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# What's behind the Attitudes of the Ethnic Bulgarians in Reproductive Age towards Interethnic Marriages with Members of Bulgaria's Turkish Community?

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***Abstract:*** This piece of research investigates the determinants of ethnic Bulgarians' attitudes towards interethnic marriages with members of Bulgaria's Turkish community. A statistical analysis was conducted to examine the role of socio-demographic factors in shaping these attitudes. It discusses many factors but focuses on the statistically significant educational attainment, settlement type, family status, and net income. Higher levels of education do not necessarily lead to more tolerant attitudes towards interethnic marriages. Settlement type and family status emerge as influential determinants. Income is important in shaping attitudes, with the better-off households exhibiting higher approval rates to interethnic mixed marriages. These and other findings contribute to understanding interethnic attitudes and provide valuable insights for policymakers and stakeholders working towards fostering social cohesion and inclusion.
***Keywords:*** Attitudes, Bulgaria's Turks, ethnic Bulgarians, inter-ethnic marriages

Research on inter-ethnic marriages and the attitudes toward them is essential for understanding social distances and intercultural interactions in diverse societies. Mixed marriages have also been widely regarded as indicators of the social integration of diverse groups such as minorities, immigrants, etc., and as potential drivers of social and cultural change (Lanzieri, 2012b). The study of these phenomena can guide the development of educational programs, community interventions, and policies that foster inclusivity, cultural diversity, and social cohesion.

In the most recent census, ethnic Bulgarians constituted 84.6% (5,118,494 individuals) of the population, and 8.4% (508,378 respondents) self-identified as Turks (National Statistical Institute, 2022), making them the second largest ethnic group. A very important characteristic of this group is that, although it may seem like a community of (recent) immigrants, it actually comprises a non-immigrant local population that has resided on territories that are currently in the Republic of Bulgaria since the 14th century, after the conquest of Bulgaria's lands by the Seljuk Turks (Eminov, 2002)[3].

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[3] In 1878, following the Russo-Turkish War of 1877-78, an autonomous Bulgarian state was established on the lands predominantly inhabited by Bulgarians. This state gained full sovereignty and independence in 1908. It is one of the most recently established independent Balkan states from the remnants of the Ottoman Empire, constructed as a 'nationalizing national state' in the terminology of R. Brubaker (Brubaker, 1996).

The present-day ethnic Turks in Bulgaria are descendants of the Muslim/Turkish communities that remained in the country following the dissolution of the Ottoman Empire. Relations between ethnic Turks and ethnic Bulgarians are often shaped by constructed historical narratives. The Ottoman period is predominantly portrayed in Bulgarian folklore, history, and literature as an era of violence, the destruction of the Bulgarian state and its high culture, its disappearance from the political map of Europe for centuries, delayed social and economic development, and significant population losses (Isov, 2005).

Most of Bulgaria's governments, up until the end of 1989, regarded the sizable Turkish minority as a threat to national security. The mass emigration of this group was seen as a natural and necessary measure in building and developing the newly established ethnonational state. The remaining ethnic Turks were granted religious and linguistic rights by international and bilateral agreements. These included the right to education in Turkish in some schools, the publication of Turkish-language newspapers and magazines, and parliamentary representation. However, these rights were periodically restricted in response to internal and external factors (Gruev & Kalyonski, 2008).

The dissolution of the Ottoman Empire and the construction of the Republic of Turkey as a nationalizing nation-state, with an active policy of protecting or repatriating "external Turks" living outside its borders, deepened suspicions regarding the loyalty of Bulgaria's ethnic Turks to the Bulgarian state. In response, Bulgaria's authorities increasingly viewed the solution as heightened surveillance and control over Muslim communities, the restriction of their cultural and political rights, their economic marginalization, and the encouragement of gradual emigration. These measures were reinforced by the Treaty of Constantinople/Istanbul, signed in 1913, and the Treaty of Friendship between Bulgaria and Tukey, signed in Angora/Ankara, 1925 (Avramov, 2016).

In the 1970s and 1980s, the communist authorities carried out forced assimilation of the ethnic Turks, including forcible change of the Turkish-sounding names to Bulgarian ones, prohibition of their religious and cultural rituals and traditions, and a ban from speaking Turkish in public (Daily Sabah, 2019; Zafer, 2023), and when it became clear that these measures had failed, they resorted to another mass forced emigration. All of this led to the isolation of the two communities and increased distrust, prejudices, and mutual fears between them. One of the undeniable indicators of the increased social distances between them was the reduction in mixed marriages between Bulgarians and Turks from 1985 to the late 1990s (Denova, 2005).

The initial actions of the democratic forces following the fall of the communist regime were directed towards restoring the ethnic, cultural, political, social, and economic rights of Bulgaria's Turks as a priority and indicator of the country's democratic development. At the same time, the economic difficulties of the transition to a market economy, the resistance from those involved in the assimilative repressions, the activities of nationalist and populist parties, and the mainstream media slowed the cohesion processes and periodically inflamed interethnic tensions (Dedominicis, 2011; Eminov, 1999). Therefore, examining the factors that could lead to a faster reduction of these distances between ethnic Bulgarians and Turks is important and one of the main indicators for the democratization of interethnic relations in the country. Our primary goal here is, using already available survey data from another study (for details, see the methodology section), to develop a statistically sound model on socio-demographic determinants of ethnic Bulgarians that predict their

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attitudes towards the interethnic mixed marriages with members of Bulgaria's Turkish community[4].

## On the Determinants of Interethnic Mixed Marriages

Researchers have identified different *determinants (non-demographic ones)* that make people more open to mixed marriages. Individuals who hold positive attitudes towards cultural diversity and value intercultural exchange and understanding are more likely to support mixed marriages (Kalmijn, 1998; Khatib-Chahidi et al., 1998; Lee & Yoo, 2004; Silva et al., 2012). In contrast, individuals who hold negative attitudes towards other cultures and who believe in cultural purity and segregation are less likely to support mixed marriages or inter-marry (Falicov, 2015; Qian, 1999; Rodríguez-García et al., 2016).

Another salient determinant is the social context in which individuals live. Individuals who live in diverse and/or multicultural environments are more likely to be open to mixed marriages, as they have more opportunities to interact with people from different backgrounds and to learn about their cultures (Kalmijn, 1998; Yancey, 2002). Moreover, individuals who belong to minority groups or who have experienced discrimination themselves are more likely to support mixed marriages, as they see them as a way to challenge prejudice and promote social justice (Pittman et al., 2024; Yancey, 2007).

Personal experiences and relationships can also influence individuals' attitudes toward mixed marriages. For example, individuals who have close friends or family members who are in mixed marriages are more likely to support such unions, as they have positive role models and personal experiences that challenge stereotypes and prejudice (Kalmijn, 1998; Yancey, 2002). Moreover, individuals who have been in mixed relationships themselves are more likely to support mixed marriages, as they have experienced the benefits and challenges of such unions firsthand (Yancey, 2002).

Demographic determinants that shape people's attitudes to mixed marriages have also been studied. One such demographic factor is age. Younger generations are generally more open to mixed marriages than older generations (Livingston & Brown, 2017). This is partly because younger people have grown up in a more diverse and multicultural society and are more likely to have friends and peers from different racial and ethnic backgrounds (Newport, 2013). Moreover, younger generations are more likely to prioritize individualism and personal choice over tradition and social conformity (Mitev, 1994; Twenge et al., 2012), making them more open to choosing partners from different backgrounds (Kalmijn, 1998).

Another important socio-demographic determinant is education. Research has consistently shown that individuals with higher levels of education are more likely to support mixed marriages than individuals with lower education levels (Glick, 1988; Livingston & Brown, 2017; Wilson & Cardell, 1995). This is partly that because education can increase individuals' exposure to different

[4] The analysis below builds upon the descriptive analysis presented in the article "Attitudes and Distances of the Ethnic Bulgarians of Reproductive Age towards Mixed Marriages with Bulgarian Nationals of Turkish Descent" (Stoytchev, 2022), which discusses the attitudes of ethnic Bulgarians towards interethnic mixed marriages with members of Bulgaria's Turkish community from various perspectives, such as age, generation, gender, education, place of residence, presence of children, among others. Thus, a detailed descriptive analysis and discussion is not presented here. Both texts are part of a series of empirical analyses conducted by many researchers on survey data generated within the project "Measures to overcome the demographic crisis in the Republic of Bulgaria", funded by the Council of Ministers of the Republic of Bulgaria.

cultures and perspectives and can help to develop more positive attitudes towards diversity and multiculturalism (Kalmijn, 1998).

Simultaneously, evidence indicates a substantial decrease in educational homogamy among couples without a high school diploma and those with some college education. At the same time, a significant increase is observed among couples with high school diplomas and those with college degrees and higher (Qian, 1999). In addition, stratification theorists argue that achieved qualities such as education are more crucial than ascriptive criteria like social class, race, and ethnicity in determining socio-economic positions (Blau & Duncan, 1967; Strayhorn, 2023). Empirical studies have also confirmed such an argument, revealing that social boundaries between educational groups are more robust during mate selection than between religious groups or groups with fathers from different occupational classes. Strong educational boundaries make crossing racial barriers relatively easier (Kalmijn, 1991a, 1991b).

Gender has also been identified as a socio-demographic determinant that can influence attitudes towards mixed marriages. Women are generally more open to mixed marriages than men (Kalmijn, 1998; Livingston & Brown, 2017). This may be because women are more likely to value emotional intimacy and personal connection in relationships, which can make them more open to choosing partners based on shared values and interests rather than race or ethnicity (Durak, 2024; Falicov, 2015).

The type of geographic location where people live has also been identified as a demographic determinant that can influence attitudes toward mixed marriages. Individuals who live in urban areas are generally more open to mixed marriages than those who live in rural areas (Kalmijn, 1998; Livingston & Brown, 2017). This may be due to the fact that urban areas are more diverse and multicultural and provide more opportunities for individuals to interact with people from different backgrounds and to learn about their cultures. Overall, ethnic Bulgarians in rural areas show a slightly higher likelihood of intermarrying with ethnic Turks compared to those ethnic Bulgarians who live in small towns (Stoytchev, 2022). This trend may be attributed to the significant internal and external migrations of young ethnic Bulgarians from rural areas, which narrows the pool of potential marriage partners for the ethnic Bulgarians who remain. Additionally, the relatively younger Turkish population residing in rural areas, comprising over half of the total Turkish population, creates a scenario where interethnic marriages become more acceptable due to limited options for same-ethnicity unions.

In summary, non-demographic (e.g., attitudes towards diversity and multiculturalism, the social context in which individuals live, and personal experiences and relationships) and demographic and social determinants such as age, education, gender, etc. have the potential to influence people's opinion and behavior with regard to interethnic mixed marriages. Understanding determinants can help to promote more positive attitudes towards mixed marriages and to create a more inclusive and tolerant society.

## Determinants of Mixed Marriages in Bulgaria: A Contextual Analysis

To this point, the determinants of interethnic mixed marriages have primarily been reviewed from more or less a broader perspective, lacking empirical investigation specifically within the context of interethnic marriages between the ethnic Bulgarians and the members of Bulgaria's Turkish community. Although various authors have addressed this issue descriptively over the years, it is noteworthy that the topic has rarely been the primary focus of research endeavors. Instead, it has often been incorporated among broader research objectives, such as examining attitudes, distances or stereotypes towards minority populations in Bulgaria (Pamporov,

ISSN: 2149-1291

2009; Tomova & Yanakiev, 2002). Consequently, the comprehensive examination of determinants pertaining specifically to interethnic marriages between members of the Bulgarian and Turkish ethnic groups remains largely unexplored in empirical studies thus far.

Historical specifics of the relations between ethnic Bulgarians and Turks significantly influence the attitude towards interethnic marriages. Unlike Turkish diasporas in Western Europe, which arose from recent labor migration, the Seljuk Turks conquered the Balkans in the 14th-15th centuries. Ottoman rule in Bulgarian lands lasted for almost five centuries until 1878. Ottoman documents reveal that interfaith marriages, particularly Muslim men marrying Christian women, were actively promoted as a means of Islamizing the indigenous Christian population in Asia Minor and the Balkans. In the context of the Ottoman Empire, the marriage of a Christian woman to a Muslim man, whether voluntary or forced, led to significant losses for the family and local community, as it meant losing not only the fertile woman but also her offspring. On the other hand, marriage between a Christian man and a Muslim woman was virtually impossible, with severe consequences for the man, including death or the choice between death and conversion to Islam. These historical restrictions had a profound impact on interfaith marriages among the ethnic Bulgarian population and probably continue to shape attitudes towards interethnic unions today among certain groups (Denova, 2005).

To protect its girls and young women from voluntarily marrying a Muslim (referred to by the Bulgarian population in the Ottoman Empire as a "Turk"), the ethnic Bulgarian community erected religious, ethnic, and socio-psychological barriers to voluntary unions between Christian women and Muslim men. The Orthodox Church strictly limited marriage to Orthodox members. During Ottoman rule, the relationship of a Bulgarian woman with a Muslim man was perceived as apostasy, leading to her exclusion from the Bulgarian community. These historical factors continue to influence attitudes towards interfaith and interethnic marriages, reflecting deep-rooted social and cultural norms (Karamihova, 1991, 1995).

During the 1970s and 1980s, Bulgaria's communist leadership was increasingly alarmed by the military coup in Turkey, the worsening relations between Turkey and Greece, and the Cyprus conflict, which resulted in the division of the island. They were consumed by the fear that the "Cyprus model" could be replicated in Bulgaria. Their attention was fixated on the perceived "demographic invasion" posed by the growing Turkish minority in Bulgaria, and they sought to scapegoat this group for the country's economic difficulties (Baeva & Kalinova, 2009). These anxieties, heightened by the economic and social challenges faced by the communist regime, culminated in the irrational decision to launch a rapid and comprehensive forced assimilation campaign aimed at Bulgaria's second-largest ethnic group. As a result of these policies, approximately 350,000 Bulgarian Turks were expelled from the country in 1989 (Kalchev, 2019). The government's actions during this period deeply affected the Turkish minority and had lasting social and political repercussions, shaping interethnic relations and respective attitudes towards mixed marriages in the country.

Over the years of post-communist development in the country (from 1990 to the present), significant demographic changes have occurred, increasing the likelihood of interethnic marriages between Bulgarians and Turks. Internal migrations from rural to urban areas, particularly among relatively young populations in the 1990s, intensified among the Turkish population due to difficulties in finding employment in villages and the closure of thousands of rural schools following a decline in the number of children after 1989 (Tomova, 2005). This led to a reduction in educational disparities between Bulgarians and Turks (Tomova & Stoytchev, 2022), creating more opportunities for interactions and friendships between children and young people from both ethnic groups and increasing the chances of mixed marriages/cohabitations, especially in large

cities. External migrations, which have been intensive among the youth in both groups (Kalchev, 2019), also contributed to the reduction in the number of young people in both villages and small towns. This has narrowed the opportunities for finding a suitable partner within one's own ethnic group and facilitated the formation of interethnic family unions and marriages.

Research shows that the share of mixed marriages (or intermarriages) has not significantly increased in Bulgaria over the years. At the same time, there is evidence of a strong propensity of Bulgarians to marry out of their citizenship/ethnic group (Lanzieri, 2012a). Although these data are more than a decade old and the term "mixed" is used by G. Lanzieri for marriages where one spouse holds national citizenship and the other a foreign citizenship, they imply that changes in social attitudes towards diversity and multiculturalism after the end of the totalitarian regime in 1989 might have started to increase but are not widespread yet. Future research to examine this aspect would be valuable.

At the same time, the increasing influence of nationalist and populist parties in the political life of the country has led to a strengthening of racist and conservative discourse in parliament and the media. Hate speech towards the "other" has become normalized. In Bulgaria, effective measures to counteract these trends are not being implemented (BHC, 2023; Bulgarian National Radio, 2023). There has been a discernible resurgence of conservative gender attitudes and traditional conceptions of the roles of men and women within families. In Bulgaria's Muslim communities, this shift manifests as a return to more restrictive perspectives on deviations from established moral norms. Notably, there has been an increase in disapproval of divorce, cohabitation without marriage, childbirth outside of wedlock, and abortion when compared to 2011. Furthermore, intergenerational dynamics within families have also reverted to traditional models, with an enhanced role for parents in making significant decisions regarding their children and young adults. This includes decisions related to marriage, continuing education after secondary school, and choosing to relocate abroad (Ivanov, 2020).

A former deputy prime minister V. Simeonov and his party, the National Front for Salvation of Bulgaria, pursued campaigns that advocated for the transformation of Roma settlements into tourist attractions, endorsed birth control measures through the distribution of free contraceptives, and orchestrated organized campaigns, processions, and events aimed at impeding the voting rights of Bulgarian nationals of Turkish and Roma descent. V. Simeonov himself resorted to forceful tactics, as exemplified by his actions of pushing and threatening an elderly woman of Turkish origin to prevent her from exercising her right to vote (Mihailova, 2018).

Another leader of a nationalist party, V. Siderov[5], openly expressed his desire for Bulgaria's Turkish population to reside in Turkey and for the Roma community to be relocated to Saturn (Daynov, 2023). These documented incidents, alongside similar occurrences, have significantly contributed to the polarization of Bulgarian society. Consequently, the population finds itself divided, with some individuals advocating for increased diversity and inclusivity while others actively resist such transformative changes.

Interethnic mixed marriages are gradually becoming more common in Bulgaria, reflecting, to some extent, broader trends towards greater openness and diversity in society. However, the issue remains controversial and polarizing, with some Bulgarians continuing to hold negative stereotypes and prejudices towards individuals from different ethnic backgrounds.

[5] In 2018, V. Siderov and his political party Ataka were part of the United Patriots coalition. This coalition, together with the pro-EU, conservative, and populist political party GERB, formed the government in May 2017, governing for approximately four years.

Journal of Ethnic and Cultural Studies
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## Methodology

### About the Data

This study uses data from the nationally representative[6] survey "Attitudes towards Fertility, Family Policies, and Vulnerable Communities," produced by Market Links OOD and the Institute for Population and Human Studies at the Bulgarian Academy of Sciences (IPHS-BAS).

The questionnaire, developed by IPHS-BAS researchers in collaboration with external project consultants, aimed to collect data on social and demographic policies related to fertility and families, primarily for governmental purposes but also for broader applications. The data collected in this project are stored by IPHS-BAS and, to date, are not available for free access. Table 1 below provides concise descriptions, data types, and names[7] of the variables used in our analysis.

[6] To achieve representativeness of the results and minimize stochastic error, multi-stage cluster random sampling was employed, stratified by NUTS 2 regions, districts and settlement types, including capital city, large city, medium town and small settlement. The survey was conducted between 26/02/2018 and 30/03/2018 (Market Links, 2018).
[7] The variable name column is included to further facilitate the reading of Figure 1 below.

**Table 1**

*Variables Included in the Analysis*

| Socio-demographic characteristic | Description | Variable data type | Variable name |
|---|---|---|---|
| Age | Age in calendar years. | Numeric, original variable. | age |
| Age groups | Each respondent's age group. 7 age subgroups over the 18-55 age group. | Categorical, recoded variable. | age_groups |
| Demographic generation | Respondents group into X (born 1980 or earlier), Y (born between 1981 and 1996) and Z (born 1997 or later) demographic generations. | Categorical, recoded variable. | gen |
| Initial socialization | Indicates whether the respondent was born/socialized under the communist regime or during the transition. | Categorical, recoded variable. | generation |
| Sex | Respondents' sex | Categorical, original variable. | gender |
| Education | Respondents' educational attainment – 8 levels. | Categorical, original variable. | education |
| Education | Respondents' educational attainment – 4 levels. | Categorical, recoded variable. | edu |
| Education | Respondents' educational attainment – 3 levels. | Categorical, recoded variable. | educ |
| Employment status | Respondents' employment status – 10 levels. | Categorical, original variable. | empl_status_en |
| Employment status | Respondents' employment status – 3 levels. | Categorical, recoded variable. | empl_stat |
| Children | Binary variable showing whether the respondent has their own children. | Categorical, original variable. | children |
| Family status | Respondents' family status – 6 levels. | Categorical, original variable. | family_status_en |
| Household members | Number of persons living in the household of the respondent. | Numeric, original variable. | hh_members |
| Household members under 18 | Number of children living in the household of the respondent. | Numeric, original variable. | hh_u18 |
| Income | Respondents' income group status – 7 levels. | Categorical, original variable. | income |
| Income | Respondents' income group status – 3 levels. | Categorical, recoded variable. | income_3_gr_en |
| Industry | Respondents' industry of employment – 18 levels. | Categorical, recoded variable. | industry |
| Social class | Respondents' class, based on their occupation (Goldthorpe class schema) – 18 levels. | Categorical, recoded variable. | occup_soc_stratification |
| Province | Province where the respondents live – 28 levels. | Categorical, original variable. | province |
| Settlement type | Respondents' settlement type based on inhabitants and urbanization – 5 levels. | Categorical, original variable. | place_type_en |

Journal of Ethnic and Cultural Studies
2024, Vol.11, No. 4, 169-191
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ISSN: 2149-1291

## On Dependent and Independent Variables

The survey's questionnaire included questions about the respondents' attitudes towards Bulgaria's Turkish minority. The questions followed the pattern "Would you approve of …" and asked respondents to choose between 'yes' or 'no'[8] to social-political problems related to tolerance and discrimination, such as "Would you approve of sitting next to an ethnic Turkish person on the bus?" or "Would you approve of a senior officer in the Bulgarian Army to be a Turk" as well as more personal and intimate issues such as "Would you approve of living in shared housing with a Turk?" or "Would you approve of your child/grandchild marrying someone from Bulgaria's Turkish community?" For this research, we had access to and used a subset of the whole data set (Tables 1 and 2). Having access to these empirical data, which with minor adaptation could potentially shed light on the socio-demographic determinants of interethnic marriages between ethnic Turks and ethnic Bulgarians from a quantitative perspective, presented a valuable opportunity that we pursued.

The *dependent/response variable* analyzed in this study pertains to individuals' attitudes towards interethnic mixed marriages, as assessed by their responses to the question, "Would you approve of your child marrying someone from Bulgaria's Turkish community?". During the survey interviews, respondents were given three options: "Yes, I do approve," "No, I do not approve," and "Don't know / Can't say." The collected raw data were recoded into a binary variable with two levels: "disapprove" (disapprove = 0) and "approval / dk" (approve/dk = 1). That was to prepare the data for a logistic regression modelling. About 60.2% of the respondents disapproved interethnic marriage between ethnic Bulgarians and members from the Turkish ethnic minority.

Attitudes to marriage variable was selected for two major reasons. Marriages are considered an excellent indicator of social distances between groups because they represents the most intimate and enduring form of social relationship, requiring high levels of trust, acceptance, and integration. Willingness to marry across group lines signifies a significant reduction in social barriers and prejudices, highlighting close social proximity and mutual acceptance (Kalmijn, 1998). Additionally, the distribution of responses to the question was statistically well-balanced, with a ratio of 60:40. This balance is important when employing learning models, such as the logistic regression used in this research.

Additionally, a set of 19 explanatory variables (Tables 1 and 2) encompassing socio-demographic characteristics (SDC) was included in the analysis. Among these variables, 14 were derived directly from the raw data collected during the survey (missing data, if any, imputed), while the remaining 5 were constructed using data from supplementary sources and/or through recoding. The comprehensive set of explanatory variables provides a multifaceted perspective on the determinants of individuals' attitudes towards interethnic mixed marriages.

[8] In addition, 'don't know'/'can't say' options were available, but these options were not read by the interviewer and rarely registered only when the respondent was confused and unable to choose between 'yes' or 'no'.

**Table 2**

*Data Summary of the Key Social-Demographic Characteristics (after imputations, N = 1287)*

| Characteristics | Levels | N (%) | Mean (SD) | Min | Max |
|---|---|---|---|---|---|
| Age | - | - | 37.7 (9.8) | 18 | 55 |
| Age groups | 1 = 18-22; | 98 (7.6) | - | - | - |
| | 2 = 23-28; | 173 (13.4) | | | |
| | 3 = 29-34; | 222 (17.2) | | | |
| | 4 = 35-40; | 236 (18.3) | | | |
| | 5 = 41-46; | 256 (19.9) | | | |
| | 6 = 47-52; | 243 (18.9) | | | |
| | 7 = 52+ | 59 (4.6) | | | |
| Sex | 1 = Male; | 749 (58.2) | - | - | - |
| | 2 = Female | 538 (41.8) | | | |
| Education | 1 = Tertiary education; | 513 (39.9) | - | - | - |
| | 2 = Secondary education; | 704 (54.7) | | | |
| | 3 = Primary or lower education | 70 (5.4) | | | |
| Employment status | 1 = Works; | 1012 (78.6) | - | - | - |
| | 2 = Does not work/study; | 190 (14.8) | | | |
| | 3 = Studies | 85 (6.6) | | | |
| Children | 1 = Has own children; | 850 (66) | - | - | - |
| | 2 = No children; | 437 (34) | | | |
| Family status | 1 = Widowed; | 16 (1.2) | - | - | - |
| | 2 = Separated; | 29 (2.3) | | | |
| | 3 = Divorced; | 68 (5.3) | | | |
| | 4 = Living together; | 270 (21.0) | | | |
| | 5 = Married; | 567 (44.1) | | | |
| | 6 = Single | 337 (26.2) | | | |
| Household members | - | - | 3.1 (1.1) | 1 | 7 |
| Household Net Income (1 EUR =1.95583 BGN) | 1 = BGN 999 or less; | 442 (34.3) | - | - | - |
| | 2 = BGN 1000-1999; | 504 (39.2) | | | |
| | 3 = BGN 2000+ | 341 (26.5) | | | |
| Settlement type | 1 = Capital; | 307 (23.9) | - | - | - |
| | 2 = Large district town, population > 100k+; | 267 (20.7) | | | |
| | 3 = District town, population < 100k; | 229 (17.8) | | | |
| | 4 = Small town; | 248 (19.3) | | | |
| | 5 = Village | 236 (18.3) | | | |

## Notes on data and their limitations

The survey respondents' age range covers 18 to 55 years old. All 1506 adult respondents were interviewed using a standardized face-to-face questionnaire. This study focuses on the age groups of men aged 18-55 and women aged 18-50. These age groups partially overlap with Bulgaria's 2018 working-age population (15-64), allowing for some cautious conclusions about that group and, to a lesser extent, about the broader society.

Pensioners were excluded from the survey because of the sample's age limits, except for five pre-retirees. While the exclusion of persons aged over 55 does limit the generalizability of the findings with regard to the overall population, the study remains valuable, being representative of a population of more than 3 million people and encompassing key age groups for the demographic and economic development of the country.

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However, it is important to note that the excluded population of individuals aged 55 and over constitutes approximately one-third of Bulgaria's population, as per Eurostat 2018 data. Moreover, this age group is active in exercising their right to vote, and the opinions of its members hold significant weight, not only on issues that directly affect them. Nonetheless, while the limitations associated with the available data are acknowledged, the findings of the statistical-sociological analysis below offer valuable insights for researchers and stakeholders alike, providing a basis for strategic planning, policy-making, programs, and projects.

It is also important to acknowledge that the present study is limited by the absence of certain highly probable determinants due to the non-exhaustive nature of the available survey data we had access to. For instance, data on respondents' religiosity, religiousness, experience with diversity and multiculturalism, political affiliation, and sharing of liberal/conservative values were not collected during the interviews. Nevertheless, the findings and the models below demonstrate usefulness despite this limitation.

## On Statistical Methods

A good and interpretable model requires few variables. Thus, data preparation was undertaken to select and recode relevant socio-demographic variables, including imputations for missing data. Missing data imputations were carried out using the random forest algorithm for classification and regression, as proposed by Breiman (2001) and implemented in R, version 4.2.3 (R Core Team, 2023). To maintain consistency and enable reproducibility, a predetermined seed value of 1113 was employed for all calculations, with the selection of the value being random.

Following the imputations and subsequent data transformation, the dataset experienced a reduction in observations from its original size of 1506 to 1287. This reduction occurred as part of the data cleaning process, wherein all respondents who identified a non-Bulgarian ethnicity were excluded from the dataset. Focusing exclusively on the ethnic Bulgarian population, the analysis maintains a specific and targeted perspective on the research objectives. These steps of imputations, data transformation, and targeted population selection prepared the dataset for further analyses and interpretation.

The data partitioning strategy involved a random split, with 70% of the data allocated to a training dataset (N=903), while the remaining 30% served as a separate test dataset (N=384) to assess the performance of the models using "new" data.

## Results and Discussion

### Importance of the Variables

Prior to conducting the logistic regression modeling, a thorough examination of the 19 explanatory variables was conducted to assess their importance in relation to the attitudes of the respondents to interethnic mixed marriages between ethnic Bulgarians and ethnic Turks using the Boruta variable selection algorithm. Being a versatile algorithm, Boruta can be applied alongside any classification method that generates a variable importance measure through the Random Forest method. This algorithm employs a top-down approach to identify relevant features (variables) by comparing the original attributes' importance with the importance attainable at random, estimated through permutations of their copies. It progressively eliminates irrelevant features (variables) by iteratively comparing attribute importances with those of shadow attributes, which are created by shuffling the original attributes. Attributes displaying significantly lower importances than their

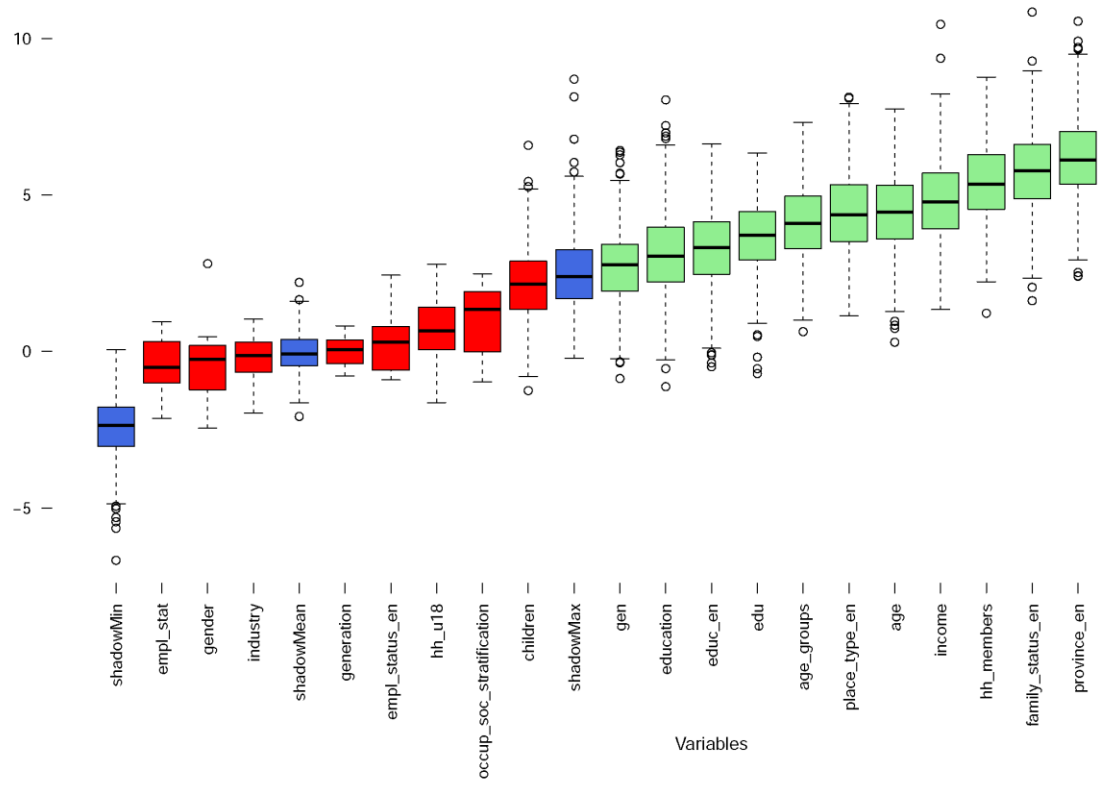
corresponding shadows are sequentially eliminated, while those exhibiting significantly higher importances are deemed worthy of further exploration (Kursa & Rudnicki, 2010).

This initial analytical step provides statistical evidence to figure out which determinants, among the available variables, should be considered during modeling, while identifying those less likely to yield reliable statistical evidence. The Boruta procedure was applied to the data described above (not to the train/test data), as this analysis serves a preliminary purpose and does not influence the subsequent logistic regression modelling. Its primary goal is to inform the selection of relevant determinants and ensure the subsequent modeling process uses reliable and pertinent variables. That a variable is important does not mean that it would fit well in a logistic or other machine learning model.

The 11 variables on the right side of the graph (Figure 1) are those that the algorithm confirms as relevant to the attitudes of the ethnic Bulgarians towards the interethnic mixed marriages with ethnic Turks. These variables demonstrate an interrelationship with the variability of the dependent variable. In contrast, the eight variables listed on the left side lack relevance in this context. Additionally, the graph includes three boxplots with names containing the term "shadow." These boxplots describe the distribution and the variability of the shadow variables, which are generated by the Boruta algorithm. These shadow variables play a crucial role in the determination of variable importance.

**Figure 1**

*Importance of the Explanatory Variables, Boruta Algorithm*




*Note.* Author's calculations.

Journal of Ethnic and Cultural Studies
2024, Vol.11, No. 4, 169-191
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The geographical context in which respondents reside, characterized by specific cultural attributes and varying economic growth and development levels, holds significant relevance according to the Boruta analysis results. Notably, the provinces where individuals live emerge as crucial determinants. Furthermore, the variable indicating settlement place type, which classifies settlements along the urban-rural continuum, demonstrates its importance in understanding ethnic Bulgarians' attitudes towards interethnic marriages with individuals from Bulgaria's Turkish community.

Education and income are also identified as relevant variables. This seems to be in harmony with recent data from Bulgaria's National Statistical Institute that discloses an association between lower educational attainment and a higher likelihood of experiencing poverty (National Statistical Institute, 2024). This implies that the education and income variables are interrelated. Regardless of the specific recoding approach employed for the raw data on education (whether it involves 8, 4, or 3 levels), its significance is consistently confirmed. How education influences the discussed attitudes becomes a valid and important research question.

The same is relevant for the income variable, but it is important to note that the raw income data initially contained approximately 25.5% missing observations. To address this issue (as mentioned above), imputation was performed using a supervised learning approach, specifically employing the Random Forest algorithm. Through this imputation process, the missing data were estimated, allowing for a more complete and comprehensive analysis of the income variable in relation to attitudes towards interethnic marriages. However, this intervention should be taken into account when assessing the quality of the models later because the income variable is not as authentic as the education one.

Age, along with its derived variables, emerges as a relevant determinant, indicating its relevance in shaping attitudes towards interethnic marriages. Additionally, the size of respondents' households seems to have the potential to contribute to understanding these attitudes. These variables shall not be discussed in detail here because they turned out to be statistically insignificant when the logistic regression method was employed. This does not mean that in other modeling context they might turn out useful.

## Socio-Demographic Determinants of Interethnic Marriages: Logistic Regression Models

George Box, a prominent statistician and scholar, famously stated that all models are wrong, but some are useful (Box & Draper, 1987). Considering that, numerous models incorporating the discussed variables were subjected to testing. The majority of them proved to be "wrong," either in terms of statistical significance or substantive relevance. Two models, though, have emerged as worthy of attention and discussion due to their usefulness (Table 3). These models exhibit statistical significance, decent ROC curves, fit that data well, and, most importantly, in terms of accuracy, outperform the baseline rate when predicting with unknown/test data. In short, it is definitely much better to predict/analyze an interethnic/mixed marriage attitudes using these models than not using them. However, the limitation of the available data prevents the development of significantly improved models without incorporating external data, which falls beyond the scope of this research.

The first model, referred to as FSE (an acronym derived from the features names utilized), incorporates three variables: family status, settlement type, and educational attainment. This model unveils how these characteristics contribute to explaining the attitudes of ethnic Bulgarians toward interethnic mixed marriages with individuals from the Turkish community in Bulgaria. The second model, labeled FSI, replaces the educational attainment indicator with a net income indicator while

retaining family status and settlement type (Table 3). Both models exhibit similar performance in terms of model accuracy, with FSI slightly outperforming when considering unknown data, potentially influenced by the supervised imputation of approximately one-fourth of its data. Overall, these two models with these four variables not only reveal statistically significant socio-demographic determinants of interethnic mixed marriages but also offer a reliable predictive tool for estimating individuals' attitudes with an accuracy rate of over 60% (Table 4).

**Table 3**

*Logistic Regression Models: Socio-Demographic Determinants of the Attitudes towards Mixed Marriages between Ethnic Bulgarians and Ethnic Turks*

| | Model FSE (train data) | | | | Model FSI (train data) | | | |
|---|---|---|---|---|---|---|---|---|
| Determinant | Odds Ratio | 95% Confidence Intervals | | p-value | Odds Ratio | 95% Confidence Intervals | | p-value |
| **Family status** | | | | | | | | |
| Married | 1.00 | Ref. | | | 1.00 | Ref. | | |
| Widowed | 4.87 | 1.53 | 18.42 | **0.010** | 4.58 | 1.43 | 17.45 | **0.014** |
| Separated | 1.17 | 0.43 | 2.96 | 0.748 | 1.12 | 0.41 | 2.85 | 0.812 |
| Divorced | 2.12 | 1.12 | 4.05 | **0.021** | 2.24 | 1.16 | 4.34 | **0.016** |
| Living together | 1.62 | 1.12 | 2.33 | **0.010** | 1.69 | 1.16 | 2.45 | **0.006** |
| Single | 1.48 | 1.06 | 2.08 | **0.023** | 1.48 | 1.05 | 2.10 | **0.025** |
| **Settlement type** | | | | | | | | |
| Small town | 1.00 | Ref. | | | 1.00 | Ref. | | |
| Capital | 1.63 | 1.06 | 2.53 | **0.028** | 1.39 | 0.87 | 2.23 | 0.17 |
| Large district town > 100k population | 1.48 | 0.95 | 2.31 | 0.084 | 1.52 | 0.98 | 2.39 | 0.06 |
| District town < 100k population | 1.55 | 0.98 | 2.45 | 0.060 | 1.58 | 1.00 | 2.50 | **0.049** |
| Village | 1.48 | 0.94 | 2.36 | 0.094 | 1.42 | 0.90 | 2.26 | 0.137 |
| **Educational attainment** | | | | | | | | |
| Secondary education | 1.00 | Ref. | | | - | - | | - |
| Tertiary education | 1.34 | 1.00 | 1.78 | **0.047** | - | - | | - |
| Primary education or lower | 1.33 | 0.72 | 2.44 | 0.357 | - | - | | - |
| **Net income** *(*1 EUR =1.95583 BGN*)* | | | | | | | | |
| BGN 1000-1999 | - | - | | - | 1.00 | Ref. | | |
| BGN 999 or less | - | - | | - | 1.25 | 0.90 | 1.75 | 0.181 |
| BGN 2000+ | - | - | | - | 1.70 | 1.17 | 2.48 | **0.005** |

*Note.* Author's models and calculations (IPHS-Market links 2018 survey).

The Area Under the Curve (AUC) serves as a comprehensive measure of diagnostic accuracy. An AUC value of 0.5 signifies that the ROC curve aligns with random chance, while a value of 1.0 represents perfect accuracy. An estimated AUC that is less than 0.5 indicates that the test performs worse than chance. The AUC metric takes into account the True Positive Rate and False Positive Rate of a model at various cut-off thresholds. When evaluating model performance using the Accuracy metric (such as in Table 4), it is also recommended to consider additional

Journal of Ethnic and Cultural Studies
2024, Vol.11, No. 4, 169-191
http://dx.doi.org/10.29333/ejecs/1902

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metrics. AUC provides a more comprehensive assessment by capturing the model's performance across different thresholds and considering both true and false positive rates.

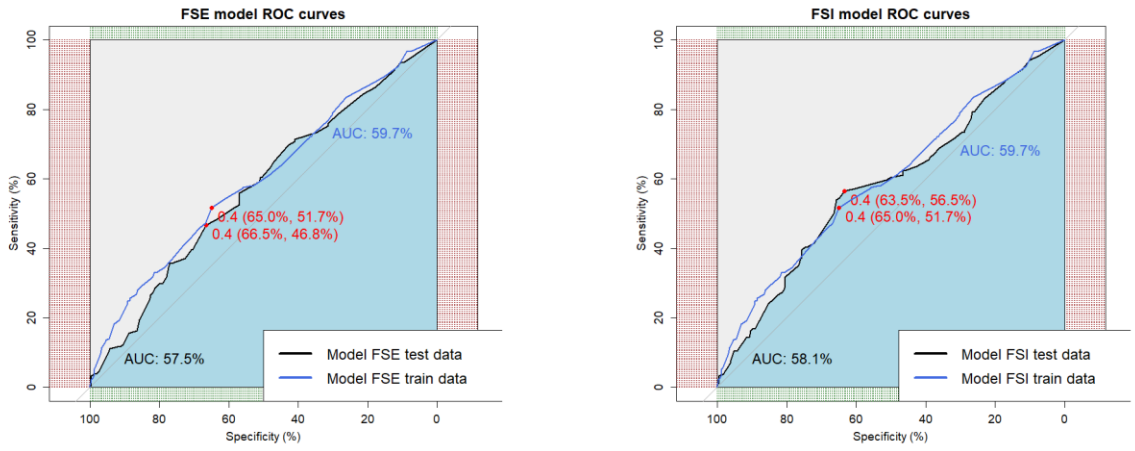
**Table 4**
*Model comparisons*

| | Model FSE | Model FSI |
|---|---|---|
| Null deviance (Null df) | 1212.8 (902) | 1212.8 (902) |
| Residual Deviance (Residual df) | 1184.3 (891) | 1180.5 (891) |
| AIC | 1208.3 | 1204.5 |
| Hosmer-Lemeshow goodness of fit test p-value | 0.061<br>If less than 0.05 that means that there's evidence that the model doesn't fit the data well. | 0.505 |
| Model performance: accuracy | | |
| Train data (baseline) | 62.57% (60.35%) N = 903 | 61.57% (60.35%) N = 903 |
| Test data (baseline) | 60.42% (59.9%) N = 384 | 60.68% (59.9%) N = 384 |

*Note.* Author's calculations (IPHS-Market links 2018 survey).

Figure 2 indicates that the models outperform the 50% threshold, signifying their effectiveness. Therefore, presenting and discussing the results from Table 2 above would be meaningful and informative. The models' performance, as evidenced by the AUC and other relevant metrics, supports their utility in predicting and explaining attitudes towards interethnic mixed marriages among ethnic Bulgarians. The minimal differences in model accuracies and their ROC curves using train and test data (see Table 4 and Figure 2) provide evidence that overfitting has been avoided.

**Figure 2**
*ROC curves of the FSE and FSI models*




*Note.* Author's calculations.

## Socio-Demographic Determinants of Interethnic Marriages

From a policy perspective, it is prudent to commence the analysis of the results by focusing on the education determinant. This choice is driven by the feasibility of initiating changes or reforms within the educational system, compared to other modeled characteristics such as the geographical context of respondents' residence and/or family status. Subsequently, the analysis of income will be undertaken, driven by similar considerations, followed by an examination of the family status and the geographical/territorial context in which respondents reside.

In comparison to ethnic Bulgarians who have completed secondary education (the reference group), ethnic Bulgarian university/college graduates demonstrate higher odds[9] of approving interethnic marriages with members of the Bulgaria's Turkish community (see Table 3, model FSE). Specifically, their odds are multiplied by a factor of 1.34 (that is, their odds are 34% higher) holding constant their family status and the geographical/territorial context of their residence. Surprisingly, individuals with primary education or lower also exhibit greater approval compared to secondary school graduates. In fact, their odds, with a coefficient of 1.33, are nearly equivalent to those of university graduates. Notably, the confidence intervals suggest a highly improbable but theoretically possible situation where tertiary education graduates could exhibit the same levels of approval as secondary school graduates. In contrast to other findings on the subject – higher levels of education are positively associated with support for interethnic mixed marriages, contrasting with lower levels of education (Glick, 1988; Livingston & Brown, 2017; Wilson & Cardell, 1995), the results from Bulgaria indicate that the higher the education of a person does not necessarily mean a more tolerant attitude towards interethnic unions. Instead, being a secondary school graduate is associated with lower levels of openness, tolerance, and positivity towards interethnic mixed marriages between ethnic Bulgarians and Turks compared to a person who graduated from primary school.

Further research should investigate the content of nowadays Bulgarian history and literature textbooks to assess if they perpetuate negative stereotypes and prejudices against Turks, similar to the pre-1990 era. Additionally, examining the attitudes of teachers in these subjects, especially in small towns and villages, where a significant number are pre-retirement and retirement age, is crucial. These teachers may carry deep-rooted negative prejudices against Turks, impacting their professional development. If the education system in Bulgaria aligns with negative nationalist, racist, and conservative discourse, it could hinder interethnic marriages between the country's two largest ethnic groups and potentially explain the lower inclination of early school leavers towards mixed ethnic marriages.

In comparison to ethnic Bulgarians from households with a net income of BGN[10] 1,000-1,999 (the reference group), individuals residing in more affluent households (net income BGN 2,000+) exhibit higher odds of approving interethnic marriages between ethnic Bulgarians and Turks (see table 3, model FSI). Their odds are multiplied by a factor of 1.7, indicating a higher level of approval while controlling family status and the geographical/territorial context in which they reside. Interestingly, ethnic Bulgarians from households with a net income of BGN 1,000-1,999 demonstrate the lowest odds of approving such marriages. These individuals can be

[9] In probability theory, odds serve as a quantitative measure of the likelihood of a specific outcome. They are computed as the ratio of the number of favorable events divided by the number of unfavorable events. Odds find wide application in fields such as statistics, betting and gambling.

[10] According to Bulgaria's National Bank data, during the survey period (March 26-30, 2018) the exchange rate was USD 1≈ BGN 1.58. Bulgaria's currency is fixed to the Euro, EUR 1 ≈ BGN 1.96. For detail, visits https://www.bnb.bg/Statistics/StExternalSector/StExchangeRates/StERForeignCurrencies/index.htm

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2024, Vol.11, No. 4, 169-191
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characterized as belonging to the lower middle class, considering the economic situation in 2018. Their household income falls between 2 to 4 times the minimum salary, and unless the household consists of 5 or more members (which is unlikely among ethnic Bulgarians), these households are usually above the poverty line (BGN 321). On the other hand, households with incomes of BGN 2,000 and above can be associated with the middle and upper middle class (the likelihood of truly wealthy individuals participating in the sample is very low, though theoretically possible, and cannot influence the results). Notably, households with incomes below BGN 1,000 can be linked to individuals living in poverty and facing exclusion from various aspects of social life. Interestingly, these underprivileged individuals who experience poverty display higher levels of approval for interethnic marriages between ethnic Bulgarians and Turks. This definitely deserves further research.

The long coexistence between Bulgarians and Turks in Bulgaria may explain the relatively balanced image of the "other." Previous research on ethnic Bulgarians' attitudes towards Turks revealed strong ambivalence, with persisting positive stereotypes depicting Turkish individuals as hard-working, responsible, thrifty, loyal, and family-oriented (Mitev, 1994; Tomova & Yanakiev, 2002). Such qualities in a marriage partner could stabilize the family, break the cycle of poverty and social exclusion, and not diminish the social status of poor ethnic Bulgarians who enter into mixed marriages with Turks. This complex interplay of attitudes towards the "other" reflects the intricate dynamics of interethnic relationships in the country.

Compared to married ethnic Bulgarians (the reference group), the odds of the widowed ethnic Bulgarians, approving interethnic marriages with members of the Bulgaria's Turkish community, are multiplied by a factor of 4.87 (that is, their odds are much higher), holding constant their educational attainment and the geographical/territorial context in which they reside (see table 3, model FSE). Married ethnic Bulgarians are the group with the lowest odds of approving interethnic mixed marriages between ethnic Bulgarians and Turks. On the other hand, widowed and divorced Bulgarians, individuals who have experienced the loss of a partner through death or divorce, have the highest odds of approval. While there is no direct evidence, it is worth exploring the hypothesis that the loss of a partner may lead to a shift in the importance placed on the ethnicity of a potential partner, with other personal characteristics becoming more significant for widowed and divorced individuals. Further research is necessary to delve into this hypothesis. The FSI model (see Table 3) shows results that have similar interpretations but hold constant their net income and the geographical/territorial context in which they reside.

In comparison to ethnic Bulgarians residing in small towns (reference group), individuals living in the capital city display significantly higher odds of approving interethnic mixed marriages between ethnic Bulgarians and Turks (refer to Table 3, Model FSE). Their odds are multiplied by a factor of 1.63, indicating a stronger inclination toward approval while considering their family status and geographical/territorial context. Similar patterns are observed among residents of district towns and villages. Doubtlessly, ethnic Bulgarians residing in small towns exhibit the lowest odds of approving interethnic marriages. Although further investigation is required to fully understand these dynamics, these findings underscore the need for targeted allocation of resources and efforts by government and stakeholders.

After repeated testing using logistic regression models, we found that the majority of the variables (including some identified as important by the Boruta algorithm) were not statistically significant when combined in models. These variables included age, age groups, demographic generation, initial socialization, gender, employment status, the number of household members, the number of children in the household, whether the respondents have children or not, the social

class of the respondents, and the industry they work in (for descriptions of these variables see Table 1).

The lack of statistical significance suggests that these variables did not have a significant impact on individuals' attitudes towards inter-ethnic marriages in the specific context of this research. While these variables may have importance in other aspects of individuals' lives or in different research contexts, they did not contribute significantly to explaining the variability in attitudes towards inter-ethnic marriages in the present study.

These findings indicate that factors such as age, gender, employment status, and social class may not be strong predictors of attitudes towards inter-ethnic marriages among the ethnic Bulgarian population in relation to the Turkish community. While these variables did not show a significant association in the current analysis, it is crucial to continue exploring other potential factors that may contribute to individuals' attitudes and behaviors.

By focusing on the variables/characteristics that have demonstrated statistical significance, policymakers, researchers, and stakeholders can develop more targeted strategies and interventions to address the key determinants influencing attitudes towards inter-ethnic marriages. Understanding the factors most influential in shaping these attitudes is essential for promoting social cohesion, diversity acceptance, and inclusivity in multicultural societies.

## Conclusions

In conclusion, this discussion has shed light on various aspects related to inter-ethnic marriages and their determinants. The analysis revealed that educational attainment plays a significant role in shaping attitudes towards inter-ethnic marriages. Contrary to expectations, higher levels of education did not necessarily lead to a more tolerant attitude, challenging some of the existing literature on the topic. Furthermore, the influence of income on attitudes towards inter-ethnic marriages was examined. It was found that individuals from wealthier households demonstrated higher levels of approval, suggesting a potential link between financial stability and openness towards inter-ethnic unions.

Geographical/territorial specifics also emerged as a crucial factor, with residents of the capital city, larger towns and villages exhibiting higher odds of approving inter-ethnic marriages compared to those living in small towns. This highlights the importance of considering the specific cultural and economic characteristics of different regions when studying attitudes towards inter-ethnic unions.

The models developed in this research, incorporating variables such as family status, settlement type, and educational attainment or income, provide predictive power in understanding individuals' attitudes towards interethnic marriages. These models demonstrate statistical significance and outperform baseline rates, offering a useful tool for predicting and managing tolerance levels.

It is worth noting the limitations of this study. The availability of data restricted the development of more comprehensive, better predictive, and powerful models, implying that the inclusion of external data is necessary, which is beyond the scope of this research. Additionally, further investigation is needed to understand the factors contributing to the higher odds of approval among widowed and divorced individuals, indicating a potential shift in their attitudes following the loss of a partner.

Despite these limitations, this research contributes to the growing body of knowledge on inter-ethnic marriages, providing insights into the socio-demographic determinants that shape attitudes in a specific context. The findings have implications for policymakers and stakeholders,

ISSN: 2149-1291

emphasizing the importance of education, income, and geographical/territorial level of urbanization specifics in fostering or hampering a more inclusive and tolerant society. Future studies should delve deeper into the underlying mechanisms driving attitudes towards inter-ethnic unions.

Understanding and promoting positive attitudes towards inter-ethnic marriages are essential for fostering social cohesion, embracing diversity and creating inclusive societies. By addressing the determinants identified in this research, policymakers and stakeholders can better develop targeted interventions and policies to promote cross-cultural understanding, reduce prejudice and facilitate harmonious intergroup relations.

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