

**Supplemental Material for “Bridging Borders with an Intersectional Approach:
Intimate Partner Violence Experiences among Bisexual Women in Brazil and
Italy”**

Descriptive Sociodemographic Comparisons by Intimate Partner Violence

This supplementary material presents stratified sociodemographic descriptives by intimate partner violence (IPV) experience according to Country, wage, race/ethnicity and age. In the sample (N = 2,521), 2,054 participants (81.5%) were classified as having reported IPV, whereas 467 participants (18.5%) were classified as not having reported IPV (Table S1). This imbalance indicates a high burden of self-reported IPV within the sample and provides the base rate context for interpreting both descriptive comparisons and subsequent intersectional modelling. The descriptive comparisons are used to characterize the composition of the sample and to facilitate transparent interpretation of group distributions prior to the intersectional modelling stages. This material summarizes group differences using complementary descriptive tests and effect sizes, Cohen’s d for age and chi-square tests with Cramér’s V for categorical variables.

Table S1. *Overall Distribution of IPV*

IPV	n	%
No IPV reported	467	18.5
IPV reported	2,054	81.5

Note. Percentages are calculated over the total analytic sample (N = 2,521).

Age distributions were highly similar across IPV groups (Table S2). Participants who reported IPV had a mean age of 26.50 years (SD = 5.19; median = 26; IQR = 5), while those who did not report IPV had a mean age of 26.74 years (SD = 5.57; median = 26; IQR = 5). The standardized mean difference was negligible (Cohen’s d = 0.046), suggesting minimal separation between groups in terms of age.

Table S2. *Age Descriptives by IPV*

Group	n	M	SD	Median	IQR	Min–Max
IPV reported	2053	26.50	5.19	26	5	18–88
No IPV reported	467	26.74	5.57	26	5	18–59

Note. Age is summarized using n, mean (M), standard deviation (SD), median and interquartile range (IQR).

For categorical sociodemographic variables, group distributions are presented as within-group percentages and complemented by chi-square tests with Cramér's V effect sizes. For Country, Brazilian participants represented 83.4% of the IPV-reported group, but 63% of the non-IPV group, whereas category Italian participants represented 16.6% and 37%, respectively, indicating a substantial shift in group composition (Table S3). This pattern was reflected in a statistically detectable association ($p < .001$) with a moderate effect size (Cramér's $V = .197$) (Table S4). Minority represented 57.9% of the IPV-reported group and 42.8% of the non-IPV group, while level non-minority represented 26.2% of the IPV-reported group and 20.6% of the non-IPV group (Table S3), corresponding to a statistically detectable association ($p = .011$) but a small effect size (Cramér's $V = .050$) (Table S4). For wage, category 1 represented 62.0% of the IPV-reported group and 67.9% of the non-IPV group (with category 0 representing 38.0% and 32.1%, respectively) (Table S3). Although the chi-square test was statistically detectable ($p = .017$), the effect size was small (Cramér's $V = .048$) (Table S4), indicating limited practical separation between IPV groups on this variable. Age category results converged with the continuous-age findings. The distribution of Age_Cat was nearly identical across groups: 18–24 accounted for 34.4% of the IPV-reported group and 35.1% of the non-IPV group, while 25 plus accounted for 65.5% and 64.9%, respectively (Table S3). The chi-square test was non-significant ($p = .786$) with a trivial effect size (Cramér's $V = .005$) (Table S4), reinforcing the conclusion that age composition, as operationalized here, does not meaningfully differ by IPV within this analytic sample.

Table S3. *Sociodemographic Characteristics by IPV*

Variable	Level	IPV reported	No IPV reported
Country	Brazil	1713 (83.4%)	294 (62.96%)
Country	Italy	341 (16.6%)	173 (37.04%)
Wage	Lower	781 (38.02%)	150 (32.12%)
Wage	Upper	1273 (61.98%)	317 (67.88%)
Race/Ethnicity	Minority	1516 (73.81%)	371 (79.44%)
Race/Ethnicity	Non-Minority	538 (26.19%)	96 (20.56%)
Age_Cat	18-24	707 (34.42%)	164 (35.12%)
Age_Cat	25 plus	1342 (65.58%)	303 (64.88%)

Note. Cells report n (within-group %).

Table S4. *Categorical Association Tests by IPV Status*

Variable	Test	p	Effect size	Value
Country	Chi-square	< .001	Cramer's V	.197
Wage	Chi-square	= .017	Cramer's V	.048
Race/Ethnicity	Chi-square	= .011	Cramer's V	.050
Age_Cat	Chi-square	= .786	Cramer's V	.005

Note. Tests are chi-square comparisons of IPV status by each categorical sociodemographic variable. Effect size is Cramer's V.

Taken together, the supplementary descriptives indicate that the high IPV burden observed in this analytic sample is broadly distributed rather than confined to a single sociodemographic profile. Across age indicators, the IPV-reported and non-IPV groups were essentially comparable, with a negligible standardized mean difference for continuous age and a near-identical distribution for the derived age categories, suggesting that age composition is unlikely to be a primary driver of group differentiation in this dataset. Overall, these results provide an empirical baseline for the subsequent MAIHDA modelling by clarifying which sociodemographic axes show clearer descriptive separation by IPV status and which appear comparatively stable across groups.

Sensitivity analysis excluding the race/ethnicity axis from the strata definition, and age-focused robustness checks

This supplementary material documents additional robustness checks designed to address two measurement and sampling concerns that can arise in intercategorical intersectional analyses. After running the MAIHD model proposed on the present study, additional analysis was conducted to assess if sample bias associated with race/ethnicity and age sample were undermining the studies results.

First, race/ethnicity categories are socially constructed and context-specific, and the Brazilian IBGE categories and the Italian self-identification as belonging to a socially marginalised group are not psychometrically equivalent. To examine whether the substantive MAIHDA pattern depends on this potentially non-equivalent axis, the analysis re-estimated the multilevel logistic MAIHDA models after removing the race/ethnicity axis from the strata definition.

Second, the sample showed a strong concentration of younger participants (Age: $M = 26.5$, $SD = 5.5$; range = 18–88). Because recruitment via social media can disproportionately reach younger respondents, this age distribution could inflate absolute prevalence levels. To evaluate whether this skew could meaningfully alter the study's substantive conclusions regarding intersectional disparities, the analysis conducted age-adjustment and age-restriction checks that treat age as an individual-level covariate rather than a stratifying axis.

Across all specifications, the same modelling logic was retained: a null model with a random intercept for strata (to quantify between-stratum heterogeneity) and an additive model including the relevant main effects (to evaluate whether between-stratum differences are predominantly additive or whether residual/intersectional effects remain). For each specification, the analysis reports the Variance Partition Coefficient (VPC) for the null and additive models, the Proportional Change in Variance (PCV) from the null to the additive model, standard fit indices (AIC, BIC, log-likelihood), and AUC values. Stratum-level predicted probabilities with 95% confidence intervals are reported to describe the intersectional gradient implied by each model.

Main model reference (as reported in the article)

The primary MAIHDA specification in the article defined 16 strata via the cross-classification of Country $\times$ Race/Ethnicity $\times$ Wage $\times$ Age category (18–24 vs 25+). Using the analytic sample available for model estimation ($N = 2,519$), the null model yielded $VPC = 0.0819$, indicating that approximately 8.2% of the total variance in IPV risk was attributable to between-stratum differences. After adding the main effects, the VPC decreased to 0.0120 and the between-stratum variance reduction corresponded to $PCV = 0.8648$, indicating that most between-stratum inequality was captured by additive effects rather than by residual/intersectional departures. Model fit improved from $AIC = 2342.6$ (null) to $AIC = 2336.5$ (additive), with AUC values of 0.6293 (null) and 0.6227 (additive).

Sensitivity analysis excluding the race/ethnicity axis from strata

In the race/ethnicity sensitivity specification, strata were redefined as Country $\times$ Wage $\times$ Age category (8 strata), excluding Race/Ethnicity from the strata definition. This model was estimated on the same analytic N as the main model ($N = 2,519$). The null model produced $VPC = 0.0950$, and the additive model reduced this to $VPC = 0.0120$, with $PCV = 0.8840$. Fit improved from $AIC = 2338.96$ (null) to $AIC = 2332.64$ (additive), while AUC values were similar across the two models (0.6220 vs 0.6206). Taken together, these metrics indicate that removing the race/ethnicity axis from the strata definition did not materially change the magnitude of between-stratum heterogeneity nor the conclusion that most between-stratum inequality is explained by additive main effects.

The stratum-level predicted probabilities in this race/ethnicity sensitivity model ranged from 63.44% to 86.58%. The highest predicted probability occurred in the Brazilian, lower-wage, 18–24 stratum (predicted = 86.58%, 95% CI [85.17, 87.82], $n = 793$). The lowest predicted probability occurred in the Italian, upper-wage, 25+ stratum (predicted = 63.44%, 95% CI [60.91, 66.04], $n = 4$). Confidence intervals widened sharply in the smallest strata, which is expected given limited information at that intersectional position and should be interpreted as imprecision rather than as evidence of instability in the broader pattern (Table S1).

Table S5. Stratum-level predicted probabilities of IPV (race/ethnicity sensitivity strata: Country $\times$ Wage $\times$ Age category)

Stratum	n_stratum	Predicted probability (%)	95% CI (lower)	95% CI (upper)
Italy_ Upper_18-24	131	58.86	47.76	69.43
Italy_ Lower_25 plus	253	66.55	56.97	75.48
Italy_ Lower_18-24	43	68.58	56.37	78.88
Italy_ Lower_25 plus	85	75.90	65.21	83.80
Brazil_ Upper_25 plus	794	84.65	78.97	88.96
Brazil_ Lower_25 plus	516	85.17	79.68	89.88
Brazil_ Upper_18-24	412	86.23	80.40	90.72
Brazil_ Lower_18-24	285	86.25	80.04	90.62

Note. Predicted probabilities are model-based estimates from the additive MAIHDA model re-specified without the race/ethnicity axis in the strata definition.

To evaluate whether removing Race/Ethnicity changes the gradients along axes shared with the main model, the analysis compared predicted probabilities aggregated by Country $\times$ Wage. The differences between the main model and the race/ethnicity sensitivity model were small across all four shared cells (absolute differences ≤ 0.55 percentage points), supporting the conclusion that the removal of Race/Ethnicity primarily changes how heterogeneity is *partitioned* across axes rather than changing the substantive ordering of risk across the shared country–income gradient (Table S2).

Table S6. Country $\times$ Wage comparison between the main MAIHDA model and the race/ethnicity sensitivity model

C	W	n	Main model	Main 95% CI ()	Main 95% CI ()	Race- sensitivity model (%)	Race- sensitivity 95% CI (lower)	Race- sensitivity 95% CI (upper)	Difference (sens – main)
			%	Lower	Upper				
B	L	801	85.68	85.63	85.73	85.57	85.54	85.60	-0.11
B	U	1,206	85.19	85.15	85.23	85.23	85.19	85.27	0.04
I	L	128	72.77	72.26	73.29	73.32	72.72	73.92	0.55
I	U	384	64.07	63.75	64.39	63.88	63.52	64.24	-0.19

Note. C = Country, B = Brazil, I = Italy, W = Wage, L = Lower, U = Upper, Cells report model-implied predicted probabilities aggregated over the Country × Wage combinations shared by both specifications.

Age-adjustment robustness check: age treated as a continuous covariate

To evaluate whether the age distribution could be driving the intersectional pattern, the analysis re-estimated MAIHDA models in which age was removed from the strata definition and instead entered as a continuous, mean-centred individual-level covariate. In this age-adjustment specification, strata were defined as Country × Race/Ethnicity × Wage (8 strata). Because this specification required complete data on the continuous age covariate, the analytic sample was N = 2,518.

In the linear age-adjustment model, the null model yielded VPC = 0.0597 and the additive model reduced this to VPC = 0.0048, with PCV = 0.9249. Fit improved slightly from AIC = 2338.67 (null) to AIC = 2337.42 (additive). AUC values were 0.6167 (null) and 0.6086 (additive). The stratum-level predicted probabilities ranged from 64.45% to 86.05%, closely matching the substantive spread observed in the main model and in the race/ethnicity sensitivity model. The highest predicted probability occurred in the Brazilian, minoritised, lower-wage stratum (predicted = 86.05%, 95% CI [84.82, 87.18], n = 625), and the lowest occurred in the Italian, non-minoritised, lower-wage stratum (predicted = 64.45%, 95% CI [62.17, 66.71], n = 79). This preserved country gradient is consistent with the article's overall interpretation that intersectional differences in IPV risk are structured strongly by country and income-related positioning (Table S3).

An additional non-linear specification tested a quadratic age term. The quadratic model did not improve fit relative to the linear age-adjustment model (AIC = 2339.35 for the quadratic specification versus 2337.42 for the linear specification), and the AUC values were not higher (0.6128 vs 0.6086). Given these results, the linear age-adjustment specification provides a parsimonious robustness check without evidence that a quadratic age term materially alters model performance in this dataset (Table 3).

Table S7. Stratum-level predicted probabilities of IPV for the age-adjustment strata (Country $\times$ Race/Ethnicity $\times$ Wage), linear age control

Stratum	n_stratum	Predicted probability (%)	95% CI (lower)	95% CI (upper)
Italy_Minority_Upper	375	64.19	55.48	72.27
Italy_Non-Minority_Upper	9	68.48	54.56	79.27
Italy_Non-Minority_Lower	8	71.73	56.77	83.46
Italy_Minority_Lower	121	72.65	62.92	80.79
Brazil_Non-Minority_Upper	301	84.23	78.46	88.49
Brazil_Minority_Lower	485	85.37	80.80	89.12
Brazil_Minority_Upper	905	85.41	80.74	88.94
Brazil_Non-Minority_Lower	316	86.10	80.77	90.16

Note. Predicted probabilities are model-based estimates from the additive MAIHDA model in which age was included as a continuous individual-level covariate (mean-centred), rather than as an axis defining strata.

Age-restriction robustness check: re-estimation in the Age $\geq$ 25 subsample

To test whether conclusions depend on the inclusion of the youngest respondents, the analysis re-estimated the age-adjustment specification in an age-restricted subsample excluding participants aged 18–24 (Age $\geq$ 25). This restriction reduced the analytic sample to N = 1,648. Strata were again defined as Country $\times$ Race/Ethnicity $\times$ Wage (8 strata), and age was included as a continuous, mean-centred covariate within this restricted range.

In the restricted sample, the null model yielded VPC = 0.0377. In the additive model, the stratum-level random-intercept variance reached the boundary (estimated as 0), producing VPC = 0 and PCV = 1.00. Fit showed a small improvement from AIC = 1550.39 (null) to AIC = 1549.87 (additive), with AUC values of 0.5919 (null) and 0.5815 (additive). The stratum-level predicted probabilities ranged from 64.70% to 86.54%, again preserving the core gradient: the Brazilian strata occupied the upper end of predicted risk (e.g., Brazilian, minoritised, lower-wage: 86.54%, 95% CI [84.56, 88.19], n = 441), whereas the lowest predicted probability remained within the Italian, non-minoritised, lower-wage stratum (64.70%, 95% CI [58.41, 70.37], n = 28). As in the race/ethnicity sensitivity analysis, confidence intervals expanded for the smallest strata (Table S4).

Table S8. Stratum-level predicted probabilities of IPV in the Age $\geq$ 25 subsample (Country $\times$ Race/Ethnicity $\times$ Wage)

Stratum	n_stratum	Predicted probability (%)	95% CI (lower)	95% CI (upper)
Italy $\times$ Minority $\times$ Upper	6	66.61	56.90	75.15
Italy $\times$ Minority $\times$ Lower	4	69.31	53.05	81.61
Italy $\times$ Non-Minority $\times$ Upper	247	69.53	63.63	74.73
Italy $\times$ Non-Minority $\times$ Lower	81	73.17	65.91	79.49
Brazil $\times$ Minority $\times$ Upper	220	82.29	77.62	86.42
Brazil $\times$ Non-Minority $\times$ Upper	574	84.20	80.86	86.95
Brazil $\times$ Minority $\times$ Lower	216	84.84	80.07	88.46
Brazil $\times$ Non-Minority $\times$ Lower	300	86.54	82.70	89.52

Note. Predicted probabilities are model-based estimates from the age-restricted (Age $\geq$ 25) MAIHDA specification.

Importantly, this age restriction check does not imply that age is irrelevant to IPV risk; rather, it shows that removing the youngest group does not materially change the ordering and magnitude of the intersectional gradient across country, income, and

minoritised positioning as represented in this dataset. In practical terms, the age distribution appears more consequential for the *level* of prevalence estimates than for the *structure* of disparities across intersectional positions.

Summary of complementary analysis

Across the race/ethnicity sensitivity specification, the age-adjustment models (linear and quadratic), and the age-restricted re-estimation, the same substantive pattern remained visible: between-stratum heterogeneity was modest in magnitude and largely explained by additive main effects, while the predicted probability gradient remained structured primarily by country and income-related positioning, with Brazilian strata consistently showing higher predicted IPV probabilities than Italian strata. The robustness checks therefore support the interpretation that the study's central inferences about intersectional disparities do not hinge on treating race/ethnicity as a comparable cross-national axis or on including the youngest respondents, while still underscoring that the sample's recruitment dynamics likely constrain external validity for absolute prevalence levels.