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# ETHNICITY, SOCIAL STRATIFICATION AND ACADEMIC PERFORMANCE AT PUBLIC UNIVERSITIES IN PAKISTAN: A CROSS-SECTIONAL SURVEY AT PMAS-ARID AGRICULTURE UNIVERSITY RAWALPINDI

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## Abstract

*Background: Higher education is widely expected to be meritocratic, yet evidence from several countries shows that ethnicity and social class shape who succeeds. Little is known about this in Pakistan's agricultural universities. Methods: We analysed a cross-sectional questionnaire survey of students at PMAS-Arid Agriculture University Rawalpindi (PMAS-AAUR) collected in two batches (193 returned questionnaires). After data-quality screening and applying the inclusion criteria, 152 students with a valid cumulative GPA (CGPA) were analysed (148 with known ethnicity: 92 Punjabi, 26 Saraiki, 14 Pashtun, 16 other). We compared ethnic groups on CGPA, socioeconomic status (SES), academic resources, cultural and linguistic capital, perceived ethnic discrimination, campus inclusion and social support, and fitted hierarchical regression models with heteroskedasticity-robust standard errors. Results: CGPA did not differ by ethnicity (Punjabi 3.42, other groups 3.40; difference −0.02, 95% CI −0.16 to 0.12), and ethnicity remained unrelated to CGPA after adjustment for SES, rural background, prior attainment, English-language capital and the other social factors. Ethnic groups also did not differ on SES, resources, cultural or linguistic capital, or perceived discrimination; Punjabi students were more often from rural backgrounds. Higher prior attainment predicted higher CGPA. Perceived discrimination was endorsed widely (91% reported at least one experience "sometimes" or more often) and correlated negatively with CGPA (r = −.29; batch-adjusted r = −.20), whereas English-language capital was the strongest correlate of feeling included (b = 0.49). Interactions between ethnicity and SES, rurality or language were not significant. An unplanned pattern, a lower CGPA for non-Punjabi students in the second collection batch only (−0.17 points), is reported as exploratory. Conclusions: We find no evidence of a sizeable ethnic gap in CGPA at PMAS-AAUR, and can rule out gaps*

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*larger than about 0.16 grade points. Perceived unfair treatment and weak English-language capital are nonetheless associated with lower performance and belonging, which points to inclusion and language support rather than ethnicity as such. Limitations include self-reported GPA, small minority groups and non-equivalent collection batches.*

## INTRODUCTION

Higher education systems are built on the promise of merit, yet research from many countries shows that students' ethnic background and social class are associated with how far they progress. In the United Kingdom, a nationally representative study of more than 135,000 graduates found persistent
ethnic differences in the attainment of a good degree (Brophy, 2025); in Brazil, analyses of large-scale secondary-school data show that gender, race and economic status jointly shape outcomes (Betarelli et al., 2025). In countries with colonial and partition histories the picture is more complex. Work on Pakistan suggests that the legacy of the 1947 partition continues to shape educational attainment and that ethnic groups have followed different strategies of assimilation through education versus preservation of identity (Aslam et al., 2022).

Pakistan is a multi-ethnic country of more than 240 million people, including Punjabis, Pashtuns, Sindhis, Baloch, Saraikis, Hindko speakers, Kashmiris and Muhajirs. Access to higher education is uneven across income, region and gender (Rind and Malin, 2024), and financial constraints, parental attitudes and child labour are leading drivers of educational exclusion at the school level (Hamza and Cochrane, 2026). Language is a further axis of stratification: English-medium instruction can disadvantage students from rural and public-school backgrounds, who report difficulty with lectures, presentations and examinations (Muhammad, 2022; Amin, 2015). Commentators have also pointed to the "unspoken rules" of academic life that favour already-advantaged students (Salman, 2025).

This evidence is mostly about access to education or about schooling; far less is known about performance after enrolment, particularly in agricultural universities that enrol many students from rural areas. PMAS-Arid Agriculture University Rawalpindi (PMAS-AAUR) is a public university that draws students from Punjab, Khyber Pakhtunkhwa, Azad Jammu and Kashmir, and elsewhere. To our knowledge, no quantitative study has examined whether ethnicity and social stratification are related to academic performance there, or how students perceive discrimination and inclusion.

This paper reports the quantitative strand of a planned sequential explanatory mixed-methods study.

Guided by the study's four objectives, we ask:

**RQ1.** Do students from different ethnic groups differ in academic performance?

**RQ2.** Do ethnic groups differ in the factors associated with social stratification (SES, rural background, resources, cultural and linguistic capital) and how do these factors relate to performance?

**RQ3.** Do ethnicity and social stratification factors intertwine, that is, does the association between ethnicity and performance differ by SES, rural background or language capital?

**RQ4.** What do students report about discrimination, inclusion and support, and do these differ by ethnicity?

### Theoretical background

#### Cultural capital, ethnic capital and intersectionality

Bourdieu's concept of cultural capital refers to non-material assets, such as language competence, familiarity with academic norms and informal know-how, which help students convert family background into educational credentials

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(Bourdieu, 1986). Because schools and universities tend to reward the dispositions of dominant groups, performance can reflect inherited cultural resources as much as ability. Research on British Pakistanis suggests that "ethnic capital", the resources and aspirations circulating in ethnic networks, can offset class disadvantage, though unevenly across groups (Shah et al., 2010).

Intersectionality (Crenshaw, 1989; Collins, 2015) holds that systems of disadvantage interact, so that the combination of, for example, minority ethnicity and low income is not simply the sum of its parts. The empirical record is mixed. Brazilian data point to interplay between race, gender and economic status (Betarelli et al., 2025), whereas the UK study cited above found that statistically significant interactions between ethnicity, sex and socioeconomic status had negligible marginal effects and concluded that the evidence provided little support for the intersectionality thesis (Brophy, 2025). Conflict theory adds that educational outcomes reflect the wider social hierarchy (Salman, 2025).

**Language, stratification and discrimination in Pakistani higher education**

Studies of English-medium instruction in Pakistan describe students with weaker English struggling to follow lectures and technical terminology, avoiding questions and presentations, and receiving limited linguistic support from teachers (Muhammad, 2022). Related work links social background, school type and urban or rural origin to classroom participation and identity (Amin, 2015). Madrassa graduates face financial and cultural barriers to entering mainstream higher education (Nishat, 2023), and cultural adaptation has been associated with the grades of international students at a Pakistani university (Dilshad, 2020). Press reports describe discrimination against religious minorities in education (ANI News, 2025).

**Gaps addressed here**

Most of this work concerns primary and secondary schooling, access rather than attainment, or qualitative accounts. We contribute a quantitative comparison of ethnic groups on academic performance, stratification factors and perceived discrimination at a Pakistani agricultural university, testing the interplay of ethnicity with SES, rural background and language capital.

## Materials and methods

**Design, setting and data collection**

The study is a cross-sectional questionnaire survey of students at PMAS-AAUR, Rawalpindi, forming the quantitative strand of a sequential explanatory mixed-methods design. The structured instrument (Appendix A) comprised demographic and educational background (D1–D12), socioeconomic status (SES1–SES11), academic resources (R1–R10), cultural capital (CC1–CC10), linguistic capital (LC1–LC12), perceived ethnic discrimination (PD1–PD12), campus inclusion (CI1–CI12), social support and coping (SS1–SS10), and academic performance (AP1–AP4). Likert items used five response options. Returned questionnaires were entered into two data files ("batch A", 92 questionnaires; "batch B", 101 questionnaires). The planned semi-structured interviews were not part of the data analyzed here.

**Participants and inclusion criteria**

The target population was students currently enrolled at PMAS-AAUR. Following the study protocol, we retained respondents aged 18 years or older who had a valid cumulative GPA. First-semester students without a CGPA were therefore excluded through the missing-CGPA criterion; the data contained no field identifying international students, so that exclusion could not be applied. Table 1 shows the flow from returned questionnaires to the analytic sample.

**Measures**

**Outcome.** Academic performance was the self-

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reported cumulative GPA on a 0–4 scale (AP1); secondary measures were the most recent semester GPA (AP2) and the pre-university Intermediate/FSc percentage (AP4). Entries were validated for range, percentages stored as fractions were rescaled, and uninterpretable entries were set to missing. The planned verification of GPA against university records was not available.

**Table 1: Flow from returned questionnaires to the analytic sample.**

| Step | n | Detail |
|---|---|---|
| Returned questionnaires | 193 | batch A 92; batch B 101 |
| Excluded for data-quality reasons | −16 | 2 no Likert responses; 3 straight-lining; 6 duplicates; 5 copied responses (Section 3.4) |
| Retained | 177 | batch A 90; batch B 87 |
| Excluded: aged under 18 | −5 | all aged 17 |
| Excluded: no valid CGPA | −20 | unreported or unusable entries |
| **Analytic sample** | **152** | batch A 74; batch B 78 |
| Ethnicity known (ethnic-group comparisons) | 148 | 4 "prefer not to say", blank or ambiguous |
| Complete cases for regression models | 135 | listwise deletion across all model variables |

**Ethnicity.** Ethnic identity (D3) was self-reported. Because several groups were very small, we analysed four categories: Punjabi (the reference group, as planned), Saraiki, Pashtun, and "Other" (Kashmiri 5, Baloch 3, Sindhi 2, Hindko 2 and 4 other, n = 16). We also contrast Punjabi with all non-Punjabi students.

**Socioeconomic status.** We computed an SES index as the mean of the standardised scores of household income band (SES1), father's education (SES2) and mother's education (SES3). Difficulty meeting university expenses (SES11), scholarship receipt (SES9), distance from home (D12) and rural background (D7) were analysed separately.

**Psychosocial scales.** Scale scores were item means (computed when at least 80% of items were answered): academic resources (RES, R1–R8), cultural capital (CC, 10 items), English/linguistic capital (LC; LC1–LC8, LC11, LC12), perceived ethnic discrimination (PD, 12 items; higher means more), campus inclusion (CI, 12 items) and social support (SS, 10 items). Four negatively worded items (R9, R10, LC9, LC10) did not cohere with their scales when reverse-scored (corrected item–total correlations of −.28, −.24, −.21 and −.14), a pattern consistent with respondents reading them on the questionnaire's positive response key. They were therefore excluded from the composites; results with the instrument's original scoring are reported as a sensitivity analysis. Table 2 gives internal consistency (Cronbach, 1951).

**Table 2: Internal consistency of the composite scales (respondents retained after data-quality screening).**

| Scale | Items | n | Cronbach's α | Mean inter-item r |
|---|---|---|---|---|
| Academic resources | 8 | 161 | 0.72 | 0.25 |
| Cultural capital | 10 | 162 | 0.81 | 0.30 |
| English/linguistic capital | 10 | 167 | 0.78 | 0.26 |
| Perceived ethnic discrimination | 12 | 159 | 0.89 | 0.41 |
| Campus inclusion | 12 | 159 | 0.83 | 0.29 |

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|---|---|---|---|---|
| Social support and coping | 10 | 161 | 0.78 | 0.27 |

**Data cleaning**

The raw files contained entries that needed correction before analysis; every step was scripted and logged. Likert cells holding two answers (for example "4&5" or "2,3"; 65 cells) or values outside 1–5 (1 cell) were set to missing. Implausible ages (year-like values of 2022, and 53) were set to missing, units were
stripped from distances, and free-text semester entries were parsed. Sixteen records were excluded: two with no Likert responses; three with identical answers on every item (straight-lining); six that duplicated another record (identical answers on all 66 items, or the same age, ethnicity, distance and GPAs with at least 86% identical items); and five whose item responses were at least 92% identical to another respondent's despite different demographics (the 99.9th percentile of pairwise agreement among all other pairs was 70%). Results were unchanged when the duplicate and copied-response records were retained (Table 10).

**Statistical analysis**

Analysis followed the protocol: descriptive statistics; comparisons across ethnic groups using Welch's one-way ANOVA with eta-squared (with Kruskal–Wallis as a rank-based check), Welch t-tests with Cohen's d (Cohen, 1988) for Punjabi versus all other students, and chi-square tests with permutation p-values (10,000 permutations) because of sparse cells. We report 95% confidence intervals and, for the 14 group comparisons, Holm-adjusted p-values (Holm, 1979). Multiple linear regression of CGPA on ethnicity dummies (Punjabi as reference) was fitted in three steps: (M1) ethnicity, gender and survey batch; (M2) adding SES, rural background, Intermediate/FSc percentage and English capital; (M3) adding academic resources, cultural capital, discrimination, inclusion and support. Standard errors are heteroskedasticity-consistent (HC3; MacKinnon and White, 1985). Intersectionality was tested by adding product terms between non-Punjabi status and SES, rural background, English capital, resources, discrimination and gender to M2. We include survey batch in all models because the two files differ markedly in composition (Section 4.2). Analyses used Python with SciPy and statsmodels (Seabold and Perktold, 2010). With 92 Punjabi and 56 non-Punjabi students, power is 80% to detect a standardised difference of d = 0.48; power for d = 0.30 is 42% and for d = 0.50 is 83%. The study can therefore rule out large, but not small, ethnic differences.

**Results**

**Sample**

Table 3 describes the 148 students with known ethnicity. Their mean age was 21.9 years (SD = 2.8); 80% were undergraduates, 73% lived in a hostel, 38% came from rural backgrounds and 47% reported household income below PKR 50,000 per month. By field of study (broad groups assigned from free-text department names), the largest groups were agriculture, food and veterinary sciences, computing and engineering, and biosciences. Ethnic groups differed in gender composition (permutation $\chi^2(3) = 10.23$, $p = .016$, Cramér's $V = .26$; women were 42% of Punjabi but 56–79% of the other groups) and rural background ($\chi^2(3) = 8.82$, $p = .031$, $V = .24$): 47% of Punjabi students came from rural backgrounds compared with 19% of Saraiki, 21% of Pashtun and 31% of other students. Groups did not differ in degree level, scholarship receipt, low household income or survey batch (all $p > .22$). The proportion of students with a valid CGPA did not differ by ethnic group ($p = .77$), so missing outcomes do not appear to be related to ethnicity.

**Two collection batches that differ in composition**

The two data files are not equivalent. Batch A was 92% male (66 of 72 students with binary gender)

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and batch B was 94% female (72 of 77). Mean CGPA was 3.21 (SD = 0.41) in batch A and 3.60 (SD = 0.31)

**Table 3: Characteristics of students with known ethnicity (n = 148), by ethnic group. "Other" combines Kashmiri, Baloch, Sindhi, Hindko and other groups.**

| | Punjabi | Saraiki | Pashtun | Other | Total |
|---|---|---|---|---|---|
| n | 92 | 26 | 14 | 16 | 148 |
| Age, mean (SD) | 21.9 (2.8) | 21.5 (3.0) | 21.2 (1.9) | 22.9 (3.3) | 21.9 (2.8) |
| Female, n (%) | 39 (42) | 14 (56) | 11 (79) | 11 (73) | 75 (51) |
| Survey batch B, n (%) | 41 (45) | 14 (54) | 9 (64) | 10 (62) | 74 (50) |
| Rural background, n (%) | 43 (47) | 5 (19) | 3 (21) | 5 (31) | 56 (38) |
| Hostel resident, n (%) | 70 (76) | 19 (73) | 7 (54) | 11 (69) | 107 (73) |
| Undergraduate (BS), n (%) | 74 (83) | 21 (81) | 9 (69) | 10 (67) | 114 (80) |
| Household income < PKR 50k, n (%) | 45 (49) | 12 (48) | 6 (46) | 6 (38) | 69 (47) |
| Father: no formal education, n (%) | 8 (9) | 2 (8) | 1 (7) | 4 (25) | 15 (10) |
| Receives scholarship/aid, n (%) | 39 (43) | 12 (48) | 7 (50) | 3 (19) | 61 (42) |

In batch B, a difference of 0.39 grade points (95% CI 0.27 to 0.51). Women's mean CGPA exceeded men's by 0.30 (95% CI 0.18 to 0.43), but gender and batch are almost collinear (r = .85) and the data cannot separate them: once batch is in the model, the gender coefficient is small and not significant (Table 6). Perceived discrimination was also higher in batch A (2.87 versus 2.44). Survey batch is therefore included as a covariate throughout and its coefficient should be read as "batch and everything confounded with it, including gender", not as a gender effect.

**RQ1: Ethnicity and academic performance**

Mean CGPA was virtually identical across groups (Table 4; Figure 1): Punjabi 3.42 (SD = 0.43), Saraiki
3.44 (0.35), Pashtun 3.42 (0.42) and Other 3.33 (0.46); Welch F = 0.22, p = .885, $\eta^2$ = .005. Punjabi
students (3.42) and all other students (3.40) did not differ (difference −0.02, 95% CI −0.16 to 0.12,
d = −0.05, 95% CI −0.38 to 0.29, p = .783; Mann–Whitney p = .64; Table 13). The confidence
interval rules out differences larger than about 0.16 grade points, around 0.4 standard deviations of CGPA. Recent-semester GPA gave the same picture (Table 10).

The one group difference of note concerned prior attainment: non-Punjabi students reported higher Intermediate/FSc percentages (81.2% versus 77.1%; difference 4.0 points, 95% CI 1.1 to 7.0, d = 0.43, unadjusted p = .008), but this did not survive Holm adjustment across the 14 comparisons (p = .117) and should be treated as a hypothesis. Non-Punjabi students also lived somewhat farther from home (342 versus 258 km, unadjusted p = .042; Holm p = .55).

**RQ2: Social stratification factors**

Ethnic groups did not differ significantly on the SES index, income, parental education, difficulty meeting expenses, academic resources, cultural capital, English-language capital, perceived discrimination, campus inclusion or social support (all Welch p > .12; Table 4; all $\eta^2$ ≤ .057). Differences between Punjabi and non-Punjabi students were small on every measure other than prior attainment and distance (Table 13).

Table 5 shows how these factors relate to CGPA. Pre-university attainment was the clearest correlate (r = .27, p < .001; batch-adjusted r = .26). SES,

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cultural capital, English capital, rural background and distance were unrelated to CGPA. Perceived discrimination (r = −.29) and social support (r = −.25) correlated negatively with CGPA, but much of this reflects batch, since batch A had lower CGPA and higher reported discrimination. After adjusting for batch the associations weakened to r = −.20 (p = .012) for discrimination and −.16 for social support. The raw associations of CGPA with household income

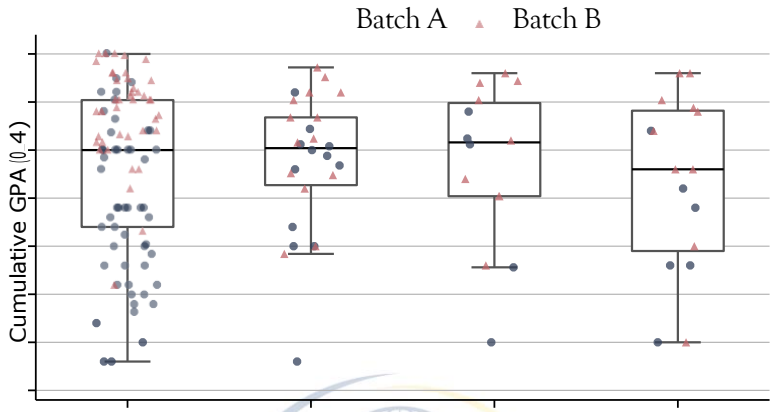



**Figure 1: Cumulative GPA by ethnic group. Boxes show the median and interquartile range; points are individual students coloured and shaped by survey batch.**

Punjabi (n = 92), Saraiki (n = 26), Pashtun (n = 14), Other (n = 16)

**Table 4: Means (SD) of CGPA and social factors by ethnic group, with Welch's one-way ANOVA. Raw p-values; no comparison is significant after Holm adjustment across the 14 variables (smallest adjusted p = .79).**

| Variable | Punjabi | Saraiki | Pashtun | Other | Welch F | p | $\eta^2$ |
|---|---|---|---|---|---|---|---|
| CGPA (0–4) | 3.42 (0.43) | 3.44 (0.35) | 3.42 (0.42) | 3.33 (0.46) | 0.22 | .885 | 0.005 |
| Intermediate/FSc (%) | 77.1 (10.1) | 82.2 (7.3) | 80.5 (7.5) | 80.0 (9.2) | 2.78 | .056 | 0.046 |
| SES index (z) | −0.02 (0.77) | −0.03 (0.76) | 0.19 (0.69) | −0.09 (0.87) | 0.40 | .751 | 0.008 |
| Household income (1–5) | 1.99 (1.19) | 2.00 (1.19) | 2.23 (1.30) | 2.44 (1.46) | 0.53 | .664 | 0.015 |
| Father's education (0–6) | 3.16 (1.61) | 3.58 (1.79) | 3.36 (1.34) | 3.00 (2.16) | 0.44 | .723 | 0.011 |
| Mother's education (0–6) | 2.67 (1.89) | 2.28 (2.13) | 3.36 (1.65) | 2.07 (2.02) | 1.48 | .239 | 0.028 |
| Difficulty meeting expenses (1–5) | 2.47 (1.27) | 2.17 (1.20) | 2.71 (1.14) | 2.81 (1.11) | 1.17 | .333 | 0.023 |
| Distance from home (km) | 258 (181) | 387 (253) | 256 (152) | 333 (329) | 2.08 | .123 | 0.057 |
| Academic resources (1–5) | 3.06 (0.78) | 3.09 (0.71) | 2.96 (0.37) | 3.10 (0.79) | 0.29 | .833 | 0.002 |

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| Cultural capital (1–5) | 3.31 (0.71) | 3.34 (0.66) | 3.37 (0.42) | 3.12 (0.83) | 0.39 | .758 | 0.009 |
| English/linguistic capital (1–5) | 3.36 (0.64) | 3.43 (0.70) | 3.51 (0.62) | 3.41 (0.84) | 0.25 | .862 | 0.005 |
| Perceived discrimination (1–5) | 2.70 (0.82) | 2.53 (1.14) | 2.56 (0.88) | 2.63 (0.91) | 0.25 | .859 | 0.007 |
| Campus inclusion (1–5) | 3.41 (0.68) | 3.38 (0.62) | 3.33 (0.45) | 3.30 (0.61) | 0.20 | .893 | 0.004 |
| Social support (1–5) | 3.33 (0.65) | 3.47 (0.71) | 3.29 (0.58) | 3.34 (0.86) | 0.30 | .826 | 0.006 |

(r = −.18) and with difficulty meeting expenses (r = .22) lost significance after batch adjustment (−.14 and .12), and so are likely artefacts of batch.

**RQ3: Do ethnicity and stratification intertwine?**
Table 6 reports the hierarchical models (n = 135). Ethnic-group coefficients were small and non-significant in every model and the three ethnicity terms were jointly non-significant (M1 F = 0.36, p = .78; M2 p = .55; M3 p = .67). Adding SES, rural background, prior attainment and English capital (M2) raised $R^2$ from .27 to .32 ($F(4,125) = 2.16$, p = .077), and adding the remaining social factors (M3) raised it to
.38 ($F(5, 120) = 2.28$, p = .051). In the full model the significant predictors were survey batch (b = 0.52, 95% CI 0.32 to 0.73) and Intermediate/FSc percentage (0.009 grade points per percentage point, 95% CI 0.001 to 0.017; a standard deviation more prior attainment predicts 0.09 more CGPA). Perceived discrimination was borderline (0.07 lower CGPA per scale point, 95% CI −0.14 to 0.005, p = .068). The
adjusted difference between non-Punjabi and Punjabi students was −0.08 (95% CI −0.22 to 0.06) in the
full model, again consistent with no effect (Table 10). Multicollinearity was acceptable for all predictors except the near-collinear pair of gender and batch (variance inflation factors 4.3 and 4.1; all others ≤ 2.8). Figure 2 summarises the full model.

**Table 5: Correlations of CGPA with student characteristics: pooled Pearson r, partial r controlling for survey batch, and within-batch r. Asterisks mark the significance of each coefficient: *p <.05, **p <.01, ***p <.001.**

| Variable | n | Pooled r | Batch-adjusted r | Batch A r | Batch B r |
|---|---|---|---|---|---|
| Intermediate/FSc (%) | 148 | 0.27*** | 0.26** | 0.21 | 0.32** |
| SES index | 147 | 0.04 | −0.03 | 0.01 | −0.09 |
| Household income | 150 | −0.18* | −0.14 | −0.07 | −0.25* |
| Difficulty meeting expenses | 148 | 0.22** | 0.12 | 0.21 | 0.02 |
| Academic resources | 150 | −0.13 | −0.09 | −0.15 | 0.00 |
| Cultural capital | 152 | 0.00 | 0.03 | 0.08 | −0.04 |
| English/linguistic capital | 152 | −0.05 | −0.04 | −0.02 | −0.07 |
| Perceived discrimination | 152 | −0.29*** | −0.20* | −0.25* | −0.14 |
| Campus inclusion | 151 | −0.03 | −0.07 | −0.22 | 0.12 |
| Social support | 152 | −0.25** | −0.16* | −0.14 | −0.19 |
| Rural background | 151 | −0.09 | −0.03 | 0.02 | −0.10 |
| Distance from home (km) | 142 | −0.09 | 0.04 | 0.15 | −0.17 |

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|---|---|---|---|---|---|
| Age | 139 | −0.27** | −0.15 | −0.23 | 0.02 |

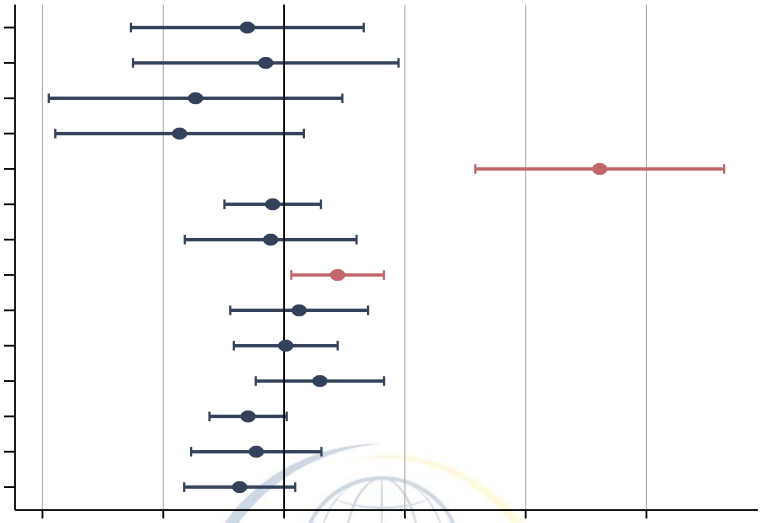



**Figure 2: Full model (M3) coefficients with 95% confidence intervals. Continuous predictors are standardised (per +1 SD); ethnicity, gender, batch and rural background are binary. Red marks p < .05.**

**Interactions.** None of the interactions between non-Punjabi status and SES, rural background, English capital, resources or perceived discrimination was significant (Table 7). The interaction with gender (b = −0.26, p = .055) is suggestive but, given six tests and the confounding of gender with batch, cannot be interpreted. Descriptive CGPA means by ethnicity and each stratification factor (Table 8) show gaps of at most 0.10 in either direction. In particular, there is no sign that the combination of minority ethnicity with low SES, rural origin or limited English is especially disadvantageous. The comparison is underpowered, however: only 13 non-Punjabi students were from rural backgrounds.

**Exploratory: heterogeneity by survey batch.** The overall null result conceals a difference between batches (Figure 3). In batch A, non-Punjabi and Punjabi students had the same CGPA (3.23 versus 3.20, difference +0.03, 95% CI −0.18 to 0.24, p = .78). In batch B, non-Punjabi students scored lower (3.52 versus 3.69; −0.17, 95% CI −0.32 to −0.03, p = .021; adjusted −0.23, 95% CI −0.40 to −0.05, p = .010). The formal test of the batch difference in the ethnic gap was not significant (interaction −0.25, 95% CI −0.51 to 0.02, p = .066; adjusted p = .093). This pattern was not hypothesised, rests on 33

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**Table 6: Hierarchical regressions of CGPA on ethnicity and social factors. Unstandardised coefficients b with HC3 robust standard errors in parentheses. *p < .05, **p < .01, ***p < .001.**

| | M1 | M2 | M3 |
|---|---|---|---|
| Intercept | 3.236*** (0.055) | 2.460*** (0.365) | 2.923*** (0.435) |
| Saraiki (vs Punjabi) | −0.011 (0.087) | −0.075 (0.090) | −0.061 (0.098) |
| Pashtun (vs Punjabi) | 0.032 (0.118) | −0.001 (0.118) | −0.030 (0.112) |
| Other ethnicity (vs Punjabi) | −0.121 (0.125) | −0.157 (0.120) | −0.147 (0.124) |
| Female | −0.185 (0.105) | −0.191 (0.102) | −0.173 (0.105) |
| Survey batch B | 0.582*** (0.107) | 0.576*** (0.102) | 0.523*** (0.105) |
| SES index | | −0.023 (0.051) | −0.025 (0.054) |
| Rural background | | −0.038 (0.071) | −0.022 (0.073) |
| Intermediate/FSc (%) | | 0.010* (0.004) | 0.009* (0.004) |
| English/linguistic capital | | 0.013 (0.054) | 0.037 (0.087) |
| Academic resources | | | 0.004 (0.059) |
| Cultural capital | | | 0.085 (0.077) |
| Perceived discrimination | | | −0.067 (0.037) |
| Campus inclusion | | | −0.073 (0.087) |
| Social support | | | −0.109 (0.070) |
| $R^2$ | 0.271 | 0.318 | 0.377 |
| Adjusted $R^2$ | 0.242 | 0.269 | 0.304 |
| n | 135 | 135 | 135 |

**Table 7: Interactions between non-Punjabi status ("Minority") and stratification variables, added one at a time to M2 (continuous variables mean-centred). b is the extra CGPA difference associated with a one-unit change.**

| Term | b (SE) | 95% CI | p |
|---|---|---|---|
| Minority × SES index | 0.065 (0.105) | [−0.140, 0.271] | .533 |
| Minority × Rural background | 0.131 (0.149) | [−0.160, 0.423] | .377 |
| Minority × English/linguistic capital | 0.089 (0.108) | [−0.123, 0.302] | .409 |
| Minority × Academic resources | 0.125 (0.112) | [−0.094, 0.343] | .265 |
| Minority × Perceived discrimination | 0.103 (0.069) | [−0.032, 0.238] | .136 |
| Minority × Female | −0.260 (0.135) | [−0.524, 0.005] | .055 |

non-Punjabi students in batch B, and arises from one of several subgroup looks; it could reflect chance, gender, department mix or other differences between batches. We report it so that it can be examined in a larger, balanced sample, not as evidence of a gap.

**RQ4: Discrimination, inclusion and support**

Perceived ethnic discrimination was common (Table 11; Figure 4). The mean score was 2.65 (SD = 0.88) on the 1–5 scale; 91% of students reported at least one of the 12 experiences "sometimes" or more often, and 39% had a scale mean of at least 3. The most commonly endorsed experiences were witnessing another student treated unfairly (71% sometimes or more often), unfair grading or feedback believed to be related to ethnicity (62%), avoiding people or activities in anticipation of prejudice (60%), and perceived teacher favouritism (59%); being treated with less respect

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by another student was least common (31%). Perceived discrimination did not differ by ethnic group (Table 4; p = .86), and Punjabi students endorsed the items about as often as others. No item differed significantly after Holm adjustment (smallest raw p = .072, for being mocked about accent or mother tongue, reported by 54% of Punjabi versus 45% of other students).

Perceptions of the campus climate were moderately positive (mean inclusion 3.37 on the 1–5 scale).

**Table 8: Mean CGPA (SD), n by ethnicity and stratification factors (median splits for SES and English capital).**

| | Punjabi | Non-Punjabi | Difference |
|---|---|---|---|
| Urban | 3.49 (0.44), 49 | 3.39 (0.41), 43 | −0.10 |
| Rural | 3.34 (0.41), 43 | 3.44 (0.36), 13 | 0.09 |
| Higher SES (above median) | 3.38 (0.45), 45 | 3.42 (0.39), 25 | 0.04 |
| Lower SES (below median) | 3.46 (0.41), 46 | 3.36 (0.43), 27 | −0.10 |
| Higher English capital | 3.42 (0.44), 44 | 3.46 (0.34), 31 | 0.04 |
| Lower English capital | 3.42 (0.42), 48 | 3.33 (0.46), 25 | −0.10 |

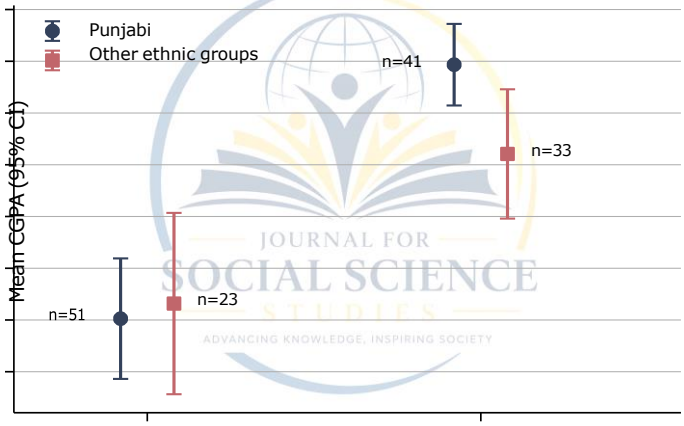



**Figure 3: Mean CGPA of Punjabi and other students within each survey batch (95% confidence intervals).**

Batch A (mostly male)
Batch B (mostly female)

About half agreed that they belong at PMAS-AAUR (50%), that it is safe to express their identity (53%) and that their background is valued (52%), and 61% agreed that groups have equal opportunities. Weaker were the institutional items: 47% agreed that the university listens to concerns about inclusion, 43% that rules adequately address discrimination, and only 39% knew where to report discrimination or unfair treatment (Table 12).

Table 9 shows predictors of discrimination and inclusion (n = 140). Perceived discrimination was lower in batch B (b = −0.55, p = .008) and unrelated to ethnicity (joint test p = .96), SES, rural background or English capital. Inclusion was strongly related to English-language capital (b = 0.49 per scale point, p < .001; model $R^2$ = .30). Ethnicity as a whole showed no significant relationship with inclusion (joint p = .077), although Pashtun students reported lower inclusion than Punjabi students (b = −0.29, p = .009; n = 14 Pashtun students). We treat this as exploratory

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**Table 9: Regressions of perceived discrimination and campus inclusion on ethnicity and background (HC3 standard errors). *p < .05, **p < .01, ***p < .001.**

| | Perceived discrimination | Campus inclusion |
|---|---|---|
| Saraiki (vs Punjabi) | −0.136 (0.262) | −0.130 (0.136) |
| Pashtun (vs Punjabi) | 0.014 (0.262) | −0.292** (0.112) |
| Other ethnicity (vs Punjabi) | 0.014 (0.282) | −0.158 (0.131) |
| Female | 0.173 (0.230) | 0.187 (0.141) |
| Survey batch B | −0.548** (0.207) | −0.007 (0.133) |
| SES index | −0.170 (0.104) | 0.015 (0.068) |
| Rural background | −0.175 (0.163) | 0.016 (0.106) |
| English/linguistic capital | −0.035 (0.125) | 0.494*** (0.104) |
| $R^2$ | 0.089 | 0.296 |
| n | 140 | 140 |

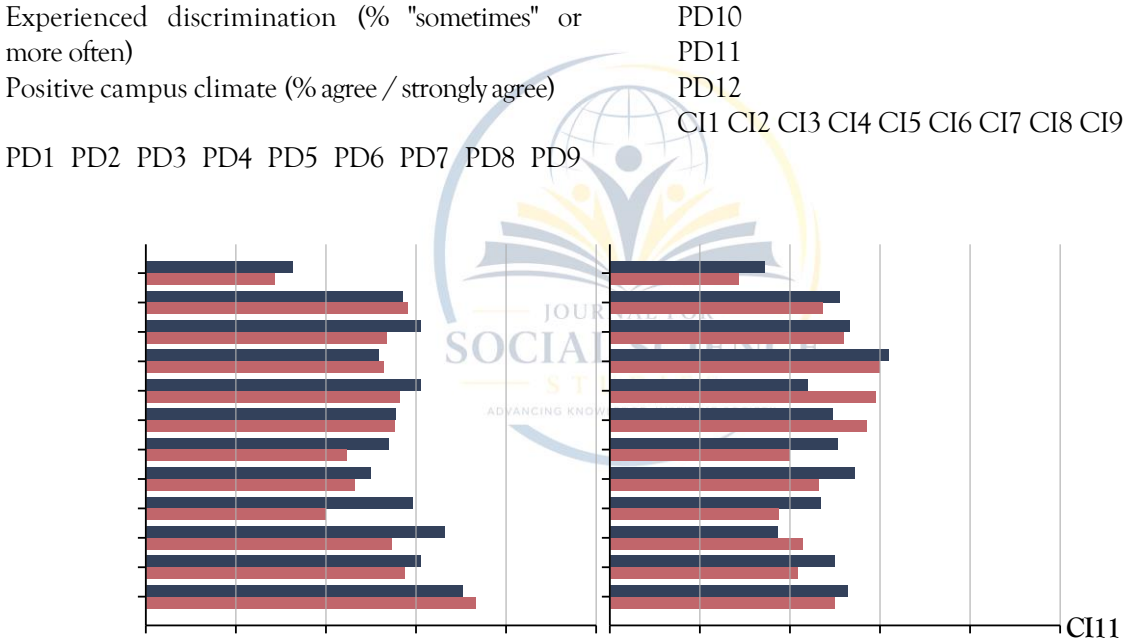



**Figure 4: Percentage of Punjabi and non-Punjabi students reporting each experience of discrimination "sometimes" or more often (left) and agreeing with each inclusion statement (right). Item wording in Appendix Tables 11 and 12.**

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**Robustness**

Table 10 shows that the Punjabi–non-Punjabi comparison is stable across specifications: across all pooled specifications the estimated difference lies between −0.08 and +0.07 grade points and none is significant; the only significant estimates are those restricted to batch B.

**Table 10: Difference in CGPA between non-Punjabi and Punjabi students under alternative specifications (unstandardised, with 95% CI).**

| Analysis | n | Difference [95% CI] | p |
|---|---|---|---|
| Primary: unadjusted difference (non-Punjabi − Punjabi) | 148 | −0.02 [−0.16, 0.12] | .783 |
| Adjusted for gender and survey batch | 135 | −0.03 [−0.16, 0.10] | .625 |
| Adjusted for gender, batch, SES, rural, FSc, English capital | 135 | −0.08 [−0.22, 0.05] | .223 |
| Fully adjusted (adds resources, cultural capital, discrimination, inclusion, support) | 135 | −0.08 [−0.22, 0.06] | .282 |
| Fully adjusted, original instrument scoring of R9, R10, LC9, LC10 | 135 | −0.08 [−0.22, 0.07] | .307 |
| Retaining under-18 respondents | 150 | −0.02 [−0.15, 0.12] | .799 |
| Retaining duplicate and copied-response records | 157 | −0.03 [−0.16, 0.10] | .687 |
| Outcome: most recent semester GPA | 146 | 0.07 [−0.08, 0.22] | .335 |
| Excluding first-semester students | 128 | −0.01 [−0.16, 0.14] | .886 |
| Batch A only | 74 | 0.03 [−0.18, 0.24] | .777 |
| Batch B only | 74 | −0.17 [−0.32, −0.03] | .021 |
| Batch B only, adjusted (SES, rural, FSc, English capital) | 65 | −0.23 [−0.40, −0.05] | .010 |

**Discussion**

**No detectable ethnic gap in CGPA.** The central finding is negative: CGPA at PMAS-AAUR did not differ between Punjabi students and students from other ethnic groups, in raw or adjusted comparisons, and the confidence interval excludes gaps larger than about 0.16 grade points. This contrasts with the expectation derived from UK and Brazilian studies and from accounts of ethnic stratification in Pakistan (Brophy, 2025; Betarelli et al., 2025; Aslam et al., 2022), but it is consistent with the UK finding that ethnic differences interact little with other disadvantages (Brophy, 2025). Several explanations are possible and cannot be separated with these data. Students who have reached university may be a selected group: non-Punjabi students reported higher Intermediate/FSc marks, which would fit positive selection (a higher bar for entry), although that difference did not survive multiplicity correction. The university's catchment may be relatively homogeneous in resources; ethnic groups here did not differ in SES, resources or cultural and linguistic capital. And with 56 non-Punjabi students our power for small differences is limited.

**Stratification is not organised by ethnicity in this sample.** Contrary to the view that minority students are disproportionately poor or rural, Punjabi students were the more rural group, and ethnic groups were similar in income and parental education. SES, rural background, cultural capital and English capital were also unrelated to CGPA. The factor that did predict performance was prior attainment, which suggests that, at this university, differences in grades follow earlier academic trajectories more than ethnicity or measured social background. The stratification measures were brief self-reports and may capture class position imperfectly.

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**Perceived discrimination is widespread, equally across groups, and related to lower performance.** More than nine in ten students reported at least one discriminatory experience at least "sometimes", and Punjabi students reported the same levels as others. Two readings are plausible. The items may capture a broader sense of unfair treatment (by region, language, accent, department or personal connections) than ethnicity as classified here, particularly since "Punjabi" is itself a heterogeneous category. Or perceived discrimination may be general at the institution. Interview data from the planned qualitative strand should help decide. Higher perceived discrimination was associated with lower CGPA (batch-adjusted r = −.20), and the coefficient remained borderline after full adjustment (p = .068). The direction of this relationship cannot be determined here: unfair treatment may depress performance, or students with poorer grades may be more inclined to attribute them to unfair treatment.

**English-language capital and belonging.** English-language capital was unrelated to CGPA but was the strongest correlate of campus inclusion (b = 0.49). Students who are comfortable with English-medium instruction feel more included, in line with qualitative work on how English competence shapes participation and confidence in Pakistani universities (Muhammad, 2022; Amin, 2015). As both measures are self-reported on the same questionnaire, some of this association may reflect shared response style. The institutional-climate items also deserve attention: fewer than half of students felt the university listens or that rules address discrimination adequately, and only 39% knew where to report it.

**Intersectionality.** We found no evidence that ethnicity interacts with SES, rural background or language capital. This echoes the limited support reported by Brophy (2025), but our interaction tests had limited power and the exploratory batch-specific gap and the suggestive ethnicity-by-gender interaction (p = .055) leave the question open, particularly for female students.

**Implications for PMAS-AAUR.** The results do not indicate a need to target support by ethnic group on the basis of grades alone. They do suggest that (i) pathways for reporting unfair treatment should be made visible and trusted, given low awareness of reporting mechanisms; (ii) English academic-literacy
support may promote belonging; and (iii) the university should monitor outcomes by ethnicity with verified records, since self-reported data cannot settle the question.

**Limitations**

1. **Collection and sampling.** Two non-equivalent batches, with nearly complete overlap between batch and gender, limit what can be said about gender and complicate pooling. The sampling procedure and response rate are not documented in the data, so generalisation to the university is uncertain. The 193 returned questionnaires fall short of the 250–300 planned.
2. **Data quality.** The raw files contained duplicates, apparently copied responses, ambiguous multi-answer cells and non-standard GPA entries. We handled them with explicit rules and showed that results are unchanged by the main choices, but errors may remain.
3. **Measurement.** CGPA was self-reported and unverified. Four negatively worded items had to be dropped. The discrimination scale does not distinguish ethnic from other grounds of unfair treatment. Ethnicity was self-identified and several groups were pooled because of small numbers.
4. **Power and multiplicity.** Small minority groups give low power for small effects and for interactions; exploratory findings (batch-specific gap, prior attainment, Pashtun inclusion) should not be over-interpreted.
5. **Design.** The cross-sectional design precludes causal inference. The qualitative strand, which is needed to explain mechanisms, is not reported here.

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**Conclusion**

In a survey of students at PMAS-AAUR we found no evidence of a sizeable ethnic gap in cumulative GPA, no ethnic differences in SES, academic resources or cultural and linguistic capital, and no evidence that ethnicity interacts with social disadvantage in shaping grades. Prior attainment was the clearest predictor of performance. Perceptions of unfair treatment were common, shared across ethnic groups and associated with lower grades, and English-language capital was strongly linked to feeling included. Future work should use balanced samples with verified GPA records, larger minority samples and the planned interviews, to understand what students mean by ethnic discrimination at the university and how language and inclusion shape their experience.

**Disclosure statement**

There are no competing interests to declare.

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**Ethics**

Ethical form is attached.

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### A Instrument and item wording

The questionnaire comprised nine sections (demographics; SES; academic resources; cultural capital; linguistic capital; perceived ethnic discrimination; campus inclusion; social support; academic performance). Tables 11 and 12 give the discrimination and inclusion items (abbreviated) with descriptives.

**Table 11: Perceived ethnic discrimination items. % ≥ 3 = "sometimes" or more often, overall and by group. p: Mann–Whitney, Punjabi vs. others (unadjusted; no item survives Holm adjustment).**

| | Item (abbreviated) | Mean (SD) | % all | % Punjabi | % others | p |
|---|---|---|---|---|---|---|
| PD1 | Treated with less respect by another student | 2.09 (1.21) | 31 | 33 | 29 | .539 |
| PD2 | Heard negative comments/jokes/stereotypes | 2.69 (1.28) | 58 | 57 | 58 | .834 |
| PD3 | Excluded from discussion or group | 2.75 (1.39) | 58 | 61 | 54 | .142 |
| PD4 | Stereotyped/judged (language, dress, accent, region) | 2.53 (1.21) | 52 | 52 | 53 | .758 |
| PD5 | Teacher favoured another student | 2.83 (1.28) | 59 | 61 | 56 | .326 |
| PD6 | Less comfortable approaching a teacher | 2.66 (1.32) | 55 | 55 | 55 | .884 |
| PD7 | Mocked for accent/mother tongue | 2.51 (1.36) | 50 | 54 | 45 | .072 |
| PD8 | Made to feel background is inferior | 2.47 (1.19) | 49 | 50 | 46 | .672 |
| PD9 | Ethnicity harmed my academic opportunities | 2.61 (1.36) | 52 | 59 | 40 | .076 |
| PD10 | Unfair grading/feedback linked to ethnicity | 2.88 (1.32) | 62 | 66 | 55 | .642 |
| PD11 | Avoided people/activities expecting prejudice | 2.75 (1.28) | 60 | 61 | 57 | .385 |

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|---|---|---|---|---|---|---|
| PD12 | Witnessed another student treated unfairly | 3.01 (1.22) | 71 | 70 | 73 | .528 |

**Table 12: Campus inclusion items. % = agree or strongly agree (4–5), overall and by group. p: Mann–Whitney, Punjabi vs. others (unadjusted; no item survives Holm adjustment).**

| | Item (abbreviated) | Mean (SD) | % all | % Punjabi | % others | p |
|---|---|---|---|---|---|---|
| CI1 | Different groups treated with respect | 2.92 (1.24) | 32 | 34 | 29 | .245 |
| CI2 | I belong at PMAS-AAUR | 3.47 (1.17) | 50 | 51 | 47 | .351 |
| CI3 | Safe to express my identity | 3.49 (1.10) | 53 | 53 | 52 | .675 |
| CI4 | Equal opportunities across groups | 3.66 (1.04) | 61 | 62 | 60 | .710 |
| CI5 | Teachers fair regardless of ethnicity | 3.48 (1.09) | 50 | 44 | 59 | .042 |
| CI6 | Comfortable working with other groups | 3.41 (1.12) | 52 | 49 | 57 | .412 |
| CI7 | Students respect languages/accents | 3.40 (1.09) | 47 | 51 | 40 | .139 |
| CI8 | University enables minority success | 3.49 (1.05) | 51 | 54 | 46 | .336 |
| CI9 | Rules address discrimination adequately | 3.24 (1.10) | 43 | 47 | 38 | .104 |
| CI10 | I know where to report discrimination | 3.18 (1.17) | 39 | 37 | 43 | .841 |
| CI11 | University listens to concerns | 3.35 (1.13) | 47 | 50 | 42 | .502 |
| CI12 | My background is valued diversity | 3.53 (0.99) | 52 | 53 | 50 | .274 |

**Table 13: Punjabi versus non-Punjabi students on CGPA and social factors, with Welch t-tests (difference = non-Punjabi − Punjabi). p: raw; $p_{Holm}$: adjusted across 14 comparisons.**

| Variable | Punjabi | Non-Punj. | Difference [95% CI] | d | p | pHolm |
|---|---|---|---|---|---|---|
| CGPA (0–4) | 3.42 | 3.40 | −0.02 [−0.16, 0.12] | −0.05 | .783 | 1.000 |
| Intermediate/FSc (%) | 77.1 | 81.2 | 4.02 [1.05, 6.99] | 0.43 | .008 | .117 |
| SES index (z) | -0.02 | 0.01 | 0.03 [−0.23, 0.30] | 0.04 | .822 | 1.000 |
| Household income (1–5) | 1.99 | 2.19 | 0.20 [−0.23, 0.62] | 0.16 | .364 | 1.000 |
| Father's education (0–6) | 3.16 | 3.35 | 0.19 [−0.40, 0.78] | 0.11 | .530 | 1.000 |
| Mother's education (0–6) | 2.67 | 2.50 | −0.17 [−0.84, 0.50] | −0.09 | .608 | 1.000 |
| Difficulty meeting expenses (1–5) | 2.47 | 2.50 | 0.03 [−0.38, 0.45] | 0.03 | .874 | 1.000 |
| Distance from home (km) | 258 | 342 | 83.84 [3.01, 164.66] | 0.39 | .042 | .549 |
| Academic resources (1–5) | 3.06 | 3.06 | 0.00 [−0.24, 0.23] | −0.01 | .973 | 1.000 |
| Cultural capital (1–5) | 3.31 | 3.28 | −0.02 [−0.25, 0.20] | −0.03 | .835 | 1.000 |
| English/linguistic capital (1–5) | 3.36 | 3.44 | 0.08 [−0.15, 0.31] | 0.12 | .485 | 1.000 |
| Perceived discrimination (1–5) | 2.70 | 2.56 | −0.14 [−0.45, 0.18] | −0.15 | .389 | 1.000 |
| Campus inclusion (1–5) | 3.41 | 3.34 | −0.07 [−0.28, 0.14] | −0.11 | .514 | 1.000 |

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|---|---|---|---|---|---|---|
| Social support (1–5) | 3.33 | 3.38 | 0.05 [−0.18, 0.29] | 0.08 | .660 | 1.000 |

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