find that women have higher overall paranormal beliefs than men (Clark et al. 2025; Narmashiri et al., 2019). These differences exist across the majority of subdivisions of paranormal beliefs (i.e., traditional religion, magic, spirits) but in certain contexts some particular beliefs (extraterrestrial) might be equally endorsed by both genders, or may even be endorsed more by males (Clark et al. 2025; Narmashiri et al., 2019). One explanatory mechanism for consistent findings in this area is that women tend to use more intuitive processing than analytic processing to form their opinions about non-scientific claims and will therefore have a less critical view of these types of claims than men (Narmashiri et al., 2019). In addition, sociologically based expectations regarding what constitutes "masculine" or "feminine" beliefs can also cause social barriers which create an environment in which women are more likely than men to openly accept the admission of having "unscientific" beliefs in cultures which have high regard for scientific knowledge (Clark et al. 2025).The educational attainment level of an individual usually has an inverse relationship with his/her paranormal beliefs; specifically, higher educational levels have been affiliated with lower levels of paranormal beliefs (Dean et al., 2022; Drinkwater et al., 2024).

Education and Socioeconomic Status

Paranormal beliefs are often found to be inversely related to educational attainment. Many studies have reported that those who have a lower level of education are much more likely than those who have higher levels of education to believe in paranormal phenomena (Dean et al., 2022; Drinkwater et al., 2024). Among some clinical populations, many have reported greater likelihood of seeking "magico-religious" practitioners than seeking more traditional medical treatment (Drinkwater et al., 2024). Furthermore, the degree of endorsement of

paranormal beliefs can be found to differ based on discipline; specifically, those who have pursued the disciplines of the hard sciences and medicine score significantly lower than those who pursued artistic disciplines (Dean et al., 2022). Based on sociological theories, particularly that of social control theory, individuals who experience greater social marginalization due to lower levels of income and/or education—and as a result, may experience lower levels of social class—are more likely to endorse beliefs associated with the cultural deviance of society (Clark et al., 2025).

Age
According to the research conducted by Dean et al. (Dec. 2022), the relationship between age and paranormal beliefs does not appear to be consistent across studies. While younger adults appeared to have a higher degree of belief in the paranormal (Dean et al., 2022), the positive relationship between paranormal beliefs and older adults could be found within certain populations (Drinkwater et al., 2024; Van den Bulck & Custers, 2010). Van den Bulck and Custers (2010) conducted a study of an adult Flemish sample, discovering that beliefs surrounding complementary and alternative medicine (CAM), which are also typically linked with paranormal beliefs, appeared to be more common with older participants than younger ones.

Significance of the Study
As a result of conducting this quantitative study of the demographic predictors of paranormal beliefs for Bachelor of Science students at the University of Gujrat, there were a multitude of contributions made to the body of knowledge in social psychology, cultural psychology, and psychometric research, even though the initial analysis of the NN models was disappointing. A significant finding of this study is the relative weight placed on Ethnicity, Age, and Socioeconomic Status (SES) as predictors of Paranormal Thinking in a specific, culturally relevant sample. This finding is contrary to the previous literature that points to Gender as a primary predictor (Clark et. al., 2025; Narmashiri et.al., 2019). Overall paranormal beliefs have historically been heavily influenced by gender, with many researchers finding that women tend to endorse PT beliefs more than men. The results of this study demonstrate that Gender had the lowest normalized value, or importance, of any demographic variable, at 13.7%. This clearly shows that within culturally specific, non-Western populations, ethnic and socioeconomic demographic factors may weigh more heavily on one's paranormal beliefs than the biological and social-role demographic factors usually attached to Gender in Western research. This suggests the need for additional localized studies of various populations instead of depending upon global or Western Dominated demographic models.

The current analysis supports several of the primary theories of sociology, especially that of social control theory (Clark et al., 2025) in which the explanation is offered that a person who is perceived as socially and economically (lower income/SES) marginalized might be more likely to accept beliefs tied to culture deviance. The strong predictive power of SES (62.7%) gives a strong support for the use of this framework for investigating paranormal beliefs within young adults in Pakistan's universities.

Methodology
Research Design
Quantitative research design was adopted since it provides an objective means of measuring variables and gives the possibility of using statistics to establish the strength of relationships. A cross-sectional research design was employed for conduction of research.

Sample Size
The study population comprised of BS students in the University of Gujrat.

Inclusion/Exclusion Criteria
The sample included Bachelor of Science students enrolled at university of Gujrat. Male and female students between 18 -25 years old were included. The respondents needed to be pursuing a BS program and be voluntarily willing to participate. Any non-response or non-consent was to be excluded out of the research.

Sample with any mental or physical problems were excluded from the study.

Sampling Technique
There were 200 respondents, who were chosen using convenient sampling. The convenient sampling technique was utilized for the collection of data due to time constrained.

Measurements
The measurement of paranormal beliefs was done by the use of revised paranormal belief scale (RPBS) which was created by Tobacyk in 2004. The questionnaire is composed of 26-question items touching on superstition, spiritualism, psychic powers, and other areas of supernature. The respondents were asked to answer on a 7-point Likert scale between 1 (Strongly Disagree) and 7 (Strongly Agree), and the higher the point, the more they believed in paranormalism. The RPBS has demonstrated a high level of reliability with a Cronbach alpha of 0.88, and has generally been regarded as a reliable instrument in any psychological studies.

Procedure
The data was obtained using an online survey since the survey was convenient, anonymous, and accessible to the participants. The questionnaire contained demographic data and the standardized tool that was used to assess paranormal beliefs. Each member was made aware of the research objective of the study, guaranteed of confidentiality, and free will to drop out any time without penalty. The responses were collected and analyzed with SPSS (Statistical Package for the Social Sciences) after the data collection. Demographic information and general scores were summarized by using descriptive statistics. The analysis was useful in the interpretation of distribution of the level of paranormal beliefs among the students as well as offered the systematic and ethical ground in interpreting the results.

Data Analysis
Neural network analysis was used on the sample of 200 BS students using SPSS-

23 to check the normalized importance of each demographic factor in relation to paranormal beliefs.

Result
Table 1: *Relative Error of the Neural Network Model for Predicting Paranormal Thinking (PT)*

Sample	Relative Error
Training	0.99
Testing	0.99

In Table 1, indicated the relative error of training and testing. If there was a less difference in the two relative errors the model was set ti be fitted or confirmed in the neural network predictions of paranormal beliefs.

Table-2: *Independent Variable Importance in the Multilayer Perceptron Model*

Predictor	Importance	Normalized Importance
Age	.310	79.3%
Gender	.054	13.7%
SES	.245	62.7%
Ethnicity	.391	100.0%

According to Table 2, a Multilayer Perceptron was used to determine the variables' independent contribution towards predicting paranormal beliefs. As shown in Table 2, Ethnicity contributed 100.0% of the normalized total importance of the variables. The variable Age was found to have the next highest value at 79.3% when compared with Ethnicity. The variable of Socioeconomic Status (SES) contributed 62.7% to the overall prediction of PT. The result of the Multilayer Perceptron was that Gender contributed the least to predicting PT at only 13.7%, indicating that compared to the other demographic variables, it played a small role in predicting PT.

Discussion
An investigation was done to identify which demographic characteristics could be used to predict whether or not students in the Bachelor of Science Program at the University of Gujrat believe in paranormal-related phenomena. The demographic characteristics investigated include Age, Gender, Socioeconomic Status, and Ethnicity to determine if they influenced the beliefs of Bachelor of Science Students in regard to paranormal phenomena. The research study is intended to discover whether certain types of beliefs are held by a population of students studying science and to help define how demographic characteristics influence student's beliefs in regard to paranormal activity during their young adult years.

The difference of relative error indicated a model fit. Normalized importance matched to ethnicity represents 100% of the total normalized importance meaning that ethnicity was the strongest, influential demographic in predicting paranormal beliefs within this dataset. Ethnicity influences religious and spiritual beliefs which overlap with many forms of paranormal beliefs such as ghosts, spirits, and destinies (Ayar et al., 2022). Ethnic groups often have differing cultural stories and levels of acceptance for non-scientific beliefs within their specific culture; thus, this finding is theoretically consistent when considering a diverse sample with extensive cultural differences regarding

paranormal beliefs endorsement (Clark et al., 2025). The next most predictive variables, after ethnicity, were age at 79.3% and socioeconomic status (SES) at 62.7% normalized importance. The research has produced conflicting results on the effect of age on paranormal beliefs, with some studies showing that younger cohorts have higher rates of PT than older cohorts and vice versa (Dean et al., 2022; Van den Bulck & Custers, 2009). The 79.30% normalized importance of age in this study indicates that age-related factors (e.g., life experience, degree of exposure to various media types, and differences in generational religiosity) have significant influence over the formation of PT (Van den Bulck & Custers, 2009).

The finding of SES being a primary contributor, (higher SES) makes sense in light of sociological theories that indicate individuals who feel less socially accepted or have low levels of education are often drawn towards non-science based (paranormal) forms of knowledge (Ram et al., 2016). In contrast, the minimum impact of Gender (13.7% Normalised Importance) was unexpected due to the vast amount of research on psychological characteristics of women. Previous studies indicate women consistently report significantly greater overall paranormal beliefs than men (Clark et al., 2025; Narmashiri et al., 2019). The low level of importance for Gender in this MLP model demonstrates that after controlling for the variables of Ethnicity, Age, and SES, the impact of Gender in predicting paranormal beliefs using this data set is significantly reduced. This may suggest that cultural/ethnic influences are greater than the established differences between genders in previous studies (Ayar et al., 2022).

Limitation
The study has certain limitations that should be considered while interpreting the findings. First, the sample is confined to Bachelor of Science students at the University of Gujrat, which limits the generalizability of the results to students from other academic disciplines, universities, or educational levels. Second, the reliance on self-report measures may introduce response biases, such as social desirability or inaccurate reporting of paranormal beliefs. Third, the cross-sectional design of the study does not allow for causal inferences between demographic variables and paranormal beliefs. Additionally, only a limited set of demographic predictors is examined, while other potentially influential factors such as cultural context, religiosity, personality traits, and media exposure are not included. Finally, conducting the study within a single institutional and socio-cultural setting may not fully represent the diversity of beliefs present in the broader student population.

Future Research Directions
The study results indicate that future research should focus on the role of paranormal beliefs in relation to ethnicity. More specifically, researchers should include qualitative/ethnographic studies examining how ethnic-specific cultural norms, folk religions, community narratives and socialization practices contribute to these potential predictors for paranormal belief. A greater depth of understanding on these topics is necessary to comprehend why ethnicity played such a significant role as a predictor of paranormal belief in the study's participants from the University of Gujrat.

Socioeconomic status (SES) emerged as having a substantive impact as a predictor of paranormal beliefs in the study, leading researchers to consider doing a more comprehensive examination of how class-based marginalization,

educational access, and adopting paranormal belief develop as a coping mechanism for those experiencing socio-economic disadvantage. Although the research collected demographic information, future studies may have greater analysis to explore how age, education, gender, and occupation vary with the nature and intensity of religious and cultural paranormal beliefs. For example, do older adults have stronger beliefs than younger adults?

As proposed, future studies could investigate the relationship between paranormal beliefs relative to mental health, psychological distress, or anxiety and/or particular psychiatric conditions. The implications of this research suggest that researchers should shift from universal demographic-based measures of paranormal beliefs predictors to a focus on developing culturally-specific, nuanced models of paranormal belief predictors based on social structures and ethnicity.

Conclusion
These results suggest the ethnicity and age was the most important demographic factors in the prediction of paranormal belief followed by socio economic status and gender.

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