

Athens Journal of Demography & Anthropology



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Front Pages

PORTIA SIMELANE & MICHAEL DZATOR

[Unpacking Gender-Based Violence in Australian Universities:
A Demographic Approach](#)

ANDREA GIORGI

[Designing Coexistence: Speculative Design and Social Innovation
within Degrowth Scenarios for 2045](#)

MARIA IRINI AVGOULAS

[Aging in Diaspora from the Eyes of the OG's: The Elderly Greek
Australians](#)

GREGORY T. PAPANIKOS

[Deportation Timing and Jewish Holocaust Survival in Greece:
Evidence from 23 Cities](#)

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Volume 2, Issue 3, September 2026
Download the entire issue ([PDF](#))

Front Pages i-viii

[Unpacking Gender-Based Violence in Australian Universities: A Demographic Approach](#) 121

Portia Simelane & Michael Dzator

[Designing Coexistence: Speculative Design and Social Innovation within Degrowth Scenarios for 2045](#) 143

Andrea Giorgi

[Aging in Diaspora from the Eyes of the OG's: The Elderly Greek Australians](#) 157

Maria Irini Avgoulas

[Deportation Timing and Jewish Holocaust Survival in Greece: Evidence from 23 Cities](#) 169

Gregory T. Papanikos

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The current issue is the third of the second volume of the *Demography & Anthropology* (AJDA), by the published by the [Literature Unit](#) of the **Athens Institute**. All papers are subject to Athens Institute's [Publication Ethical Policy and Statement](#).

Gregory T. Papanikos
President
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The [Languages and Linguistics Unit](#) of Athens Institute, will hold its 20th Annual International Conference on Languages & Linguistics, 5-10 July 2027, Athens, Greece sponsored by the [Athens Journal of Philology](#). The conference is soliciting papers (in English only) from all areas of languages, linguistics and other related disciplines. You may participate as stream organizer, presenter of one paper, chair a session or observer. Please submit a proposal using the form available (<https://www.atiner.gr/2027/FORM-LNG.doc>).

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Important Dates

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- Acceptance of Abstract: **4 Weeks after Submission**
- Submission of Paper: **7 June 2027**

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The Social Program Emphasizes the Educational Aspect of the Academic Meetings of Athens Institute.

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- Social Dinner
- Mycenae Visit
- Exploration of the Aegean Islands
- Delphi Visit

Conference Fees

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Important Dates

- Abstract Submission: **17 November 2026**
- Acceptance of Abstract: **4 Weeks after Submission**
- Submission of Paper: **17 May 2027**

Academic Member Responsible for the Conference

- **Dr. Barbara Zagaglia**, Head, [Anthropology & Demography Unit](#), Athens Institute & Associate Professor, Polytechnic University of Marche, Italy.

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- Ancient Corinth and Cape Sounion

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Unpacking Gender-Based Violence in Australian Universities: A Demographic Approach

By Portia Simelane* & Michael Dzator[‡]

This study investigates the rates and patterns of gender-based violence (GBV) among students at Australian universities. It uses data from the 2021 National Student Safety Survey (NSSS) and information from 39 universities. The research applies descriptive and inferential statistics, including chi-square analysis, to examine sexual harassment and assault rates based on gender and location. The results show a high and uneven prevalence of GBV. The Australian Capital Territory has the highest rates of sexual harassment at 21.8% and assault at 8.6%. Females are significantly more impacted, with clear gender differences seen at most institutions (harassment: $\chi^2 = 152.415$, $p < 0.001$; assault: $p < 0.05$). Risk tends to be focused in common campus areas, lecture theatres, and libraries, highlighting where vulnerability is greater. Although many students experience harmful incidents, there is limited awareness of how to report them or access available support services. The study stresses the importance of demographic and spatial factors in understanding GBV. It calls for combined efforts, such as embedding GBV education in the curriculum, improving reporting systems, and implementing specific prevention strategies. The findings highlight the need for ongoing research and changes within institutions to create safer and more inclusive university environments across Australia.

Keywords: gender-based violence, tertiary education, patterns, prevalence, support awareness

Introduction and Background

Gender-based violence (GBV) is violence against people based on their biological sex. It poses a major challenge for tertiary education systems around the world (Makhene 2022). According to Garcia-Moreno et al. (2006), one in three women will experience some form of abuse in their lifetime. The World Health Organization (WHO 2021) states that 27% of women have faced GBV or intimate violence by a non-partner during their lives. This violence not only harms individuals but also negatively affects the educational environment, creating fear and discrimination. Recently, awareness and advocacy for addressing GBV have grown. Still, many tertiary institutions struggle with how well they respond and the effectiveness of their existing policies (Anitha and Lewis 2018, Khalajabadi-Farahani 2025).

This urgent issue not only threatens the safety of students but also greatly affects their mental health and academic performance. Research shows that GBV creates major challenges for the safety, dignity, and academic success of students in colleges and universities (Forbes-Mewett & McCulloch 2016, Makhene 2022).

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Even with a noticeable rise in awareness and policy changes in recent years, the rates of GBV in educational institutions remain alarmingly high, especially in diverse socio-cultural settings like Australia (Connell 2020, Beyene et al. 2019, Makhene 2022).

GBV has been called a crisis in Australia because the rates have increased over the years. The Australian Bureau of Statistics (ABS 2021) reported that 8 million Australians have faced physical or sexual harassment since they turned 15. The numbers for intimate partner violence are even worse for women. A total of 27% of women have experienced physical or sexual violence since the age of 15, while the figure is 12% for men (ABS 2021). In Australian universities, one in two students has experienced sexual harassment at least once in their lifetime. For female students, this number rises to 62.9% (Heywood et al. 2022). Research in other countries, like Nigeria and Ethiopia, shows GBV rates between 42.3% and 67.7% in educational institutions (Beyene et al. 2019). The high number of GBV cases among students calls for immediate action.

In several African countries, young females often face specific forms of treatment that can impact their rights, opportunities, and well-being. These practices may include gender-based discrimination, limited access to education, early marriage, and restricted participation in social and economic activities. Addressing these issues is crucial to promoting equality and improving the quality of life for young women across the continent (Ibor et al. 2025).

In South African universities, research on various forms of GBV showed that 56.5% experienced emotional or verbal abuse, 46.7% faced sexual assault, and 36.3% suffered physical violence. Additionally, 36.7% reported attempted rape, and 28.9% confirmed rape (Mutinta 2022). Multiple studies have documented the prevalence of GBV in South African universities. Many victims choose not to report incidents because of stigma, fear of not being believed, and poor responses from institutions (Mavhandu-Mudzusi 2018). To prevent this ongoing issue, universities should implement measures to protect and support students.

In Australian higher education, rates of gender-based violence (GBV) have been rising rapidly. This trend is negatively affecting students' health and wellbeing. The 2021 National Student Safety Survey found that one in twenty students experienced sexual assault, and one in six faced sexual harassment during their university studies (Nisbet et al. 2022). University managers are aware of the consequences of GBV, which include unwanted pregnancy, depression, anxiety, and sexually transmitted diseases. Furthermore, Burke et al.'s (2025) findings on the impacts of gender-based violence on the experiences of university students revealed that students suffered educational disruptions resulting from being forced to withdraw from their unit of study due to an inability to cope after this harm. Additionally, some students faced lengthy delays in completing their studies because of the complicated process of withdrawing and re-enrolling took years and in some cases decades to complete (Burke et al. 2025).

However, they continue to neglect the protection and support of students (Australian Human Rights Commission 2017). Instead, universities often overlook and silence GBV victims by providing limited resources to address the issue. They also fail to take action when they are informed that a student has been sexually assaulted (Schloeffel et al. 2025). In recent years, research conducted in Australian

Higher Education revealed shocking increasing rates of Gender Based Violence (Australian Government 2026). University staff and students reported that they were unaware of where to seek support or report formally in the event that they are victims of gender-based violence; and those who knew where to report were not happy with the process involved in this (Australian Government 2025). In an attempt to address this challenge, in January 2026 the Australian Government implemented the National Higher Education Code to Prevent and Respond to Gender-based Violence (Australian Government 2026). This Code provide institutions of higher learning with a reliable framework of standards and requirements aiming at reducing the incidence of gender-based violence, prioritise safety, improve prevention efforts, improving responses to gender-based violence and ensure providers accountability in ensuring students safety, including in students' accommodation (Australian Government 2026). This National Code has legal implications and thus, non-compliance may result in regulatory action which involves serious financial fines (Australian Government 2026).

Australia consists of six states and two territories, with 39 universities spread across these regions. Gender-based violence (GBV) is a serious problem in Australia, affecting people from various backgrounds. According to recent data, 2 in 5 women (29%) and 2 in 5 men (43%) over the age of 15 have faced at least one instance of violence (ABS 2021). Regarding sexual harassment, 2 in 5 women (22%) and 1 in 16 men (6.1%) have encountered it since turning 15 (ABS 2021). The high rates of GBV in Australian communities demand immediate action. Universities in Australia have recently recognised the extent of GBV on their campuses. Reports indicate that many students, particularly women, have dealt with harassment and assault (Australian Human Rights Commission, 2017). The first national survey of university students conducted in 2016 revealed the prevalence of sexual violence (Australian Human Rights Commission, 2017). A follow-up survey in 2021 among 39 universities confirmed these findings regarding the prevalence of GBV on campus (Heywood et al. 2022). The 39 Australian universities have rolled out several plans and initiatives to tackle this crisis (Henry 2024).

GBV shows up in many forms, including sexual harassment and sexual assault. In a study by Nisbet et al. (2022) involving university students in Australia, participants reported sexual harassment through inappropriate touching, sexist comments, stalking, unwanted kissing, and sexualized remarks. Sexual assault involves being forced to engage in sexual activity or being pressured to continue after withdrawing consent (Nisbet et al. 2022). Common forms of GBV in educational settings include sexual harassment, intimate partner violence, and stalking (Banyard et al. 2020). In terms of the effects of GBV, Burke et al. (2022) discovered that intimate partner violence was the most damaging type and presented various challenges for impacted students in terms of their participation in higher education. These experiences are not only frequent but also heavily influenced by gender, with marginalized communities facing greater risks (Silva et al. 2022). Australia offers a unique context for studying GBV. The landscape of GBV in higher education has been shaped by national surveys and policy changes aimed at tackling the issue. For example, the Australian Human Rights Commission (2017) highlighted alarming rates of sexual assault and harassment in universities. This report sparked a national reaction, motivating institutions to improve their policies and support services.

Gender based violence has a lasting negative impact on both staff and students in Higher Education in Australia. A study that was conducted in Australia and England universities with the aim of investigating the effects of gender-based violence reported that GBV is strife among university staff members and has become the norm in universities' management (Jackson and Gray 2026). The results from this study revealed that Australian universities are dangerous workplaces for women, especially those from previously marginalised groups such as Aboriginal and Torres Strait Islander People (Jackson and Gray 2026). In addition, GBV is not only experienced by women but is also experienced by men and people who identify as non-binary or with another gender identity (Humbert and Strid 2025).

In support of this, GBV negatively affects students' sense of identity, resulting in perceiving themselves to be different from others and feeling like an outsider (Burke et al. 2022). In Australia, a study that was conducted by Burke et al. (2022) on the impact of gender-based violence on students' participation and a sense of belonging reported that GBV results in on-going stress, loss of self-esteem, shame and loss of one's sense of confidence and capability.

Research on students' knowledge of where to report GBV cases and their awareness of available support in higher education has been troubling. Many students who are victims of GBV said they do not know where to report their cases or find help (Nisbet et al. 2022). Additionally, some students mentioned that after reporting their cases, they did not receive the timely response they needed. This led some students to choose not to report GBV incidents, as they felt that their university system had completely failed them (Nisbet et al. 2022).

A study involving five countries investigated students' experiences, knowledge, and confidence regarding gender-based violence (GBV) issues and concluded that students felt unprepared to handle these situations because their courses did not fully equip them (Bradbury-Jones et al. 2021). The study suggested that universities should include GBV topics in their curriculum to better prepare students for this issue (Bradbury-Jones et al. 2021). In support of this, findings from a study conducted by Coffey et al. (2023) among Australian university students argued that gender-based violence should be considered an equity issue due to its impacts on students' academic progress, high stress levels and anxiety.

Additionally, research has pointed out how institutional culture affects the reporting and support systems for GBV survivors (Henry et al. 2020). In Australia, many universities are working to raise awareness and encourage reporting. However, challenges still exist in making sure these programs are effective and reach all students (Henry et al. 2020). Students in Australian higher education have reported several obstacles to reporting GBV cases. They include a lack of understanding of what constitutes sexual assault and harassment, which affects when they report, slow response times for reported cases, and unclear policies and systems for educating, supporting, and reporting GBV cases (Nisbet et al. 2022). This situation calls for universities to urgently tackle these issues to ensure students' safety on campuses.

The existing literature highlights the need for a way to understand GBV in tertiary institutions. By examining the prevalence, patterns, and students' awareness of GBV support at Australian universities, we can gain important insights that will help develop effective policies and improve institutional practices. Ultimately, addressing GBV in

educational settings is crucial for creating a fair and inclusive academic environment for all students. Specifically, we address the following research questions:

1. What are the rates and types of gender-based violence in higher education institutions across Australia? How do these rates vary by gender and location?
2. How knowledgeable are students in Australian universities about support services and their options for seeking help with GBV?
3. How consistent and transparent are Australian universities in publicly reporting sexual violence incidents, disclosures, and institutional responses on their official websites?

In addressing these research questions, this study offers three main contributions to academic knowledge and policy by examining each university individually and conducting quantitative analyses to present findings not included in the NSSS report (Heywood et al. 2022). First, this study enhances understanding by providing evidence on the prevalence of GBV in Australian universities. The analysis of GBV rates shows how incidents differ by gender and geographic location on campuses. Second, it investigates whether students know about support services and where to seek help for dealing with GBV in university settings. This study will help assess how aware students are regarding reporting and seeking help. Third, the study highlights significant inconsistencies and gaps in the public reporting of sexual violence data by Australian universities. This research emphasises the urgent need for standardised, reliable reporting to improve transparency and accountability in higher education.

The findings are important for informing policymakers and university officials who want to create and maintain a safer and more supportive environment for addressing GBV in universities.

The rest of the paper is organised as follows:

- *Section 2: Methodology* — This section describes the methods and procedures used to conduct the research, providing a clear explanation of the steps taken and their rationale.
- *Section 3: Results and Discussion* — Here, we present the findings of our research and offer an in-depth discussion that interprets the results in the context of the research questions and contributions.
- *Section 4: Limitations* — This section outlines the limitations encountered during the research and addresses any constraints that may affect the interpretation or generalisability of the results.
- *Section 5: Conclusion and Recommendations* — In the final section, we summarise the main findings, draw conclusions, and offer recommendations based on the research outcomes.

Methodology

Overview

The study investigated how common sexual harassment and sexual assault are at universities in Australia and used a method that involved systematic data collection, an in-depth analysis of infographics, and advanced statistical modelling such as logistic regression in order to gain a thorough understanding of these matters.

Data Collection

We carried out a systematic review of the official websites of all 39 Australian universities that took part in the National Student Safety Survey (Heywood et al. 2022). The main source of data was the infographics available on each university's website, since these infographics give a summary of the survey's key results. For each institution, we carefully extracted and arranged the relevant information concerning sexual harassment and sexual assault to guarantee consistency and accuracy.

Infographic Analysis

From the infographics, we identified and recorded several key variables:

- The total amount of students who have been sexually harassed or sexually assaulted since the start of their studies.
- The number of such incidents that have taken place over the last 12 months.
- The locations on campus most frequently associated with sexual harassment, with a focus on the three main ones at each university.
- The difference in prevalence between genders about sexual harassment and sexual assault over the past year.
- The percentage of students who are aware of the reporting options and support services.

We also looked at the way each university gave information online regarding reporting and support services, judging the information on the grounds of its accessibility, clarity, and completeness.

Sample Size and Demographics

The number of students included in each sample differed, with the smallest number coming from Bond University (452 students) and the largest from the biggest university (1,775 students). Since more than 60% of the universities had samples consisting of over 1,000 students, this lends support to the idea that the findings are representative. Moreover, we looked at demographic data, focusing especially on gender, to put the results in context and to point out any differences in the experiences or way of reporting between male and female students.

Data Organisation

The data extracted were put together in Microsoft Excel so that they could be analysed systematically. The percentages given in the infographics were transformed into actual figures for the students by using the sample size of each university, which then allowed for an accurate estimate of the number of students in each category. For comparing the subgroups, for monitoring trends over time, and for checking the results for accuracy, the Excel tools were employed.

Statistical Analysis

The data were analysed using SPSS software (version 32) and Microsoft Excel. Descriptive statistics were used to summarise the demographic and incident data, and chi-square tests were carried out to examine the associations between gender and the experiences of sexual harassment or assault, while the status of the universities in terms of their harassment and assault rates was determined.

Logistic Regression Analysis

To find out which factors affect the chances of experiencing sexual harassment, we used logistic regression analysis. This method calculated the odds of an individual being affected according to factors such as gender. The model produced adjusted odds ratios together with confidence intervals thus giving a detailed evaluation of the risk factors while considering any possible confounding variables.

Results and Discussion

Results

Sexual Harassment and Sexual Assault

Table 1a. *Sexual Harassment Rates at Australian Universities Above (A) and Below (B) the National University Average (16.1%) Since Enrolment*

Status	University	Sexual Harassment 1 %
1 (A)	Australian National University	26.1
2 (A)	Bond University	25.0
3 (A)	James Cook University	22.2
4 (A)	University of Western Australia	21.4
5 (A)	Queensland University of Technology	20.4
6 (A)	Griffith University	20.2
7 (A)	University of Queensland	19.3
8 (A)	University of Adelaide	19.3
9 (A)	Notre Dame University	19.2
10 (A)	La Trobe University	18.9
11 (A)	Macquarie University	18.6
12 (A)	University of Melbourne	18.5
13 (A)	Murdoch University	18.5

14 (A)	University of Wollongong	18.5
15 (A)	University of Sydney	18.5
16 (A)	University of Newcastle	17.9
17 (A)	University of Canberra	17.5
18 (A)	Flinders University	17.3
19 (A)	University of Tasmania	16.9
20 (A)	University of Sunshine Coast	16.8
21 (B)	Charles Sturt University	16.0
22 (B)	Curtin University	15.6
23 (B)	Monash University	15.3
24 (B)	University of New England	15.0
25 (B)	Edith Cowan University	14.3
26 (B)	University of Technology Sydney	13.8
27 (B)	Western Sydney University	13.5
28 (B)	University of New South Wales	12.9
29 (B)	Swinburne University	12.6
30 (B)	Sothorn Cross University	12.4
31 (B)	Charles Darwin University	12.3
32 (B)	University of South Australia	12.1
33 (B)	Deakin University	11.9
34 (B)	Australia Catholic University	11.0
35 (B)	Victoria University	11.0
36 (B)	RMIT University	10.5
37 (B)	Federation University	10.2
38 (B)	University of Southern Queensland	10.1
39 (B)	Central Queensland University	9.1

Table 1b. *Sexual Harassment Rates at Australian Universities Above (A) and Below (B) the National Average (8.1%) in the Past 12 Months*

Status	University	Sexual Harassment 2 %
1 (A)	Bond University	20.6
2 (A)	University of Western Australia	14.8
3 (A)	Australia National University	14.5
4 (A)	James Cook University	13.8
5 (A)	University of Adelaide	13.0
6 (A)	Griffith University	12.8
7 (A)	Murdoch University	11.9
8 (A)	Queensland University of Technology	11.8
9 (A)	Notre Dame University	11.5
10 (A)	University of Sunshine Coast	11.2
11 (A)	Flinders University	11.2
12 (A)	University of Queensland	11.0
13 (A)	University of Canberra	10.2
14 (A)	Macquarie University	9.9
15 (A)	University of Wollongong	9.6
16 (A)	University of Sydney	9.5
17 (A)	University of Newcastle	9.3
18 (A)	Curtin University	9.2
19 (A)	University of Tasmania	8.6
20 (A)	La Trobe University	8.5
21 (A)	Edith Cowan University	8.2
22 (B)	University of Melbourne	7.5
23 (B)	Monash University	7.3

24 (B)	University Technology Sydney	7.2
25 (B)	Charles Sturt University	7.1
26 (B)	University of South Australia	7.1
27 (B)	Australian Catholic University	5.8
28 (B)	University of New South Wales	5.8
29 (B)	Western Sydney University	5.3
30 (B)	Southern Cross University	5.2
31 (B)	Charles Darwin University	4.6
32 (B)	Deakin University	4.5
33 (B)	Victoria University	4.0
34 (B)	University of Southern Queensland	3.8
35 (B)	Central Queensland University	3.8
36 (B)	University of New England	3.8
37 (B)	Swinburne University	3.7
38 (B)	Federation University of Australia	3.6
39 (B)	RMIT University	3.0

Table 1a shows that the Australian National University (ANU) has the highest percentage of sexual harassment, at 26.1%. A total of 430 students experienced harassment at ANU. The five universities with the highest rates of harassment are ANU, Bond University, James Cook University, the University of Western Australia, and Queensland University of Technology (QUT). All five institutions have percentages above 20%. The actual numbers from the study's sample size are ANU (430), University of Western Australia (370), University of Notre Dame (274), University of Melbourne (274), and University of Adelaide. Central Queensland University (CQU) has the lowest percentage of harassment incidents. However, in actual numbers, the bottom five universities, based on the sample size, are: RMIT (70), Southern Cross University (91), Federation University Australia (92), Victoria University (98), and Central Queensland University (104), since the beginning of the university.

Table 1b also shows the percentage of reported harassment at different universities over 12 months based on data collected in 2021. Bond University, with 20.6% (93), has the highest reported harassment. The actual number of harassed students, based on the sample size, includes the University of Western Australia (256), Australian National University (ANU) (204), Notre Dame (165), Murdoch University (162), and James Cook University (162). RMIT had 20 harassed students over 12 months, representing the lowest number.

The top 20 universities have rates above the national average of 16.1% (CDU 2022, Heywood et al. 2022), while 19 universities fall below the average, as shown in Table 1a. Similarly, as in Table 1b, for students who have experienced sexual harassment in the past 12 months, 21 universities are above the national average of 8.1% (CDU 2022, Heywood et al. 2022), while 18 universities are below.

Tables 2a and 2b highlight the percentages of sexual assault since starting university and over 12 months. These results show differences in student safety across the universities. Bond University reported the highest rate of sexual assault at 13.2%. The top five universities with the highest rates of sexual assault, based on the sample size, are: ANU (203), the University of Western Australia (119), the University of New England (117), James Cook University (112), and Notre Dame (89). In the 12 months, as shown in Table 2b, Bond still has the highest percentage for sexual assault. The top

five universities in terms of the actual number of sexual assaults, based on the sample size, are ANU (74), University of Western Australia (55), Bond University (42), James Cook University (39), and Notre Dame (28).

RMIT, Victoria University, Charles Darwin University (CDU), Deakin University, and Swinburne University did not record any data on sexual assault over the past 12 months.

Of the 39 universities as shown in Table 2a for assault since starting university, the assault rates of 18 universities are above the national average of 4.5% (CDU 2022, Heywood et al. 2022), while of the 32 universities that have reported cases of sexual assault in the past 12 months, 20 universities' assaults rates are above the national average of 1.1% (Heywood et al. 2022).

Table 3 shows the average rate of sexual harassment among university students in each state and territory since they began their studies. The two universities in the ACT have the highest average at 21.80%. Following that are the five universities in Western Australia, with an average of 17.94%. Queensland is next with an average of 17.30% across its nine universities. Tasmania has only one university, so its reported rate of 16.90% is not an average, but it places fourth. South Australia and New South Wales take the 5th and 6th positions, respectively. The Northern Territory has only one university and reports a rate of 12.40%, which is lower than the other states.

Table 3 also shows that the Australian Capital Territory reported the highest rate at 8.60% for sexual assault. Tasmania follows with a rate of 5.70%, marking it as the only university with this figure. Queensland is third with a rate of 5.44%. Bond University reported a high figure for sexual assault, which may have influenced the high rate in Queensland. New South Wales comes in fourth with a rate of 5.39%. This is followed by Western Australia at 4.20% and the Northern Territory at 3.80%, which is the figure for one university. South Australia has the lowest rate, sitting at 3.37%. The results are also presented in Figure 1.

Table 2a. *Sexual Assault Rates at Australian Universities Above (A) and Below (B) the National Average (4.5%) Since Enrolment*

Status	University	Sexual Assault 1 %
1 (A)	Bond University	13.2
2 (A)	Australian National University	12.3
3 (A)	James Cook University	9.5
4 (A)	University of New England	7.6
5 (A)	Charles Sturt University	7.4
6 (A)	University of Western Australia	6.9
7 (A)	University of Sydney	6.7
8 (A)	University of Newcastle	6.0
9 (A)	University of Wollongong	6.0
10 (A)	University of Tasmania	5.7
11 (A)	University of Melbourne	5.5
12 (A)	Monash University	5.1
13 (A)	University of Queensland	5.0
14 (A)	Notre Dame University	5.0
15 (A)	Macquarie	5.0
16 (A)	University of Canberra	4.9
17 (A)	La Trobe University	4.7
18 (A)	Griffith University	4.6
19 (B)	Queensland University of Technology	4.3

20 (B)	Curtin University	4.2
21 (B)	Southern Cross University	4.1
22 (B)	University of Adelaide	4.0
23 (B)	University of Technology Sydney	4.0
24 (B)	Flinders University	4.0
25 (B)	Charles Darwin University	3.8
26 (B)	Deakin University	3.7
27 (B)	University of Sunshine Coast	3.4
28 (B)	Swinburne University	3.3
29 (B)	University of New South Wales	3.2
30 (B)	University of Southern Queensland	2.9
31 (B)	Murdoch University	2.9
32 (B)	RMIT University	2.8
33 (B)	Western Sydney University	2.6
34 (B)	Australian Catholic University	2.5
35 (B)	Victoria University	2.5
36 (B)	University of South Australia	2.1
37 (B)	Edith Cowan University	2.0
38 (B)	Central Queensland University	2.0
39 (B)	Federation University Australia	1.9

Table 2b. Sexual Assault Rates at Australian Universities at and Above (A) and Below (B) the National Average (1.1%) in the Past 12 Months

Status	University	Sexual Assault 2 %
1 (A)	Bond University	9.3
2 (A)	Australian National University	4.5
3 (A)	James Cook University	3.3
4 (A)	University of Western Australia	3.2
5 (A)	University of Newcastle	2.8
6 (A)	Griffith University	2.6
7 (A)	University of Wollongong	2.1
8 (A)	Charles Sturt University	1.9
9 (A)	University of Canberra	1.7
10 (A)	University of Queensland	1.6
11 (A)	Notre Dame University	1.6
12 (A)	University of Technology Sydney	1.6
13 (A)	University of Sydney	1.5
14 (A)	University of Adelaide	1.4
15 (A)	Macquarie University	1.4
16 (A)	University of Melbourne	1.3
17 (A)	University of Sunshine Coast	1.2
18 (A)	Curtin University	1.1
19 (A)	University of Tasmania	1.1
20 (A)	University of New England	1.1
21 (B)	La Trobe University	1.0
22 (B)	Murdoch University	1.0
23 (B)	Flinders University	1.0
24 (B)	Queensland University of Technology	0.9
25 (B)	Edith Cowan University	0.7
26 (B)	Monash University	0.7
27 (B)	Central Queensland University	0.7
28 (B)	Southern Cross University	0.6
29 (B)	University of New South Wales	0.6

30 (B)	Australian Catholic University	0.5
31 (B)	University of South Australia	0.5
32 (B)	Federation University Australia	0.4
33 (B)*	RMIT University	-----
34 (B)*	Victoria University	-----
35 (B)*	Charles Darwin University	-----
36 (B)*	Deakin University	-----
37 (B)*	Swinburne University	-----
38 (B)*	University of Southern Queensland	-----
39 (B)*	Western Sydney University	-----

*There are no assault values.

Table 3. *SH and SASlt Percentage since Starting University in States or Territories*

Status	State/Territory	Average Percentage (Sexual Harassment)	Status	State/Territory	Average Percentage (Sexual Assault)
1	Australia Capital Territory	21.80	1	Australia Capital Territory	8.60
2	Western Australia	17.94	2	*Tasmania	5.70
3	Queensland	17.30	3	Queensland	5.44
4	*Tasmania	16.90	4	New South Wales	5.39
5	South Australia	16.30	5	Western Australia	4.20
6	New South Wales	16.27	6	**Northern Territory	3.80
7	Victoria	13.68	7	Victoria	3.69
8	**Northern Territory	12.40	8	South Australia	3.37

*Average for only one university in a state.

**Average for only one university in a state.

Figure 1. *Sexual Harassment (SH) and Sexual Assault (SASLT) Percentage since Starting University in States and Territories*

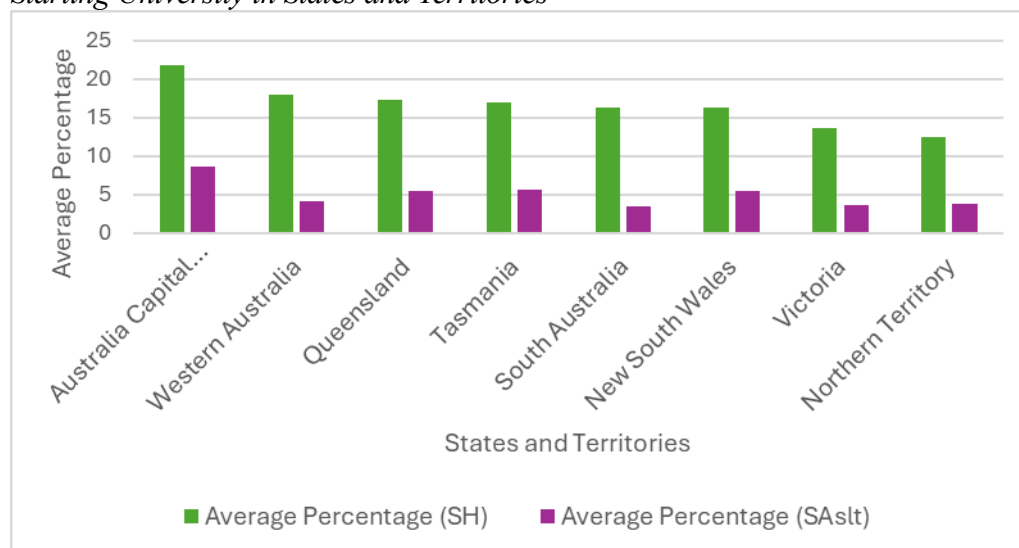
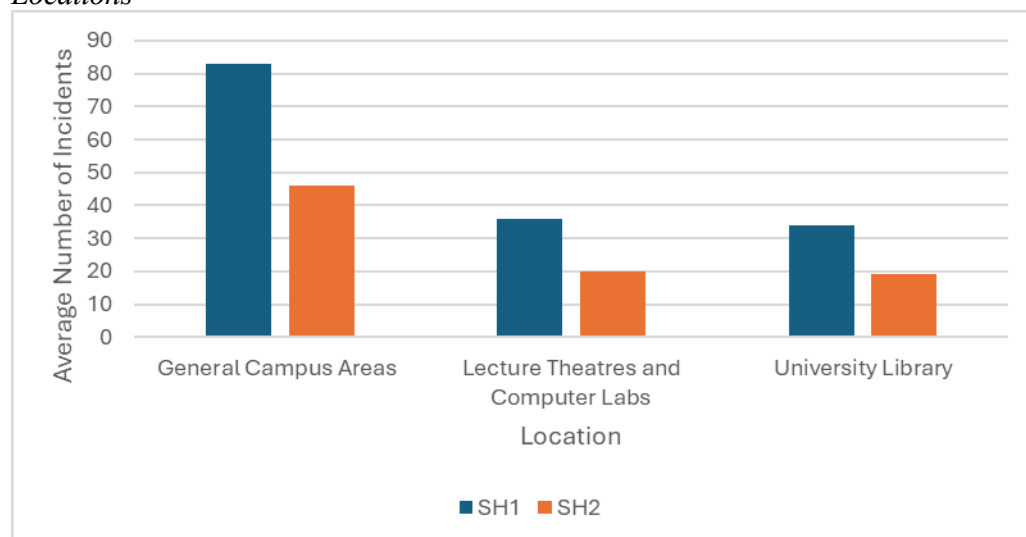


Table 4. Average Number of Sexual Harassment since Starting University (SH1) and 12 Months (SH2)

	Top three Locations for 23 Universities		
Period	General Campus Areas	Lecture Theatres and Computer Labs	University Library
SH1	83	36	34
SH2	46	20	19

Table 4 shows the average number of sexual harassment incidents reported by students in three areas across 23 universities in Australia. The comparison includes incidents since the start of university (SH1) and those in the last 12 months (SH2), based on data collected in 2021. The results indicate that General Campus Areas have the highest number of sexual harassment cases for both periods, with 83 incidents for SH1 and 46 for SH2. Following this are the incidents in Lecture Theatres and Computer Labs, with averages of 36 and 20 incidents, respectively. University Libraries are close behind, showing averages of 34 and 19 incidents for SH1 and SH2, respectively. Figure 2 also presents these results.

Figure 2. Average Number of Sexual Harassment for SH1 and SH2 in the Three Top Locations**Table 5a.** Chi-Square Results

GBV Measure – Harassment and Assault	Number of Universities	Chi-Square Value	df	Cramer's V	p-value
1. Sexual Harassment and Gender	36	152.415	1	0.144	<0.001**
2. Sexual Assault and Gender	8	3.360	1	0.079	0.067
3. Sexual Assault and Gender	28	4.045	1	0.061	0.044*

*P<0.05 , **P<0.01

The Chi-Square value given in the first row of Table 5a is 152.415 having one degree of freedom ($df = 1$) and is based on data from 36 universities. Cramer's V for this case is 0.144 and the p-value is less than 0.001. This shows that there is a statistically significant association between gender and the experiences of sexual harassment at these universities. Yet the Cramer's V value of 0.144 shows that even though the relationship is statistically significant, it is weak in terms of strength. The Chi-Square value given in the second row is 3.360 (with 1 degree of freedom) for a group of 8 universities. These are the universities which supplied complete data regarding both female and male students who had experienced sexual assault in the previous 12 months. Here, the p-value is 0.067 and Cramer's V is 0.079. The findings indicate that there is no statistically significant association between gender and sexual assault at these universities. The third analysis includes 28 universities where complete data were not supplied for both male and female students who have been assaulted; in this case, the Chi-Square value is 4.045 (with 1 degree of freedom), the p-value is 0.044, and Cramer's V is 0.061. There is therefore a statistically significant association between gender and sexual assault among this group. Yet the Cramer's V value shows that the strength of this association is very weak. The data gathered from eight universities covered detailed information regarding both female and male students who had experienced sexual assault in the previous 12 months. In the case of the bigger group of 28 universities, however, complete data for both genders were not provided. Even though the incomplete data represented a limitation, the analysis was still carried out with all the available information to make the best possible use of the data available.

Table 5b. *Logistic Regression Analysis of Relationship between Sexual Harassment and Gender*

Independent	Variables in the Equation						95% C.I for Exp(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Gender			1557.601	2	< 0.001			
Gender (1)	2.447	0.085	825.078	1	< 0.001	11.555	9.778	13.655
Gender (2)	4.818	0.122	1556.929	1	< 0.001	123.769	97.424	157.238
Constant	1.214	0.067	323.952	1	< 0.001	3.368		

The findings from a logistic regression analysis examining the relationship between gender and experiences of sexual harassment are given in Table 5b. The results show that women are 11.6 times more likely than men to experience sexual harassment, and this figure is accurate since the 95% confidence interval is relatively narrow, extending from 9.78 to 13.66. People who have been classified as 'other gender', such as transgender, non-binary, and other similar identities, are at an even higher risk, the odds of them suffering sexual harassment being about 124 times greater than those for men. This finding is highly statistically significant ($p < 0.001$) and the 95% confidence interval for this group ranges from 97.42 to 157.24. The constant value ($\text{Exp}(B) = 3.368$) represents the odds of members of the reference group (males) being subjected to sexual harassment when all the other variables in the model are at their baseline levels.

Report and Support Seeking

Table 6 provides an overview of sexual harassment and assault report and support awareness across 39 universities, using six indicators as follows:

- **UCSH:** University Complaints on Sexual Harassment
- **USSH:** University Support for Sexual Harassment
- **UWCSH:** Unsure Where to Complain about Sexual Harassment
- **UASH:** Unaware of Support for Sexual Harassment
- **UWRSAs:** Unaware of Where to Report Sexual Assault
- **LKSAs:** Lack Knowledge about Support for Sexual Assault

The values for sexual harassment reveal differences in formal complaints and in seeking help within the university setting. For instance, the University of Southern Queensland and Deakin University have higher complaint rates, at 7.9% and 6.7%, respectively. In contrast, the University of New South Wales (UNSW) and the University of Melbourne have lower complaint rates of 3.5% and 1.9%. Curtin University, the University of Tasmania, the University of the Sunshine Coast, Western Sydney University, RMIT University, La Trobe University, Swinburne University, the University of South Australia, and the University of Sydney did not provide any percentage values for formal complaints.

Although most students do not know where to find help or how to file a complaint, some universities stand out. Charles Sturt University has 25% of its students seeking support, while the University of Wollongong has 24.1%.

The percentage values for sexual assault are listed in the last two columns of Table 6. In terms of awareness about where to report sexual assault, a significant number of students from the University of Western Australia (63.1%) and Australia Catholic University (61.1%) do not know where to report sexual assault. Other universities with high levels of unawareness include Queensland University of Technology and Griffith University, with percentages of 60.7% and 60.2%. The levels of unawareness regarding where to seek support for sexual assault are as follows: the top three universities are the University of Western Australia (51.9%), RMIT University (51.8%), and Queensland University of Technology (51.4%).

Table 7 shows the availability and consistency of data on sexual violence reports, disclosures, and institutional responses from the websites of 39 Australian universities. All the universities listed claim to provide this information on their official websites, marked by "Yes." However, an asterisk (*) next to several universities indicates that some data is available, but it is not consistently updated or regularly reported. This leads to important gaps in the information that the public can access. Nearly half of the institutions listed face this inconsistency, which points to ongoing issues with transparency and reporting practices in higher education.

The table shows that out of 39 Australian universities, 22 have an asterisk (*) next to 'Yes'. This indicates that their websites do not consistently provide regular updates or reports on incidents of sexual violence. Approximately 56% (22 out of 39) of universities have gaps or inconsistencies in their public reporting. The remaining 44% (17 out of 39) of universities share data on sexual violence reports,

disclosures, and responses on their websites without an asterisk. This suggests they offer more consistent and regular updates.

Table 6. *Sexual Harassment and Assault Reporting & Support Awareness at Australian Universities*

University	UCSH	USSH	UWCSH	UASH	UWRSAs	LKSAs
1. University of Queensland	2.1	17.5	47.5	42.6	51.7	39.3
2. Curtin University of Technology	----	10.6	55.6	51.7	58.6	49.6
3. Southern Cross University	5.5	22.3	55.0	50.4	58.7	47.3
4. Griffith University	2.9	18.9	56.9	53.9	60.2	49.7
5. Notre Dame University	4.4	14.1	44.2	38.6	47.1	34.4
6. Australian Catholic University	2.6	16.5	57.4	52.2	61.1	48.4
7. Edith Cowan University	2.7	11.6	46.2	42.6	49.3	38.5
8. Federation University Australia	3.7	16.5	43.0	39.0	45.6	34.3
9. University of Adelaide	3.1	17.4	47.0	42.3	50.3	37.5
10. University of Melbourne	1.9	20.7	56.5	51.5	59.3	46.5
11. University of Southern Queensland	7.9	21.2	46.1	44.1	48.8	42.6
12. University of Western Australia	3.4	15.1	59.8	55.8	63.1	51.9
13. University of Canberra	2.8	16.9	47.0	41.6	49.6	40.0
14. University of Tasmania	----	17.7	50.3	47.1	53.6	45.7
15. University of Sunshine Coast	----	18.3	35.5	32.2	38.9	29.7
16. Western Sydney University	----	17.2	49.7	47.9	55.2	46.4
17. University of Newcastle	4.2	11.1	46.6	39.1	50.1	36.3
18. Charles Sturt University	3.8	25.0	50.4	47.9	53.4	45.0
19. Macquarie University	2.7	10.6	45.0	41.1	47.4	38.7
20. RMIT University	----	14.0	57.3	52.7	59.3	51.8
21. Victoria University	4.7	24.0	54.3	50.8	56.7	49.5
22. La Trobe University	----	15.3	52.0	48.5	55.1	43.5
23. Murdoch University	4.4	12.4	57.1	51.1	59.7	45.6
24. Queensland University of Technology	2.8	12.7	58.4	54.9	60.7	51.4
25. University of Wollongong	5.5	24.1	53.9	48.0	55.9	45.2
26. University Technology Sydney	2.5	16.2	41.0	36.0	42.3	29.2
27. Charles Darwin University	4.2	21.4	50.8	48.6	53.3	43.4
28. Monash University	2.7	19.9	46.7	41.0	48.0	37.8
29. Bond University	3.6	19.6	39	34.8	40.6	33.5
30. Central Queensland University	2.1	11.5	44.1	41.5	47.4	39.0
31. Deakin University	6.7	17.7	46.9	43.7	50.3	41.2
32. Flinders University	3.6	14.0	46.4	41.7	49.1	36.9
33. James Cook University	3.1	22.6	37.1	33.4	38.3	29.8
34. Swinburne University	----	19.2	52.3	47.8	54.4	43.9
35. University of New South Wales	2.1	16.2	52.0	49.3	54.0	45.9
36. University of South	----	11.3	55.9	52.7	58.7	49.7

Australia						
37. University of Sydney	----	17.0	55.1	47.6	56.9	47.3
38. Australian National University	3.3	18.6	48.3	41.5	48.5	36.9
39. University of New England	2.8	19.7	49.4	46.2	51.1	44.0

Column 2. UCSH – University Complaints on Sexual Harassment

Column 3. USSH – University Support for Sexual Harassment

Column 4. UWCSH – Unsure Where to Complain about Sexual Harassment

Column 5. UASH – Unaware of Support for Sexual Harassment

Column 6. UWRSAs – Unaware of Where to Report Sexual Assault

Column 7. LKSAs – Lack Knowledge about Support for Sexual Assault

Table 7. *Sexual Violence Reporting Data on Australian University Websites*

University	Sexual Violence Reports and Responses on University Websites
1. Australian Catholic University	Yes
2. Australian National University	Yes
3. University of Notre Dame	Yes*
4. University of Canberra	Yes*
5. Charles Sturt University	Yes*
6. Macquarie University	Yes
7. Southern Cross University	Yes*
8. University of New England	Yes*
9. University of Newcastle	Yes*
10. University of Sydney	Yes
11. University of Technology Sydney	Yes
12. University of Wollongong	Yes
13. University of New South Wales	Yes
14. University of Western Sydney	Yes*
15. Charles Darwin University	Yes*
16. Bond University	Yes
17. Central Queensland University	Yes*
18. Griffith University	Yes
19. James Cook University	Yes*
20. Queensland University of Technology	Yes*
21. University of Queensland	Yes*
22. University of Southern Queensland	Yes*
23. University of Sunshine Coast	Yes
24. Flinders	Yes*
25. University of Adelaide	Yes*
26. University of South Australia	Yes*
27. University of Tasmania	Yes
28. Deakin University	Yes
29. Federation University	Yes*
30. La Trobe University	Yes
31. Monash University	Yes
32. RMIT University	Yes*
33. Swinburne University	Yes
34. University of Melbourne	Yes
35. Victoria University	Yes*
36. Curtin University	Yes

37. Edith Cowan University	Yes *
38. Murdoch University	Yes*
39. University of Western Australia	Yes*

*The university's website has failed to provide consistent updates or reports on sexual violence incidents, leading to gaps in publicly available information.

Discussion

The results of this study show that the Australian National University (ANU) has the highest proportion of sexual harassment, amounting to 26.1 per cent, 430 students having experienced harassment at ANU. Likewise, Bond University, James Cook University, the University of Western Australia, and the Queensland University of Technology (QUT) all have sexual harassment rates above 20 per cent. These findings demonstrate that sexual harassment is a widespread problem in several Australian universities, supporting the patterns that have been reported in recent national studies (CDU 2022, Heywood et al. 2022). Furthermore, Bond University also has the highest rate of reported sexual harassment in the past 12 months, which is 20.6 per cent. With regard to sexual assault, Bond University is again first, with a rate of 13.2 per cent, and the top five universities in terms of sexual assault when looked at by sample size are ANU (203), the University of Western Australia (119), the University of New England (117), James Cook University (112), and Notre Dame (89). The results are in line with national trends showing that some institutions consistently report higher levels of both harassment and assault, thus highlighting the need for specific interventions (CDU 2022, Heywood et al. 2022).

With regard to gender and the places where cases of gender-based violence (GBV) take place, the General Campus Areas had the highest number of cases of sexual harassment for both the period since the students began university (SH1: 83 cases) and for the previous 12 months (SH2: 46 cases). Lecture Theatres and Computer Labs came next, with 36 and 20 cases on average, respectively, while the University Libraries recorded averages of 34 for SH1 and 19 for SH2. This is in line with earlier research that has found general campus areas and shared spaces to be typical locations for GBV incidents because of the higher volume of people present and the reduced level of supervision (Henry et al. 2020, Bradbury-Jones et al. 2021). The fact that incidents are concentrated in these kinds of environments underscores the need for specific prevention strategies and for greater campus safety measures, as suggested in the literature (Nisbet et al. 2022).

In terms of the association between gender and experiences of gender-based violence (GBV), focusing on sexual harassment and assault in 36 universities, a p-value of less than 0.001 was obtained. This low p-value shows that the result is statistically significant. It means there is a strong connection between a person's gender and their chance of experiencing sexual harassment. Females are more likely to face sexual harassment compared to males in the universities studied. The result from this study corroborates research that has concluded that women are mostly at risk in terms of experiencing GBV globally (Heywood et al. 2022, WHO 2013, Garcia-Moreno et al. 2006). Our study also indicates that students of other genders, such as transgender and non-binary individuals, face a higher risk of experiencing

sexual harassment compared to their cisgender peers. This finding is supported by earlier research conducted by Martin-Storey et al. (2018), which reported similar results regarding the vulnerability of transgender and non-binary students to sexual harassment.

In terms of students' knowledge about where to complain or seek support within the university regarding sexual harassment and sexual assault, the values for sexual harassment reveal differences in formal complaints and in seeking help within the university setting. Although most students do not know where to find help or how to file a complaint, some universities stand out. Charles Sturt University has 25% of its students seeking support, while the University of Wollongong has 24.1%. With regard to where to report sexual assault, a significant number of students from the University of Western Australia (63.1%) and Australia Catholic University (61.1%) do not know where to report sexual assault. Other universities with high levels of unawareness include Queensland University of Technology and Griffith University, with percentages of 60.7% and 60.2%. The results from this study are similar to other studies which concluded that students lack understanding of what constitutes GBV, how and where to report cases due to unclear policies and systems for educating, supporting and reporting GBV (Nisbet et al. 2022, Henry et al. 2020, Bradbury-Jones et al. 2021). Additionally, in instances where students have reported the abuse they have experienced, universities often overlook and silence GBV victims by providing limited resources to address the issue, resulting in failing to take action when they are informed that a student has been sexually assaulted (Schloeffel et al. 2025). Research shows that many tertiary institutions still struggle how well to respond and effectively implement their GBV policies (Anitha and Lewis 2018, Khalajabadi-Farahani 2025). This calls for an urgent intervention for GBV educational and reporting training to raise awareness. On this note, research calls for GBV to be considered an equity issue due to its impacts on students' academic progress, high stress levels and anxiety (Coffey et al. 2023).

Additionally, results from this study reveals that universities' website have not consistently provided regular updates or reports on incidents of sexual violence, resulting in gaps in the information available to the public. Approximately 56% (22 out of 39) of universities have gaps or inconsistencies in their public reporting. The remaining 44% (17 out of 39) of universities share data on sexual violence reports, disclosures, and responses on their websites without an asterisk. This finding aligns with research conducted by Henry et al. (2020) which pointed out how institutional culture affects the reporting and support systems for GBV survivors. This is an area of improvement on university management to ensure that more consistent and regular updates on GBV cases are provided by all universities in Australia.

Limitations

This study has limitations that should be kept in mind when interpreting the findings. First, relying on self-reported survey data may lead to recall bias and underreporting, especially with sensitive topics like sexual harassment and assault. Students might hesitate to share their experiences due to stigma, fear of consequences, or distrust in institutional processes. This could result in an underestimation of

prevalence rates. Second, the study focuses on Australian universities and leaves out non-university tertiary institutions, which might have different patterns and rates of gender-based violence (GBV). This limits how broadly the findings can be applied to the entire tertiary education sector. Third, while the sample sizes for most universities were large enough, differences in response rates and the lack of updated, consistently reported data for some institutions might influence the accuracy and comparability of the results. Finally, the analysis used institutional infographics and publicly available data, which might not reflect the full complexity or recent changes in GBV incidents and response efforts.

Conclusion and Recommendations

Gender-based violence (GBV) is still a widespread and serious problem in Australian universities. It constitutes significant risks to student security and well-being and threatens the wider aim of educational fairness. This study provides a detailed demographic analysis of the prevalence of GBV, where it occurs, and the factors associated with it. It highlights clear differences based on gender and location. The results show the vital need for strong, university-wide strategies that raise awareness and make support and reporting systems easier to access and effective.

To tackle these challenges, universities should take the following actions:

1. *Strengthen Data Practices:* Improve the consistency, transparency, and frequency of data collection and reporting on GBV incidents. Public data can drive accountability and guide targeted interventions.
2. *Integrate GBV Education:* Include GBV prevention and response education in university curricula and orientation programs. Customized workshops and ongoing training for both students and staff can foster a culture of respect and understanding.
3. *Expand Support Services:* Increase the availability and visibility of confidential, trauma-informed support services. Ensure these services are accessible to all students, especially those from marginalized or remote backgrounds.
4. *Promote Safe Campus Environments:* Invest in campus infrastructure, like better lighting and secure transit options. Establish clear and well-communicated policies for responding to GBV.
5. *Foster Inclusive Leadership and Community Engagement:* Encourage leaders at all levels to support GBV prevention and response. Actively involve students and staff in ongoing discussions and policy development.
6. *Ongoing Research and Policy Reform:* Support continuous research to track trends and assess how effective interventions are. Stay responsive to new evidence by updating policies and practices as needed.

Institutional commitment at all levels is essential for meaningful progress. By using detailed strategies and maintaining a culture of accountability, Australian universities can create safer, more inclusive learning environments. In these environments, all students are protected from gender-based violence and are supported to thrive.

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Designing Coexistence: Speculative Design and Social Innovation within Degrowth Scenarios for 2045

By Andrea Giorgi*

This paper examines how speculative design can operate as a method of social innovation in future contexts marked by ecological limits, ideological conflict, and contested architectural values. The study is situated within a speculative 2045 scenario structured around two opposing social groups: the Vertical Infinitists, who view expansion as a moral imperative, and the Erasure Collective, who regard subtraction, biodegradability, and spatial emptiness as civic virtues. Rather than positioning conflict as a failure of planning, the paper treats social friction as a structural feature of post-growth societies. Methodologically, the research adopts a qualitative research-through-design approach that combines futures framing, persona construction, stakeholder mapping, and a workshop-led mediation exercise. The main design outcome, The Equilibrium Engine, is an Artificial Intelligence (AI)-mediated civic infrastructure that translates incompatible values into visible and negotiable trade-offs. The paper argues that speculative design can move beyond provocation when paired with social innovation frameworks and participatory governance models. Its value lies not in offering final solutions, but in creating conditions for dialogue, public reasoning, and adaptive coexistence. In doing so, the study repositions the designer as a mediator of socio-ecological relations and proposes a design agenda centred on negotiation, pluralism, and civic imagination.

Keywords: *speculative design; social innovation; degrowth; architectural futures; participatory systems*

Introduction

The convergence of climate disruption, widening inequality, resource depletion, automated labour displacement, and institutional mistrust has intensified calls for new political, economic, and cultural imaginaries. In design, these pressures have exposed the inadequacy of solutionist models that treat complex structural crises as if they were isolated technical problems. The language of innovation continues to dominate public and professional discourse, yet many forms of innovation remain tied to growth-based assumptions that deepen ecological overshoot, normalize extractive infrastructures, and weaken collective capacities for long-term care. If design is to remain socially relevant, it must do more than optimize existing systems. It must also help societies imagine, articulate, and negotiate fundamentally different ways of living together.

This paper is positioned at the intersection of speculative design, social innovation, and degrowth thinking. Speculative design is valuable because it expands the field of design beyond instrumental problem-solving and opens a space in which alternative social arrangements can be rendered tangible, discussable, and politically legible. Social innovation is relevant because it reframes design not as the delivery of finished

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solutions from above, but as the enabling of collaborative capacities, distributed agency, and new social relations. Degrowth provides the broader socio-political frame, challenging the assumption that continuous expansion is either desirable or possible, and proposing instead that wellbeing, sufficiency, reciprocity, and ecological balance should guide future collective life.

The specific context of the research is a speculative urban future in 2045. Within this future, social organization is shaped by sharp ideological divergence over the meaning of progress, the role of architecture, and the legitimacy of permanence. Two social groups anchor the investigation. The first, the Vertical Infinitists, believe that growth is a civic good and that vertical expansion, density, and permanent construction express human achievement. The second, the Erasure Collective, understands subtraction as a creative and ethical act, valuing temporary structures, biodegradation, and the restoration of emptiness. The tension between these groups is not merely aesthetic. It concerns governance, public space, material use, ecological repair, memory, and the legitimacy of competing futures.

This conflict is particularly productive for design research because it reveals a key challenge for future-oriented practice: not every future problem can be solved through consensus, and not every social divide should be neutralized into a false harmony. Some differences are deep, value-laden, and persistent. The task of design, therefore, may be less about erasing disagreement than about constructing systems, interfaces, and institutions through which disagreement can become visible, structured, and negotiable.

The central research question is: how can speculative design function as a tool for social innovation by enabling negotiation and coexistence between conflicting value systems in degrowth-oriented futures? The aim of the paper is twofold. First, it seeks to develop a rigorous methodological account of how speculative design can be mobilized as research rather than only as aesthetic provocation. Second, it proposes and analyses a conceptual design outcome, The Equilibrium Engine, as a mediating infrastructure for conflict in a post-growth urban context.

The scope of the paper is intentionally conceptual and methodological rather than predictive. It does not claim that the scenario described will occur, nor that the proposed system should be implemented literally. Instead, it uses a designed future world to explore how different frameworks of value might collide and how design might support coexistence without collapsing difference into managerial neutrality. The paper is organized as follows. The first section introduces the topic, defines the research question, and situates the study. The second section reviews the literature on speculative design, social innovation, degrowth, and design ethics. The third section presents the research methodology. The fourth section presents findings and the conceptual proposal. The fifth section discusses theoretical and practical implications. The final section concludes by reflecting on the contribution and limitations of the study.

Literature Review

Speculative Design as Critical and Social Inquiry

Speculative design emerged as an important challenge to mainstream conceptions of design as market service, product innovation, and user-centred optimization. Dunne and Raby (2013) argued that design could also be used as a medium for asking questions rather than supplying answers, for exposing assumptions rather than smoothing them away, and for opening debate about alternative ways of being. Their contribution has been especially influential because it reframed design from a strictly affirmative discipline into a critical one. In that shift, design no longer serves industry alone; it also serves public reflection.

A key strength of speculative design is its ability to materialize possibilities. Through narratives, prototypes, interfaces, images, and fictional systems, it creates what might be called discursive objects: designed propositions that make larger socio-technical conditions available for interpretation and contestation. Such work does not predict the future in a literal sense. Rather, it stages possible futures in order to deepen understanding of the present. This is why speculative design has become especially important in addressing issues shaped by uncertainty, long temporal horizons, and entangled technological, social, and ecological systems (Auger 2013, Candy 2010).

Yet speculative design has also been criticised. Some scholars have noted that it can drift toward gallery-based provocation without social accountability, or that it may privilege the perspective of the designer at the expense of those most affected by the issues being explored. Others have observed that speculative projects sometimes remain rhetorically powerful but methodologically thin (Mitrovic et al. 2021). These critiques are significant. If speculative design is to contribute to scholarly research and not only cultural commentary, it requires clearer methodological grounding, stronger links to situated communities, and more explicit reflection on ethics, power, and participation.

The present paper responds to those critiques by positioning speculative design not as a self-sufficient practice, but as one part of a broader methodological ecology. Here, speculation is combined with stakeholder analysis, workshop methods, social innovation theory, and governance considerations. In this sense, the project aligns with recent efforts to move beyond speculative design as provocation alone and toward speculative practice as a situated method of inquiry, mediation, and public reasoning. This approach aligns with recent architectural discourse that reconsiders modernity not as a fixed historical style but as an ongoing process of critical reinterpretation and collective experimentation (Mozzato 2025).

Social Innovation and the Role of Design

The concept of social innovation is central to this study because it shifts attention from isolated artefacts to new social practices, collaborative infrastructures, and enabling environments. Manzini (2015) has been one of the most influential voices in this field, arguing that contemporary societies are increasingly shaped by forms of diffuse design in which non-designers actively participate in the creation of solutions, institutions, and everyday innovations. In this view, the designer is not the

sole author of outcomes, but a facilitator of processes that help communities make sense of situations, build trust, and act collectively.

This perspective is especially relevant in future-oriented work. If the goal is not simply to imagine different worlds but to examine how people might organise themselves within those worlds, then design must operate relationally. It must support encounters, negotiations, and forms of collective sense-making. Social innovation is therefore not only about novelty; it is about creating new capacities for cooperation, care, resilience, and democratic engagement. Manzini's emphasis on collaborative encounters, enabling ecosystems, and cosmopolitan localism is particularly useful for a project like this one. The conflict between the Vertical Infinitists and the Erasure Collective cannot be resolved by a single built form or technological interface. It requires a mediating system through which incompatible priorities can be translated, debated, and recalibrated. This is why The Equilibrium Engine is conceived not as a product, but as a civic platform and infrastructural process.

The literature on participatory design further supports this orientation (Sanders and Stappers 2008). Participatory approaches remind us that design is political because it structures whose voice counts, whose knowledge is recognised, and which futures are made visible. They also reveal that conflict is not a methodological inconvenience but often the very site in which democratic design becomes possible. When participation is stripped of disagreement, it easily becomes performative consultation. When difference is acknowledged, however, participation can become a vehicle for legitimate negotiation.

Degrowth as a Framework for Future Social Organization

Degrowth is not merely an environmental slogan or an anti-growth economics. It is a broad political and cultural critique of the assumption that continuous expansion should remain the organizing principle of society (Kallis 2018, Latouche 2009). It challenges the metrics through which success has been measured and asks instead how societies might prioritize ecological stability, equitable distribution, meaningful work, and collective wellbeing. The degrowth literature does not always agree on policy detail, but it consistently rejects the conflation of prosperity with accumulation.

For design, degrowth matters because it destabilizes long-standing assumptions about progress, efficiency, novelty, and consumption (Fry 2009, Irwin 2015). It asks what kinds of design are needed in a world where less extraction, less waste, and less expansion are not signs of failure but conditions of survival. It also raises practical and ethical questions: how should spaces be shared, how should infrastructures be maintained, what should endure, and what should be allowed to disappear? The project draws from degrowth-oriented futures materials that emphasize scenario building, storytelling, sufficiency, and alternative measures of value, which translate abstract macroeconomic debate into everyday roles, social rituals, material choices, and spatial practices. At the same time, degrowth should not be romanticized. A post-growth future will not automatically produce justice. It may intensify tensions over scarcity, memory, distribution, and governance (Raworth 2017). That is why the paper does not present degrowth as a utopia but explores how degrowth conditions may sharpen value conflict and therefore require better mechanisms of public mediation.

Architecture, Mediation, and Contested Futures

Architecture is an especially productive site through which to examine ideological conflict because it materializes values at multiple scales. Buildings embody assumptions about permanence, ownership, labour, time, hierarchy, environmental relation, and public life. They are never neutral containers. In the speculative worlds explored here, architecture becomes the medium through which two divergent worldviews clash. For the Vertical Infinitists, architecture extends human aspiration and secures civic status through accumulation, height, and density. For the Erasure Collective, architecture should dissolve, compost, relinquish space, and avoid becoming a monument to domination.

This opposition resonates with contemporary architectural debates on resilience, adaptive reuse, temporality, ecological repair, and the politics of voids. The literature on adversarial design is useful here (DiSalvo 2012). Adversarial design does not seek premature consensus; it recognizes that plural societies are shaped by contestation and that designed systems can frame disagreement productively. This insight is important for moving beyond simplistic notions of smart urbanism in which data infrastructures are imagined as if they could optimize cities without engaging value conflict. In reality, every metric privileges something. Every threshold excludes something. Every visualization frames a politics. The question, therefore, is not whether mediation is political, but how its politics can be made visible and accountable. Recent work on vulnerable inter-spaces in stratified landscapes further demonstrates how architecture can mediate between fragility and permanence, offering approaches that acknowledge both material vulnerability and historical continuity (Bosone 2025).

Ethics, AI, and the Problem of False Neutrality

Any proposal involving AI-mediated negotiation requires ethical scrutiny. Digital systems are often presented as if they were impartial tools capable of balancing competing interests objectively. This is deeply misleading. AI systems are designed, trained, parameterised, and governed within social contexts. They inherit assumptions from their datasets, their optimization goals, and their institutional owners. When applied to social conflict, these systems risk reinforcing dominant values while presenting themselves as neutral arbiters (Norman 2010).

Design ethics is therefore central to this project. The concept of false neutrality is particularly important. A mediation system that treats both sides equally without acknowledging asymmetries of power, historical injustice, or ecological damage may appear fair while reproducing inequity. In the context of this paper, the challenge is to imagine an AI-enabled system that does not erase conflict, depoliticize decision-making, or transform public values into opaque technical outputs. This ethical concern shapes both the workshop design and the final concept. Participants were explicitly asked to define what the AI should not do, who controls it, and what trade-offs are embedded in its operation. Taken together, the literature suggests that the most promising role for speculative design lies in its capacity to connect imagination to social inquiry, and this paper builds on that intersection.

Methodology

Research Design and Epistemological Position

Figure 1. *Daily Life Contrasts: The Vertical Infinitists and the Erasure Collective in 2045*

Daily Life in Two Worlds	
Vertical Infinitists Architecture: Mile-high megatowers with internal weather, bio-concrete that grows itself, structures lasting 1,000+ years, underground cities 100 levels deep. Daily Practices: Morning elevator meditation during 45-minute ascents, vertical farming at 800m height, never touching ground level from birth to death. Governance: Height-based hierarchy where higher floors grant more voting power. GDP measured in cubic metres added annually.	Erasure Collective Architecture: Maximum 5-year lifespan for structures, mycelium-based buildings that decompose, inflatable shelters, demolition as primary architectural act. Daily Practices: Weekly dismantling rituals, living in structures you helped build, moving seasonally as buildings dissolve, tending "architectural graveyards". Governance: Temporary assemblies with no permanent meeting spaces. Leadership rotates with building cycles. Success measured in square metres returned to nature.

Source: Author.

This study adopts a qualitative research-through-design methodology. Research-through-design is appropriate because the core knowledge contribution of the paper emerges through the generation, testing, and critical interpretation of designed scenarios, stakeholder relations, and conceptual systems (Schon 1983). Rather than treating design as a post-research illustration of pre-existing findings, research-through-design understands design activity itself as a mode of inquiry. The epistemological position of the paper is constructivist and critical. The study does not seek predictive truth about the future, nor does it attempt statistical generalization. Instead, it investigates how design methods can reveal tensions, produce conceptual clarity, and generate transferable insights about mediation in contested futures. The methodology was designed to answer the research question by moving from broad futures framing toward a situated design proposition, integrating speculative design methods with social innovation tools across five phases: (1) futures framing, (2) persona and social-group development, (3) stakeholder and systems mapping, (4) workshop-based mediation design, and (5) conceptual prototyping and reflective analysis.

Phase 1: Futures Framing

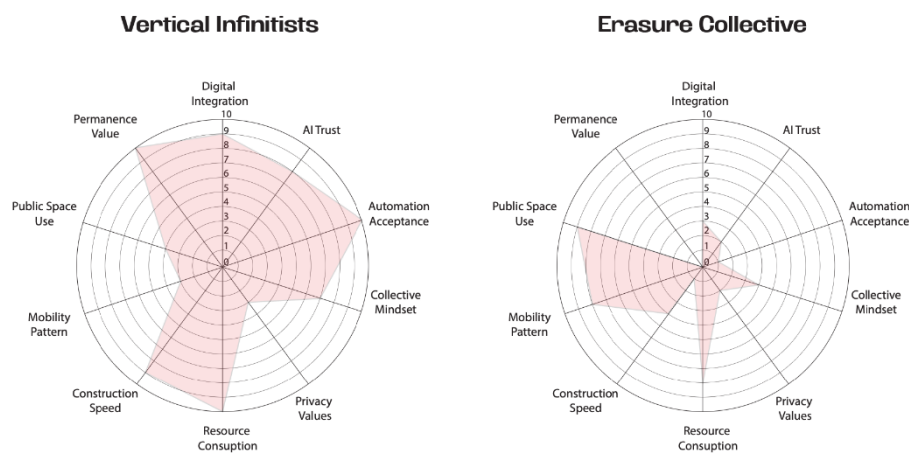
The first phase established the larger future horizon through a four-quadrant scenario logic inspired by futures practice and degrowth futures frameworks. This phase began by identifying two major axes of uncertainty: tensions between growth and degrowth, and between centralised and distributed forms of governance. The purpose of the four-quadrant method was not to produce four polished scenarios for comparison, but to create a structured field of possibility within which one tension-rich world could be developed in depth. The selected scenario emphasised ideological divergence rather

than smooth transition. Many future narratives assume that sustainable societies will emerge through consensus once ecological awareness becomes widespread. The project resisted that assumption, asking instead what happens when post-growth pressures produce more polarised responses rather than shared ones.

Phase 2: Persona and Social Group Development

The second phase translated abstract systemic logics into social worlds. Rather than creating conventional market-oriented personas, the research developed future social groups and representative figures who embodied distinct beliefs, rituals, governance models, and relationships to space. The two main groups selected were the Vertical Infinitists and the Erasure Collective. They were chosen because they represent extreme but legible ideological positions regarding architecture and social order. The Vertical Infinitists were developed as a densely urban, technologically integrated culture that equates vertical growth with collective progress. Their built environment privileges megastructures, altitude-based status, durable materials, and continuous expansion. The Erasure Collective was developed as a distributed, anti-monumental society in which building is temporary, decomposition is valued, and open land has intrinsic meaning. By developing these groups in detail, the methodology allowed the project to move beyond symbolic opposition. The groups became lenses through which questions of power, daily life, environmental relation, and civic value could be examined.

Figure 2. *Radar Chart Comparison: Core Characteristics and Beliefs of the Vertical Infinitists and the Erasure Collective*



Source: Author.

The third phase investigated how conflict between the two groups would operate within a wider socio-technical system. A systems map was produced to identify actors, flows, dependencies, and sites of tension. Stakeholders included not only the two primary groups, but also planners, ecologists, engineers, district custodians, civic

assemblies, non-human entities, material supply systems, public interfaces, and algorithmic infrastructures (Meadows 2008). This phase focused on four analytical dimensions: (1) value conflict — what each group seeks to maximize or protect; (2) resource conflict — how land, energy, materials, and maintenance are distributed; (3) governance conflict — who decides when to build, preserve, dismantle, or rewild; and (4) representational conflict — whose vision of the future becomes visible, legitimate, and measurable. This phase revealed that the conflict could not be reduced to taste or symbolism, making clear that any mediating system would need to operate across environmental, social, and cultural layers simultaneously.

Phase 4: Workshop-Based Mediation Design

A key methodological contribution of the project is the use of a structured workshop, titled *Creating and Visualizing the Mediator*, as both a pedagogical exercise and a research instrument. The workshop brief asked participants to design an AI system capable of translating incompatible values between the two opposing groups into visible and negotiable trade-offs. The workshop was organised in three stages. In the first stage, participants identified one critical conflict requiring ongoing negotiation and wrote a structured tension statement. In the second stage, participants defined the mediator system, selecting AI functions such as translating values, visualising impacts, modelling scenarios, or monitoring thresholds, and described the system in terms of inputs, processing logic, outputs, governance structure, and limits. In the third stage, participants created a diagram, interface concept, or spatial representation of the mediation system and wrote a critical reflection focused on power dynamics, false neutrality, trade-offs, and social consequences. From a research perspective, the workshop functioned as a form of generative inquiry, externalising assumptions, revealing how participants conceptualized conflict, and surfacing recurring design patterns.

Phase 5: Conceptual Prototyping and Synthesis

The fifth phase translated the workshop findings and scenario analysis into a refined conceptual design proposal. The prototype was not intended for immediate implementation. Instead, it served as a speculative infrastructural model demonstrating how design might frame coexistence in a city shaped by deep ideological division. The resulting concept, *The Equilibrium Engine*, was defined as a spatial, temporal, and AI-mediated hybrid system. In methodological terms, conceptual prototyping served two purposes. First, it allowed the research to test whether the earlier phases produced enough clarity to support a coherent proposal. Second, it created a concrete basis for critical discussion.

Findings And Design Proposal

The Great Divergence of 2045

The first major finding is that the project scenario produces a credible model of future conflict not because it imagines difference, but because it imagines organised

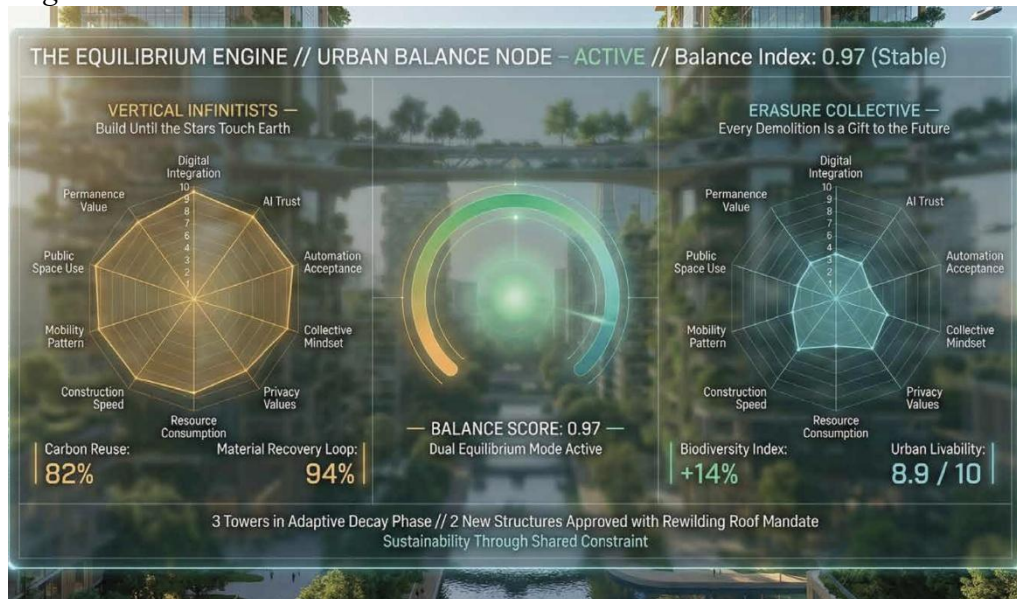
difference. The Vertical Infinitists and the Erasure Collective do not merely hold individual opinions; they inhabit distinct social worlds structured by competing moral, material, and temporal assumptions. The Vertical Infinitists view height, density, and permanence as signs of collective purpose. Their world is built upward and inward. Megatowers, internal weather systems, vertical farming, and enduring bio-concrete symbolize not only technical prowess but civic legitimacy. Space is scarce and therefore must be multiplied. Expansion is interpreted as responsibility rather than excess. The Erasure Collective begins from a different ontology. They see permanent architecture as a burden on future possibility. Buildings should biodegrade, land should regenerate, and demolition can be a gift rather than a failure. Their world privileges cyclical dwelling, temporary structures, rewilding, and social practices oriented toward care, restraint, and relinquishment. The conflict between these groups is not reducible to policy disagreement. It is a conflict over what architecture is for, what the city owes the future, and whether persistence or disappearance is the more ethical civic act.

Conflict as a Structural Feature

A second major finding is that conflict in this scenario cannot be meaningfully "solved" through a compromise object. The workshop and systems analysis both revealed that disagreement extends across metrics, symbols, institutions, and everyday life. A tower that includes biodegradable materials does not necessarily satisfy the Erasure Collective if its overall logic remains monumentalist. Likewise, a rewilded void does not satisfy the Infinitists if it interrupts collective expansion. This matters because it shifts the design brief. Instead of seeking a hybrid artefact that blends both aesthetics, the project recognises the need for a continuing process of public negotiation. What is needed is not a single solution, but an infrastructure for managing incompatible values over time.

Visibility as a Design Requirement

The third finding concerns visibility. In both workshop reflections and conceptual synthesis, one issue recurred: conflict becomes destructive when trade-offs remain hidden. If one group experiences policy decisions only as imposed outcomes, without seeing the criteria or consequences behind them, mediation lacks legitimacy. This insight shaped the proposal of a public interface that displays the shifting balance between growth and rewilding, density and emptiness, durability and decomposition. Visualisation here is not cosmetic; it is civic. The role of the interface is to render urban metabolism and value conflict intelligible enough for public debate.

*The Equilibrium Engine***Figure 3.** *The Equilibrium Engine: AI-Mediated Civic Infrastructure for Value Negotiation*

Source: Author

The principal design proposal of the study is The Equilibrium Engine, a distributed mediation infrastructure for a city divided between opposing architectural philosophies. Its core function is to monitor, visualise, and negotiate the balance between construction, adaptation, decomposition, and ecological restoration, translating social and environmental data into visible, discussable civic choices.

The system gathers multiple forms of input: biodiversity indicators, energy flows, air quality, population density, maintenance demand, land-use pressure, material cycles, and civic preference signals. Importantly, qualitative inputs are also included through citizen assemblies, district feedback, and value declarations, preventing the system from reducing public life to environmental telemetry alone.

The processing layer does not produce a single optimal answer. Instead, it runs weighted analyses based on declared priorities and threshold conditions. For instance, it might indicate that an area has exceeded its material intensity threshold and should enter a phase of contraction, or that a district's housing pressure justifies limited expansion on the condition that ecological restoration occurs elsewhere. Outputs are communicated through public pavilions, holographic interfaces, civic dashboards, and district-level spatial signals. These outputs show consequences and trade-offs; citizens can therefore see not only what is proposed, but what is being sacrificed, protected, delayed, or regenerated.

Governance is a central feature of the concept. The Equilibrium Engine is not controlled by a private platform or opaque urban operating system. It is supervised by a civic assembly composed of builders, rewilders, planners, ecologists, and citizen delegates. Local maintenance is carried out by district custodian guilds with technical and ecological expertise. This arrangement reflects the project's insistence that mediation systems are political institutions, not neutral software. The

trade-offs embedded in the system are explicit. The Vertical Infinitists give up unlimited expansion but gain material renewal, ecological stability, and longer-term urban resilience. The Erasure Collective gives up total erasure but gains institutionalised rewilding, decomposition rights, and meaningful influence over the city's life cycle. Neither group wins completely, which is precisely what makes the system plausible as mediation rather than domination.

The importance of The Equilibrium Engine lies less in its technological novelty than in the way it reframes the purpose of urban intelligence. Contemporary "smart city" discourse often assumes that better data will enable smoother optimisation. This project proposes a different function for urban intelligence: not optimisation without politics, but the structured handling of politics through designed visibility, translation, and deliberation. The conceptual outcome thus demonstrates that speculative design can move beyond dystopian warning or aesthetic fiction to design institutional imagination — systems through which future societies may confront disagreement without collapsing into paralysis or authoritarian control.

Discussion

From Solutionism to Mediation

The findings support a broader argument that the future role of design, particularly in architecture and urban systems, may need to shift from solution-making to mediation-making. This is not a rejection of problem-solving altogether, but a recognition that certain societal conditions are irreducibly plural and conflictual. When value systems diverge at the level of world-making, the most responsible design act may be to create conditions for ongoing negotiation rather than to impose closure. This perspective aligns with both social innovation and adversarial design. Social innovation reminds us that sustainable transformation depends on enabling collaborative capacities rather than simply delivering expert outputs (Manzini 2015). Adversarial design reminds us that democracy requires spaces in which disagreement can be structured rather than denied (DiSalvo 2012).

Repositioning the Designer

A second implication concerns the role of the designer. Within consumer capitalism, designers are often cast as stylists of innovation or translators of user needs into products and services. Within speculative practice, they may become provocateurs or storytellers. This project suggests another role: the designer as mediator of socio-ecological relations. That does not mean the designer becomes a neutral broker. On the contrary, the project shows that neutrality is neither possible nor desirable. Instead, the designer becomes responsible for making tensions legible, staging competing values fairly, and designing infrastructures in which multiple actors can participate meaningfully. This is a demanding role requiring systemic literacy, ethical reflexivity, visual communication skills, and an understanding of governance (Schon 1983, Simon 1982).

The Value of Degrowth for Design Research

The degrowth frame proves particularly generative for design research. It does so not only because it offers a critique of unsustainable development, but because it destabilizes inherited categories of success. Once growth is no longer assumed to be the dominant good, design questions change: how much is enough, what should be preserved, what should disappear, and how should maintenance, repair, decay, and relinquishment be valued? These questions are architectural, social, and political all at once. The project demonstrates that degrowth need not result in a single coherent lifestyle model. Instead, it can become the condition under which multiple responses emerge — some collectivist, some technocratic, some adaptive, some oppositional — contributing to a more plural account of post-growth futures (Escobar 2018).

AI Mediation and the Ethics of Governance

The discussion of AI mediation must remain cautious. The concept developed here is intentionally critical of techno-solutionism. An AI mediator cannot be assumed to produce fairness merely by processing more data. Its legitimacy depends on who defines the inputs, who sets the thresholds, how transparent the outputs are, and what forms of recourse citizens possess. This is why the design includes strong governance mechanisms and explicit limits. The AI does not replace civic judgment; it supports it by modelling consequences, visualising thresholds, and structuring debate. Even then, the risk of false neutrality remains. The concept should therefore be understood as a critical proposition: it asks what an accountable mediation system might require, rather than claiming that such a system can ever become fully neutral.

Limitations of the Study

Several limitations must be acknowledged. The research remains conceptual and does not evaluate how real communities would interpret or contest the proposed mediator. Nor does it test the visual and procedural comprehensibility of the Balance Index with users. The polarised social groups are analytically useful but may oversimplify the hybrid identities that characterise actual urban publics. Finally, the proposal is situated at an architectural and civic scale; its translation into policy, legal frameworks, and technical implementation remains outside the scope of the study. These limitations do not invalidate the contribution. They clarify it: the paper offers a robust conceptual and methodological framework rather than an empirical model ready for deployment.

Conclusions

This paper set out to investigate how speculative design can function as a tool for social innovation by enabling negotiation and coexistence between conflicting value systems in degrowth-oriented futures. It argued that the increasing complexity of ecological and social crises requires design practices capable not only of

imagining alternatives, but also of structuring public mediation where consensus cannot be assumed. Through a research-through-design methodology combining futures framing, social-group construction, stakeholder mapping, workshop-led inquiry, and conceptual prototyping, the study developed a speculative 2045 scenario centred on two opposing architectural cultures. The resulting design proposal, The Equilibrium Engine, was advanced as a mediating infrastructure that makes trade-offs visible and contestable rather than attempting to erase political difference.

The paper contributes in three main ways. First, it strengthens the methodological legitimacy of speculative design by showing how it can be combined with systems thinking, participatory prompts, and governance analysis. Second, it extends social innovation discourse by proposing mediation as a key design function in plural and post-growth societies. Third, it offers a conceptual architectural model in which AI is repositioned from optimiser to accountable translator within civic negotiation. The broader implication is that future-oriented design should not be judged only by whether it produces desirable visions, but by whether it creates conditions for shared reasoning under disagreement.

Further research could extend this work through participatory testing with real communities, comparative analysis of other conflict scenarios, and the development of visual or interactive prototypes that examine how mediating interfaces affect trust, comprehension, and civic agency. What this study demonstrates already, however, is that speculative design is at its most powerful when it is not only imaginative, but institutionally and ethically ambitious.

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Aging in Diaspora from the Eyes of the OG's: The Elderly Greek Australians

*By Maria Irini Avgoulas**

Almost uniformly elderly Greek Australians describe health as absolute happiness, as their most significant and important possession, a treasure, a gift from God. Among the Greek elderly, health is something that is closely linked to religion and God, as they conceptualize their health as a manifestation of God's will. This group largely perceives their state of health to be an aspect of fate that they do not have control over and that must simply be accepted as their lot in life. As a result, they do not understand poor health to be a punishment or trial. Instead, it is to be accepted and coped with as part of the natural order of things. This paper will describe the ways in which religious beliefs define a conceptualization of health held by many elderly Greeks in Melbourne, Australia, and discuss how their religion supports their ability to cope with and accommodate to ill health associated with increasing age. Just this year (2026) Lulle wrote about diaspora and aging, thus demonstrating its significance and importance at present time.

Keywords: *Greek Australia's elderly, diaspora, healthy aging, transmission, generational, health beliefs*

Background

Migration was described by Marois et al. (2020) as a controversial topic. Among the Greek elderly, health is closely linked to religion and God, as they see health as a manifestation of God's will. Savva shared the story of his daughter's illness, "God protected my daughter, she had a terminal illness, was very sick. The doctors were giving me no hope. I prayed to the Virgin Mary and asked for God's help. My daughter's health returned. It was her fate and God's will for her to be ok".

Among the Greek people we see that culture builds resilience, it started among the Greek elderly, and this cultural belief and way of life is followed and believed by the descendants of the elderly.

The usefulness of these transmissions can be very powerful at both a micro and macro level, for individuals, communities and society in general, particularly as cultural contexts can and do influence peoples' lives and their understanding of illness, including prevention and its outcome. This is of significance as the older people of Greek background tend to rely on children and grandchildren for advice and health and medical issues, there may be significant transmission of health knowledge deriving from mainstream Australian culture passed from child/grandchild to parent/grandparent. Chronic illness is a significant life event on a number of levels.

One such illness is cardiovascular disease (CVD), which is a major health problem in Australia. In 2011¹ a study was undertaken in Melbourne Australia that

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investigated the cultural understanding of health and adjustment to cardiovascular disease among the Greek elderly.

Culture influences how people think about illness and/or health as well as their general attitudes towards healthcare. The way individuals adapt to a chronic illness is closely related to the cultural and linguistic factors that are an integral part of personal identity. The Australian Greek population is one subgroup whose linguistic and cultural background is significantly different from the English-speaking mainstream and who display a high prevalence of CVD risk factors.

The findings from this present study show that traditional health beliefs affect the way in which this group respond to medical advice and adapt to their own condition.

The Greek elderly of Melbourne perceive illness in old age as part of an individual's fate and has to be approached with stoic acceptance. This group largely sees health to be an aspect of fate/luck. Acceptance of a predestined lot among these elders is a means of resilience to illness particularly in old age as fate or luck is not random. The belief held by this group is that health in advanced age is a matter of fate that has been pre-determined by God. Since "it's all in God's hands" the prevalent attitude becomes "let's live life and whatever happens, happens".

Religious beliefs provide means of adaptation and resilience for elderly Greek Australians and a way of coping with and understanding chronic illness such as CVD. This resilience, in turn, is shaped by their cultural framework, of which religion is a part, and that has been maintained even in diaspora in Australia. This highlights the importance of culture in shaping experience and suggests, for this population at least, that traditional interpretations still represent a powerful support for resilience and adaptation to illness in old age.

The need for more research is much needed as its quite significant particular among other diaspora communities. Studies like these are important as the basis for interventions to this cultural group and can assist health professionals in developing appropriate services and supports when working with elderly Greek members of the community. Further, similar research examining the conceptualization of health of other cultural groups in Australian society will support a better understanding of the impact of culture on health and allow for the needs of all Australians to be met more research needs to be undertaken. Traditional culture holds a vital role for the overall wellbeing of Immigrants living in diaspora.

This paper will discuss the significance of traditional culture and wellbeing in the life of immigrants and their descendants; particularly how ethnic culture can both be maintained and support assimilation and adaptation for those living in Diaspora.

The findings reported in this paper show the following (1) transmitted ideas about health behaviour; (2) role of language in maintenance – cultural identity and specific cultural health beliefs and (3) the role of religion as a form of resilience and identity factor across the generations. The findings of this research show how the Greek cultural identity of the respondents has shown the centrality of identification as Greek in the conceptualization of identity, despite the fact that

¹As this group is unique -as they belong to the original group (OG) of the diaspora- the research is still relevant despite it being conducted in 2011 – its relevance is still evident today as the foundations of the OG's have been transmitted to the Australian generations as per Avgoulas (2025).

what exactly constitutes being “Greek” differs and can be viewed as coming from the experiences of each generation.

The identity of all generations was an interesting phenomenon, and in turn influenced transmitted ideas about health, the role of language, cultural identity and cultural health beliefs as well as the role of the Greek Orthodox religion. This occurred predominately through the elements of cultural maintenance that were transmitted to the Australian born generations by the immigrants. Great importance was placed on four key aspects of their Hellenic heritage being religion culture, language and food as being vital across all generations to maintain and transmit. The meaning of Greek changed slightly with each generation; however, the core remained. For example, with the oldest ones, Greekness encompasses virtually every aspect of their identity with English/Australia being a thin layer on top. For the youngest ones, it is the opposite – they are Australian in every way with a few comparatively superficial Greek behaviours, like food and the Greek lifestyle.

Identity for this group along with the concept of who we are and where we belong has been interconnected to their overall positive state of health, as well as, creating a sense of conflicted identity. For the Australian born generations in a sense they were torn in between two identities and hence feeling loyalty towards both their Greek and Greek Australian identity. I recall being told by a member of the Australian born generation of a holiday experiences in Greece and the connection and sense of belonging they felt in Greece that they did not feel or experience in Australia – where they were born, raised and lived. They connected holiday experiences in Greece with the Greek language and the sense that they did not want to be seen as tourists in Greece, as they tried to speak Greek and trick waiters that they were “real” Greeks.

In 2021, a study was undertaken by Devi et al. that examined diaspora, embodied aging in India – the work here was from the perspective of the Indian diaspora. De Haas et al. (2020) have an interesting chapter in the topic of migration and their work is quite fascinating. The onset of chronic illness is a significant life event that poses a frightening challenge at a micro and macro level. The way in which individuals adapt to chronic illness is closely related to the cultural and linguistic factors that are an integral part of personal identity. This research presents the health beliefs of elderly Greek Australians and the way they understand health and disease. The process through which elderly Greek Australians conceptualise CVD and seek medical care is discussed in the context of their specific cultural views and attitudes towards illness.

Research Questions

This research addresses the following questions:

1. What are the health beliefs of elderly Greek Australians?
2. How do elderly Greek Australians conceptualize cardiovascular disease?
3. What are their specific cultural views and attitudes towards cardiovascular disease?

4. How do traditional views and beliefs about health affect the way in which they respond to medical advice and adapt to their own condition?

Aims of the Research

This study explores the health beliefs of elderly Greek Australians and the ways in which they understand health and disease. It examines more closely the conceptualization of health of this group, their understanding of heart disease and the factors associated to becoming a person at risk, and, in turn, the social and cultural determinants of risk behavior. This study provides insight into specific issues affecting this population and can serve as the basis for interventions specific to this population.

Brief Outline of the Theoretical Framework

This study makes use of a cultural epidemiology framework to examine the way elderly Greek Australians understand health and how this may affect their response to illness and disease within their cultural context. This approach allows for an examination of the way in which culture factors specific to this group affect their experience of illness and offers insight into their way in which they view and cope with their own condition.

Brief Outline of the Methodology

An ethnographic approach was taken to collect empirical data on the health beliefs of elderly Greek Australians and the way in which they understand health and disease. This qualitative approach was used to elicit the subjective reality of the participants who took part in this study and to understand the cultural meanings they ascribe to the experience of CVD. Data was collected through in-depth semi-structured interviews, and data analysis undertaken using principles of thematic analysis.

Limitations

This research has several limitations. It is based on interviews with a small number of elderly Greek Australians with experience of CVD. Their views and perceptions may not represent those of all individuals of similar background and experience. Further, this research was conducted in Melbourne and may not reflect the situation of similar populations in other parts of Australia or the world. Additionally, the elderly participants in this study shared a similar background in the Greek language and culture. Their views and perceptions may not be relevant to other population subgroups with a different background culture. Finally, this study does not address the prevalence of health conditions in this population or consider the relative importance of CVD among elderly Greek Australians in comparison to other chronic diseases. It is intended only to assess culturally based attitudes and perceptions, not provide information about the health status of this group

Introduction

Culture is food, language, beliefs, appropriate and acceptable behavior, way of life of a specific population, the backbone of who we are and much more. Culture however also is a natural manifestation of human nature that allows individuals to give meaning to an experience and often this meaning is a product of their culture (Geertz 1973). With reference to health, Mechanic (1992) describes health as a formation of both culture and social structure. As culture can influence one's behavior and overall understanding of health and illness as well as general attitudes towards health care, an understanding of culture is vital in understanding how individuals view their own health. With reference to the Greek culture and cultural attitudes towards illness, for example, misunderstanding can occur regarding appropriate behavior between the family and/or patient and health professionals.

The Greek people are very supportive when a member of their family is sick; instinctively they take on the care role as their responsibility and duty. When a Greek patient is in hospital, their relatives visit and stay with them as long as possible, often disobeying policy and procedures put in place by the medical facility such as visiting hours or number of visitors. This is not a deliberate act to disrespect the rules but a misunderstanding due to cultural interpretations of appropriate behavior. Hartog and Hartog (1983) noted that "medical professionals tend to perceive this type of behavior as peculiar at best or an obstacle to good, efficient, modern medical care" (p. 910).

Cultural background is a significant influence on the cognitive/emotional dimension of health as well, and there is a complex relationship between the biological factors that relate to illness, the social context in which a person experiences them, and that person's cultural and linguistic heritage (Kirmayer and Sartorius 2007). This accounts in part for the differences in how the experience of illness affects individuals and their ability to cope with, adapt to, and/or recover from a given condition. The existence of culture-specific illness behavior is well established (see for example, Roy et al. 2005, Canino and Alegria 2008) and may influence a range of health-related behavior, including whether professional advice is sought, whether that advice is followed, and to what extent the individual believes that health care is an appropriate means to address the situation in question.

In the case of the Greek community specifically, it has been noted that a high degree of dual acculturation is common (Ballotis 2005). Nonetheless, individuals tend to maintain very close, extended family networks that form their central social institutions (Francis and Papageorgiou 2004, Georgas et al. 2006). The reciprocal relationships, between parents and children, older and younger relatives, and so on, have traditionally been a source of strength in times of adversity, including illness, and have allowed for greater resilience than that experienced by some other immigrant groups (Georgiades 2010).

The existence of strong social networks that create a supportive environment and reinforce beneficial cultural patterns (such as a Mediterranean diet associated with lowered risk for heart disease) have been seen as especially significant among Greek Australians whose mortality from cancer and cardiovascular disease is lower than for other groups (Anikeeva et al. 2010). Nonetheless, the prevalence of type 2 diabetes is estimated to be three times higher for this population than for the Australian born, and

levels of obesity are higher as well (Hodge et al. 2004), suggesting the advantageous effects of cultural maintenance may be significant.

Cultural maintenance for Greek Australians centers on interaction with others from a similar background, whether family members or friends is important, and this type of interaction is often seen as crucial for the maintenance of health. A lack of participation in social activities, either through unwillingness or inability, is often seen by Greek Australians as both a sign and a cause of mental illness such as depression which is understood by them to be chronic and social in origin (Kiropoulos and Bauer 2011). This stresses the importance of social networks in the conceptualization of health held by many members of this community and is also an indication of the role such networks play in maintaining and transmitting traditional views, perceptions, and behavior.

Results

A health belief can generally be described as a phenomenon that is formed and shaped by people around us, in particular family, such as parents to children, grandparents to grandchildren and so forth. People's beliefs in life manifest from their culture of origin, their way of life and their ancestral customs. Transmission of such beliefs often spans generations and shape health beliefs and practices which are passed from older to younger individuals. Interestingly, these beliefs are not grounded in medical fact, instead they are learned from the society in which a person lives in and have evolved over time and become embedded in the culture as "trustworthy".

This is exemplified by the Greek population of Melbourne whose understanding of heart disease and the factors associated with becoming a person at risk as well as the social and cultural determinates of risk behavior was examined in a qualitative study undertaken in 2011². Thirteen individuals (five male and eight female) over the age of 60 who had been diagnosed with cardiovascular disease or had a family member that they cared for with this condition and who expressed an interest in participating in this study were interviewed in depth about their experience of illness and the way in which they understand this condition. An ethnographic approach (see Maxwell 2004) was used to identify the way in which cultural precepts that underlie their conceptualization of health are manifested in the meaning given by elderly Greek Australians to the experience of CVD and, further, how this affects their adaptation in the context of this condition. One of the researchers is a member of the Australian Greek community and was able to undertake this research in the language of the participants but, due to differences in age, training and experience, occupied both a position of insider and outsider (see Dwyer and Buckle 2009 for a detailed discussion of this issue).

The Greek population of Melbourne can be described as very religious. It is important to note that, for the migrant generation that was the subject of this study, religion along with the traditions of their culture is of great significance that they often

²Despite the data collection being undertaken in 2011, it is still relevant today as the descendants of the elderly follow in the same footsteps as shown in recent research undertaken and associated publication (please see for example Avgoulas and Fanany 2026a, 2026b).

describe as their most valuable possession (Avgoulas and Fanany 2012a). The majority of these early migrants arrived at Station Pier in Port Melbourne with nothing more than a small suitcase containing very few passions and a large store of information about their culture and way of life. It is not uncommon for these elders to say “water and soil from your homeland equals health and prosperity”. The early years of their settlement were difficult ones, but they felt that if they kept their homeland and the Greek way of life close to their hearts, things would work out. The Greek way of life, traditions and culture has been kept very much alive and handed down from one generation to the next as the long history and cultural richness of the Greek tradition is a great source of pride for its members, and this is a key characteristic of the Greek community in Melbourne, Australia.

For this population, illness in old age is part of an individual’s fate and has to be approached with acceptance. Acceptance of a predestined lot among this population can be seen as a means of adjustment to illness, particularly in old age, as this group does not see fate or luck as random. The events of an individual’s life are viewed as being determined by God, and religion serves as the link between the individual and the divine. In this sense, religion can be described as a coping mechanism providing a source of resilience for the misfortunes in life (see Avgoulas and Fanany 2012a). In addition, to drawing personal strength from their religion, this group views its own experience through the lens of faith which suggests a meaning for these events (see Avgoulas and Fanany 2012b, for further discussion on this). Religion, then, supplies and etiology for illness and also suggests various means by which it can be addressed through personal behavior, prayer, ritual, and other activities that give the experience meaning. Meaning based resilience has been observed to be very strong and more enduring, especially among the elderly (Folkman 2008), and religion is one of the most powerful sources of this kind of meaning. Religion plays a very significant part in the lives of the elderly Greeks in Melbourne, Australia socially as well as emotionally. Additionally, in their feelings at least, it binds them to their original homeland and to the cultural experience of their ancestors.

Discussion

There are certain events in an individual’s life that can be described as moments of impact or events that occur out of sequence, interrupting the expected progression of the life course. Illness, accidents, or even a sudden romance or separation may all fall into this category. Instances such as these may only take moments to occur, even though the individual may wonder about their cause for the rest of his or her life. Traditional health beliefs, such as those held by the elderly Greeks studied here (in the original study in 2011) are also a dominate finding in the Australian born generations (see for example Avgoulas and Fanany 2026a, 2026b).

Interestingly, for this all generations of the diaspora see that events do not just happen, and everything in life has a reason and purpose. These older individuals accept that each person has a predestined lot, which comes from God and is not random. Without fail, the participants of this study believed that their state of health is an aspect of fate and/ or luck (*τύχη*) that they do not have any control over and must

simply accept. More specifically the belief held by this group is that health at an advanced age is a matter of lot and is associated with an element of luck in their overall fate that has been predestined. Their destiny, in turn, has been predetermined by God in accordance with His judgment for them and cannot not occur. For this reason, they view every occurrence, including those with negative outcomes such as illness, as having a specific meaning and purpose in their life.

Almost uniformly, the elderly Greek Australians that took part in the 2011 study described health as absolute happiness, as their most significant and important possession, as “a treasure and a gift from God”. It is important to note that this understanding of the etiology of disease as resulting from divine will and not from individual risk factors, is of great significance as they perceived that there is no real need to change the way they conduct themselves or do anything special about their illness. There was an indication that these individuals felt that following health advice might be viewed by God as them making an effort to take care of themselves, and hence beneficial in terms of pleasing God, but not necessarily changing the outcome of their condition or improving their health in the way doctors or other health professionals intended. One of the participants mentioned that he only took part in cardiac rehabilitation and hence changed his diet to be able to care for his grandson.

“My heart attack took away my independence and more importantly my daughter was worried that I'm too unwell to care for my grandson and told me that I can only win her trust if I listen to the doctor's advice. I agreed, as picking up my grandson from school and taking him to soccer is more important than great amounts of sugar in my coffee. My daughter thinks that sugar and my unhealthy diet caused my heart attack, she doesn't understand that we cannot avoid destiny”.

This statement echoes a view held by most of the participants of this study and, as a result, they were mostly concerned that their illness be manageable and did not feel distress at having a diagnosis of cardiovascular disease. Instead, their distress centered on the possibility that worsening health might prevent them from fulfilling their social role, and isolate them from their peers and families.

Absolute happiness was of great significance to the participants of this study, something that they described as “a gift from God” that they had to protect by not being anxious and stressed about things and, more importantly, never had to question. One of their methods in coping with stress and/or anxiety is through religious expression and by seeking strength in their faith. Religion was also described by a participant of this study as something that has helped her accept her condition and that has prevented her from asking “why?”, as questioning God's will can be perceived as a sin. Nonetheless, many of these elderly Greeks felt it was wholly appropriate to request God's intervention in protecting the health and well-being of their loved ones.

One participant described religion as a good luck charm (*φύλαχτό*) stating “in the morning when my children leave for work, I pray for them to be safe, and I know this protects them”. This religious act reassures the person involved and allows them to put their concern aside, resulting in peace of mind and acceptance of whatever occurs. Similar ideas are readily expressed by older members of the Greek community who have experienced a serious illness, demonstrated the kind of faith based resilience described by Pargament and Cummings (2010) among others. The ritual of faith

offers patterns of behavior in times of trouble but also provide a vehicle of the expression of emotion as well as reassurance and connection with the larger community of faith.

For this population, evidence shows that religion is in fact a source of resilience and can also offer a framework into which illness fits as an expected potential life experience. Unlike the mainstream Australian population, the elders of the Melbourne Greek community have maintained their traditional culture, and particularly the Greek way of life. Cultural maintenance is of great importance for these migrants and has become a key characteristic of this group. The current economic crisis in Greece has seen a new wave of migrants coming to Melbourne, and the established Greek community of Melbourne has assisted the new wave enormously with their transition to life in a new country. These newcomers often feel the new little Greece of Melbourne is like the old Greece of the 1970's, as Greek society has evolved under its own social, cultural and political forces while the little Greece of Melbourne represents an idealized view of the remembered culture of earlier migrants. The newcomers tend to see Melbourne Greeks as "more patriotic" and Melbourne is said to be more cultural, while Greece has changed over the years to align with 21st century Europe. The aspirations of the original wave have been achieved at present, and subsequent generations of Greek Australians have grown up within the cultural context created by the original immigrants despite being highly assimilated in other ways. It remains to be seen, however, whether faith and/or religion plays a similar role for these younger community members and whether it will serve them as a source of resilience as they move through the life course. Furthermore, it is not yet clear whether the memory culture that was created by the original Greek immigrants will be maintained by 1st and 2nd generation Greek Australians and how the new wave of migrants will influence the Greek community of Melbourne.

For the current population of elderly Greeks, however, their religious faith and culturally based worldview is an integral part of their personal and group identity that affects every aspect of their experience, including the inevitable health issues that are to be expected in an aging population. This situation has significant practical implications as more members of this group require health care and support as their age increases as many of their views are incompatible with the principles of evidence-based medicine and may contravene the usual practices of the health care sector. While this issue is not unique to the older members of the Australian Greek community, their perceptions and experiences point up some of the difficulties that may emerge in relation to aging and age-related health care for culturally distinct population groups relative to the majority culture.

Conclusion

Without fail, the elderly Greek Australians who participated in this study associate their diagnosis of CVD very closely with God's will and largely believe their state of health is an aspect of fate and/or luck that they do not have control over and must simply accept. It is important to note that the words "fate" and "luck" (*τύχη* = *tyche*; *γραφό* = *grapho*) have a significantly different meaning in the Greek language when compared to the English. "Luck" to this group is not random, which is the usual

connotation of the word in English. *Tyche* (τύχη) was used in classical times to refer to a kind of minor deity that controlled the fortune of the Greek city states. This is of significance in understanding the meaning that these older Greek individuals give to the word “luck” in the modern world, which clearly shows that what seems to be random chance is really volitional on the part of a higher being. In the modern context, this is God, but certainly for this group, “luck” does not mean something that occurs without any reason. *Grapho* (Γραφτό) means “destiny; something that is written” and contains the root “graph”, that occurs in the English words photograph (“written by light”), graphic (“having to do with writing”), and so forth. In its usual usage in Greek, *γραφτό* refers to something that must happen to a person because it is predetermined and cannot not occur.

Acceptance of a predestined lot among this population can also be described as a means of adjustment to illness, particularly in old age, as fate or luck to this group is not random. The belief held by this group is that health at an advanced age is a matter of their individual lot. It is associated with an element of luck and their overall fate that has been predetermined by God in accordance with His judgment for them and hence not random in the sense of having no purpose. It is important to understand that the etiology of disease for the Greek elderly of Melbourne, as resulting from divine will and not from individual risk factors, is of great significance as they perceive that there is no real need to change the way they conduct themselves or do anything special about their illness as illness is part of an individual’s fate. For example, there was recognition among this group that certain measures, such as diet and exercise, could be taken to improve health and wellbeing in the context of CVD, however their overall belief was that their health comes from God.

At the same time, there may be little inducement for members of this group to change their behavior in the context of ill health because of a perception that such measures do not really matter, either in the context of their health or in relation to the outcome of disease. There was an indication that these individuals felt that following health advice might be viewed by God as them making an effort to take care of themselves and hence beneficial in terms of pleasing God but not necessarily changing the outcome of their condition or improving their health in the way doctors or other health professionals intended

Recommendations

This study has shown the significance that culture can have on the conceptualisation of health and disease. Elderly Greek Australians were the focus of this research; more specifically this population’s health beliefs were examined in the context of their specific cultural views and attitudes towards illness. This study in itself is significant, as it has provided insight into the general health beliefs of elderly Greek Australians and more specifically what their cultural views and attitudes are towards CVD. The findings have shown how traditional health beliefs affect the way in which elderly Greek Australians respond to medical advice and adapt to their own condition.

Studies such as these are important as they can serve as a basis for interventions at a macro level specific to this cultural group and in turn can assist health professionals in developing appropriate interventions, services and supports when working with elderly Greek members of the community. As the findings have indicated, illness in old age is perceived by this population as part of an individual's fate and has to be approached with acceptance. Traditional religious beliefs provide a means of both adaptation and resilience for this group. The role of religion is very significant with reference to elderly Greek Australian's in coping with and understanding chronic illness such as CVD.

In addition, this study has also provided valuable insight for future research that can be undertaken as indicated in the limitations of this research. It is recommended that future research be conducted in this area by exploring a similar population in other parts of Australia. Further, there is likely to be value in similar research examining the conceptualization of health of other cultural groups in Australian society that will support a better understanding of the impact of culture on health and allow for the needs of all Australians to be met more effectively.

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Deportation Timing and Jewish Holocaust Survival in Greece: Evidence from 23 Cities

*By Gregory T. Papanikos**

This study examines variation in Jewish survival across Greek communities during the Holocaust, focusing on the role of deportation timing and city population. Combining quantitative and qualitative evidence, it analyzes community-level data for 23 Greek cities using regression models incorporating city population, the number of days between the beginning of Greece's deportation campaign and deportation in each city, a quadratic temporal term, and their interaction. Deportation timing emerges as the most consistent statistical correlate of survival. The association between deportation timing and survival is positive; evidence of nonlinearity is suggestive but sensitive to the inclusion of the latest-deported community. The qualitative evidence identifies mechanisms through which additional time could create opportunities for survival, including obtaining information, recognizing the threat, securing false documents, hiding, fleeing to rural or mountainous areas, mobilizing resistance networks, and obtaining assistance from local populations and authorities. Drawing on the literature on rescue, the study conceptualizes survival as an interaction between the temporal opportunity created by delayed deportation, the capacity of Jews to recognize and exploit opportunities for survival, and the availability and capacity of potential rescuers and local networks. The findings suggest that time was a necessary but not sufficient condition for survival and highlight the importance of temporal, social, geographical, and institutional conditions in explaining variation across occupied Greece.

Keywords: *Holocaust; Greek Jews; Jewish survival; Greece; deportation; rescue; resistance; city size; urban population; survival rates.*

Introduction

Jewish survival during the Holocaust varied enormously across European countries. By 1945, approximately two-thirds of Europe's Jewish population had been killed, but the scale of destruction differed dramatically across countries. According to estimates compiled by the United States Holocaust Memorial Museum, approximately 99% of Denmark's prewar Jewish population survived, compared with about 75–78% in France, 73% in Belgium, and 86.5% in Italy. Survival was substantially lower in countries such as Germany (30.5%), the Netherlands (27.3%), Hungary (39.3%), and Poland (10.4–17.3%). Greece was also among the countries with the highest levels of Jewish mortality: of an estimated Jewish population of 71,611 in 1941, approximately 58,800–65,000 Jews were killed, implying a survival rate of only about 9–18% (United States

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Holocaust Memorial Museum 2026). These striking differences demonstrate that Jewish survival was far from uniform across Europe and raise important questions about the conditions that allowed some Jewish populations to survive while others were almost completely destroyed.

The substantial variation observed within Greece is equally striking and provides the central empirical motivation for this study. Although Greece as a whole experienced one of the highest Jewish mortality rates in occupied Europe, survival differed dramatically among its Jewish communities. In some cities, survival was extremely limited, particularly where deportations began soon after the German occupation or where opportunities for escape and concealment were constrained. In others, substantial proportions of the Jewish population survived through flight to rural or mountainous areas, concealment, false identities, resistance networks, and assistance from local populations and institutions. The contrast is particularly evident between communities such as Thessaloniki, where the overwhelming majority of Jews were deported and murdered, and communities such as Athens, Volos, Larissa, Trikala, and especially Zakynthos, where much larger proportions survived. This substantial inter-city variation raises a fundamental question: why did Jewish survival differ so markedly among communities exposed to the same broader occupation and persecution regime? The present study addresses this question by examining whether differences in population size and, more importantly, in the time available between the beginning of the deportation campaign in Greece and the onset of deportations in each community help explain these differences in survival.

Previous research on Holocaust survival has emphasized a wide range of factors, including the timing of deportation, demographic characteristics, geographical conditions, the behavior of local authorities, resistance networks, and assistance from the non-Jewish population. The Greek case provides a particularly useful setting for examining these relationships because deportations did not occur simultaneously throughout the country. The deportation campaign began in March 1943, but Jewish communities in different parts of Greece were deported at substantially different dates. This temporal variation provides an opportunity to examine whether communities deported later generally experienced higher survival rates. At the same time, because deportation dates were shaped by broader occupation policies, geographical conditions, and local circumstances, timing cannot be interpreted independently of these factors. The quantitative results are therefore understood as evidence of statistical association rather than as estimates of a causal effect of additional time.

The analysis combines quantitative and qualitative evidence. The quantitative component uses community-level data from 23 Greek city-community observations to estimate several regression specifications examining the associations of Jewish survival with host-city population and deportation timing. The models consider linear and nonlinear relationships between timing and survival and test whether the association between city population and survival varies with deportation timing. The analysis is complemented by qualitative evidence from individual communities, which is used to examine the mechanisms through which opportunities associated with later deportation could be converted into actual survival. These mechanisms included hiding, false identity documents, flight to rural and mountainous areas,

dispersal among non-Jewish populations, assistance from resistance organizations, and intervention by local officials and religious leaders.

The analysis is guided by three hypotheses. First, Jewish survival rates are expected to be positively associated with the population of the host city, reflecting the potential importance of anonymity, social networks, and the greater diversity of urban institutions. Second, survival rates are expected to be positively associated with deportation timing, because communities deported later had greater opportunity to obtain information and organize protective measures. Third, the association between city population and survival is expected to depend on deportation timing, suggesting that demographic and temporal conditions may interact rather than operate independently.

The results indicate that the positive association between deportation timing and survival is the most robust statistical finding in the sample. Evidence for a nonlinear relationship is suggestive but sensitive to the inclusion of the latest-deported community, while host-city population and its interaction with deportation timing do not receive statistically robust support in the preferred specifications. The qualitative evidence provides further insight into the mechanisms underlying the statistical relationship. It suggests that additional time could create opportunities for protective action, but that such opportunities could be converted into survival only where local social networks, geographical conditions, institutional responses, and resistance or assistance networks made escape, concealment, or dispersal feasible.

Physical survival, moreover, did not imply the preservation or restoration of Jewish communal life. As Králová (2018) shows, Greek Jewish survivors faced profound social, economic, and psychological disruption after the war, while the destruction of families, property, and communal networks fundamentally altered the communities to which they returned. The present study focuses narrowly on wartime survival and does not examine these postwar consequences. This distinction is important because individual survival and the survival or reconstruction of Jewish communities represent different dimensions of the Holocaust's consequences.

The paper proceeds as follows. Section 2 develops the theoretical framework and hypotheses. Section 3 presents the data and descriptive statistics, while Section 4 describes the empirical methodology and reports the regression results. Section 5 examines the mechanisms of survival across Greek Jewish communities. Section 6 discusses the limitations of the analysis, and Section 7 presents the conclusions.

The Survival of Greek Jews: Theoretical Framework and Hypotheses

The survival of Jewish communities in occupied Greece during the Holocaust reflected an interaction between structural conditions and local responses. Some characteristics of the communities and their urban environments can be measured quantitatively, whereas other factors—including the behavior of local officials, religious leaders, resistance organizations, and individual members of the non-Jewish population—are more difficult to quantify systematically. Previous research on Holocaust survival has examined both dimensions. Quantitative studies have identified associations between survival and locality-level characteristics such as population size, urbanization, and administrative geography (Tammes 2007, 2017,

2019, Braun 2016, 2019). Historical case studies, meanwhile, emphasize the importance of local institutions, social networks, and the decisions of individuals and organizations in determining whether opportunities for escape, concealment, or assistance could actually be realized (Saltiel 2020, Antoniou & Moses 2018). These perspectives are complementary: structural conditions could create opportunities for survival, but their significance depended on the responses of local actors.

Bowman (2009) provides a comprehensive historical account of the Holocaust of Greek Jewry during 1940–1945 and emphasizes the substantial variation in the experiences of Jewish communities across Greece. His analysis highlights the importance of the timing and organization of deportations, the different occupation regimes, the responses of Jewish communal leaders, opportunities for escape and concealment, participation in resistance, and assistance from non-Jewish Greeks. Particularly important for the present study is the fact that German-, Italian-, and Bulgarian-occupied territories experienced different patterns and intensities of persecution and deportation. The timing of deportations therefore varied substantially across Greek communities, creating different circumstances in which communities could respond to the developing persecution.

An important contemporary source for reconstructing the destruction of Greek Jewry is the work of Michael Molho and Joseph Nehama (1974). Originally published in several volumes shortly after the Holocaust, it documents the persecution and destruction of Jewish communities throughout Greece and provides information on deportations, victims, survivors, and communal institutions. Compiled by representatives of the Jewish community of Thessaloniki in the immediate postwar period, the work also provides an important Jewish communal perspective on the Holocaust. In the present study, such contemporaneous records are particularly valuable for cross-checking population figures and survival estimates reported in later historical studies.

The quantitative analysis focuses on two structural variables: the total population of the host city (POP) and deportation timing (DAR), measured as the number of calendar days from the beginning of the deportation campaign in Greece to the beginning of deportation in each community. These variables are not intended to capture the full range of circumstances that affected survival. Rather, they represent two measurable dimensions—urban scale and temporal opportunity—that may have shaped the ability of communities and individuals to respond to persecution. Qualitative evidence examined in Section 5 is used to explore the local mechanisms through which these structural conditions may have influenced survival.

City Population and Urban Anonymity

The first theoretical argument concerns the size of the host city. Larger cities may have offered Jews greater opportunities for concealment because of their larger and more heterogeneous populations. In a small town, residents were more likely to know one another personally, making it potentially easier for collaborators or authorities to identify individuals who were attempting to hide or assume a false identity. Larger cities, by contrast, offered greater anonymity and a wider range of social and institutional settings in which individuals could seek assistance or conceal their identity.

Urban size could also be associated with greater institutional capacity. Larger cities generally contained more organizations, religious institutions, administrative offices, and social networks through which assistance could potentially be organized. Such resources could facilitate the production or acquisition of false documents, the identification of safe places, the movement of individuals, and access to sympathetic officials or resistance networks. These possibilities do not imply that large cities necessarily provided greater protection; rather, they suggest that urban scale could create resources that became valuable when local actors were willing and able to use them.

This argument has a broader basis in the sociological literature on urbanism. Simmel (1903/1950) emphasized the impersonal and relatively reserved character of social relations in large cities, contrasting them with the closer interpersonal familiarity associated with smaller communities. Wirth (1938) similarly argued that population size, density, and heterogeneity weaken personal acquaintanceship and alter the mechanisms of informal social control; Guterman (1969) subsequently defended important elements of Wirth's argument. Applied to the circumstances of occupation, these ideas suggest that anonymity in larger urban environments could make identification and denunciation more difficult.

Glaeser and Sacerdote (1999) provide a related argument in the economics of urbanization. They associate higher crime rates in larger cities partly with lower probabilities of recognition and weaker informal social sanctions. Their analysis does not concern Holocaust survival, but the underlying mechanism provides a useful theoretical analogy: where individuals are less likely to be personally known, monitoring and identification may become more difficult. In the context of Jewish survival during the Holocaust, urban anonymity could therefore have reduced the effectiveness of local scrutiny and accusation, particularly when individuals attempted to conceal their identity.

The argument leads to the expectation that Jewish communities located in larger cities may have experienced higher survival rates, other things being equal. The hypothesis is stated as follows:

H1: Jewish survival rates are positively associated with the total population of the host city (POP), reflecting the potential importance of anonymity and institutional resources in larger urban environments.

Deportation Timing and Temporal Opportunity

The second theoretical argument concerns the timing of deportation. DAR measures the number of calendar days between the beginning of the deportation campaign in Greece and the onset of deportation in a particular community. It therefore provides a common temporal reference point for comparing communities that were subjected to deportation at different stages of the campaign.

The theoretical importance of this variable lies in the information and preparation opportunities associated with later deportation. Communities targeted at the beginning of the deportation campaign had little opportunity to observe what had happened elsewhere. Communities targeted later, by contrast, could potentially learn from the experiences of communities that had already been

deported. Information about arrests, deportations, German procedures, escape routes, false documentation, or the availability of assistance could make it possible to prepare a response before deportation occurred.

The relationship should not, however, be interpreted as a simple measure of “time available for rescue.” Later deportation did not automatically create effective opportunities for survival. Communities had to receive relevant information, interpret the threat correctly, and possess or develop the social networks and institutional resources necessary to act upon it. Moreover, deportation timing was itself influenced by broader occupation policies, geographical conditions, and the organization of German and allied authorities. DAR is therefore treated as a proxy for temporal opportunity rather than as an exogenous measure of rescue time.

The central expectation is nevertheless that, on average, communities deported later had more opportunity to organize a response to persecution. Such responses could take different forms, including concealment, flight, dispersal, acquisition of false documents, or integration into resistance and assistance networks. The corresponding hypothesis is:

H2: Jewish survival rates are positively associated with deportation timing (DAR), reflecting the greater opportunity for information, preparation, and protective action available to communities targeted later in the deportation campaign.

The Interaction between Urban Scale and Deportation Timing

The potential importance of city population and deportation timing also suggests that the two variables may not operate independently. The resources associated with a large city were unlikely to provide automatic protection. Anonymity, institutional diversity, and extensive social networks could become useful only if individuals had sufficient opportunity to identify these resources and mobilize them. Conversely, additional time may have been less valuable in communities that lacked the social networks or institutional capacity necessary to respond.

This reasoning suggests a possible interaction between urban scale and deportation timing. Later deportation could increase the opportunity to make use of the resources available in larger cities, while the advantages associated with urban scale could make additional time more productive. The interaction hypothesis is therefore:

H3: The association between host-city population and Jewish survival varies with deportation timing, such that the relationship between population size and survival may be stronger when communities had more time to obtain information and organize protective measures.

These hypotheses provide the theoretical basis for the quantitative analysis presented in Section 4. The qualitative evidence examined in Section 5 complements the statistical analysis by identifying the local actors, institutions, and circumstances through which the hypothesized relationships may have operated.

Data and Descriptive Statistics

Table 1 reports the Jewish population, total population of the host city, deportation dates, and survival rates for 24 Greek Jewish communities for which the relevant population data are available. Zakynthos (Zante) is included for historical completeness but is excluded from the regression analysis. Unlike the other communities in the dataset, the Jewish community of Zakynthos was never deported because the German withdrawal from the island preceded the planned deportation. Consequently, deportation timing cannot be defined for Zakynthos. The econometric analysis therefore uses 23 city-community observations.

Before the Holocaust, the Jewish population of the 23 observations in the regression sample totaled 75,202, representing approximately 2.13% of the combined population of the host cities. Of these Jews, 6,823 remained after deportation, corresponding to an overall survival rate of 9.07%. When Zakynthos is included, the number of survivors rises to 7,098 and the overall survival rate to 9.40%. The substantial variation in both Jewish and host-city populations, deportation dates, and survival rates provides the basis for the subsequent statistical analysis.

Total City Population (POP)

The variable POP measures the total population of each host city according to the 1940 Greek census. It is used as an indicator of urban scale and varies considerably across the sample, from 18,898 inhabitants in Veria to 1,124,109 in Athens. Thessaloniki had a population of 375,127 and was considerably smaller than Athens, but contained by far the largest Jewish population in the sample.

The variation in host-city population provides an opportunity to examine whether the demographic scale of the surrounding urban environment was associated with Jewish survival. The raw data do not, however, reveal a simple relationship between city size and survival. Both relatively large and relatively small cities experienced very high as well as very low survival rates. POP should therefore be interpreted as a broad measure of urban scale rather than as a direct measure of anonymity, institutional capacity, or any other specific mechanism.

Jewish Population Before Deportation (NJB)

NJB records the size of the Jewish population in each community before deportation. The variable varies substantially across the sample. Thessaloniki is by far the largest community, with approximately 56,000 Jews, followed by Athens (3,000), Kavala (2,100), Corfu (2,000), and Ioannina (1,850). Most of the remaining communities had fewer than 1,200 Jewish inhabitants.

The large variation in NJB is important for describing the scale of the communities under investigation, although NJB is not included as a principal explanatory variable in the regression models. The raw data do not indicate a simple relationship between the initial size of the Jewish population and survival. Athens, for example, had 3,000 Jewish inhabitants and a survival rate of 66.67%, whereas Thessaloniki, despite having by far the largest Jewish population, had a survival rate of only 3.48%.

Jewish Population After Deportation (NJA)

NJA measures the number of Jews recorded as remaining after the deportation in each community. It ranges from three individuals in Nea Orestias and Soufli and in Serres to 2,000 in Athens and 1,950 in Thessaloniki.

Because the absolute number of survivors is mechanically related to the initial size of the Jewish population, NJA alone is not suitable for comparing survival across communities of very different sizes. The analysis therefore uses the ratio of NJA to NJB to construct the survival-rate variable.

Survival Rate (SURV)

The dependent variable SURV measures the proportion of the pre-deportation Jewish population that remained after deportation:

$$\text{SURV} = \text{NJA} / \text{NJB}$$

Survival rates vary dramatically across the communities. Among the 23 observations included in the regression analysis, the rate ranges from 0.50% in Serres to 73.97% in Volos. Several communities recorded survival rates above 50%, including Volos (73.97%), Trikala (69.23%), Athens (66.67%), Larissa (64.82%), and Patras-Agrinio (57.36%). By contrast, most communities deported at the beginning of the deportation campaign had survival rates below 5%.

When Zakynthos is included, the maximum survival rate is 100%, since all 275 recorded members of the community survived. Because the community was not deported, however, this observation is excluded from the regression analysis. The substantial variation in SURV constitutes the principal outcome to be explained by the empirical analysis.

Deportation Date

The variable “Deportation Began” records the date on which deportation began in each community. The dates reveal a highly uneven temporal progression of the deportation of Greek Jews. The earliest deportations in the dataset began on 4 March 1943, while many communities were not deported until 25 March 1944, approximately one year later. Other communities were deported at intermediate dates, notably Thessaloniki, Florina, and Veria in March 1943.

The variation in deportation dates provides the temporal basis for constructing the DAR variable. It is important to note, however, that deportation timing was not randomly assigned across communities. Differences in timing were related to broader occupation policies, geographical conditions, and the organization of German and allied authorities. Deportation timing should therefore not be interpreted independently of these contextual factors.

Table 1. *Jewish Population, Deportation Dates, and Survival in Greek Cities*

	Community	Total City Population (POP)	Jewish Population before (NJB)	Jewish Population after (NJA)	Survival rate (SURV)	Deportation Began	Days Available for Rescue (DAR)
1	Alexandroupolis	36716	140	4	2.86%	04-Mar-43	1
2	Arta	65175	384	60	15.63%	25-Mar-44	388
3	Athens	1124109	3000	2000	66.67%	25-Mar-44	388
4	Chalkis	79789	325	170	52.31%	25-Mar-44	388
5	Chania/Heraklion	294011	350	7	2.00%	21-May-44	445
6	Corfu	111548	2000	187	9.35%	10-Jun-44	465
7	Didymoteicho	46528	900	33	3.67%	04-Mar-43	1
8	Drama	145089	1200	39	3.25%	04-Mar-43	1
9	Florina	87931	400	64	16.00%	15-Mar-43	12
10	Ioannina	162150	1850	163	8.81%	25-Mar-44	388
11	Kastoria	68237	900	35	3.89%	25-Mar-44	388
12	Kavala	63603	2100	42	2.00%	04-Mar-43	1
13	Komotini	79977	819	28	3.42%	04-Mar-43	1
14	Larissa	76821	1120	726	64.82%	25-Mar-44	388
15	Nea Orestias and Soufli	67536	197	3	1.52%	04-Mar-43	1
16	Patras-Agrinio	159822	265	152	57.36%	25-Mar-44	388
17	Preveza	41486	250	15	6.00%	25-Mar-44	388
18	Serres	92135	600	3	0.50%	04-Mar-43	1
19	Thessaloniki	375127	56000	1950	3.48%	15-Mar-43	12
20	Trikala	83775	520	360	69.23%	25-Mar-44	388
21	Veria	18898	460	131	28.48%	15-Mar-43	12
22	Volos	112012	872	645	73.97%	25-Mar-44	388
23	Xanthi	98575	550	6	1.09%	04-Mar-43	1
	Total 23 cities (regression sample)	3491050	75202	6823	9.07%		
24	Zakynthos (Zante)	41165	275	275	100%	No deportation	n.a. (infinite)
	Total 24 cities	3532215	75477	7098	9.40%		

Source: Total city population figures are from the 1940 Greek Population Census. The Jewish population figures are from Saltiel (2020).

Deportation Timing (DAR)

DAR measures the number of calendar days from 4 March 1943, the date on which the first deportations in the dataset began, to the date on which deportation began in each community. The variable uses the convention that 4 March 1943 is coded as day 1. Thus, a value of 1 indicates that deportation began at the outset of the deportation campaign, whereas a value of 388 indicates that deportation began 388 calendar days later according to this counting convention.

DAR is used as a proxy for the temporal opportunity available to communities to observe earlier deportations, obtain information, and potentially organize a response. It does not measure the actual amount of time spent on rescue or the effectiveness of protective actions. In particular, communities with later deportation dates may also differ systematically from earlier-deported communities in occupation regime, geography, distance from German administrative centers, accessibility, resistance strength, local government behavior, Jewish communal organization, and pre-existing political networks. DAR should therefore be interpreted as a measure of deportation timing rather than as an exogenous measure of “rescue time.”

The variable ranges from 1 to 465 among the 23 communities in the regression sample. The distribution is highly uneven: eight communities have $DAR = 1$, three have $DAR = 12$, ten have $DAR = 388$, one has $DAR = 445$, and one has $DAR = 465$. Thus, although DAR is expressed in days, the sample contains only five distinct deportation-timing values. This feature is important for interpreting the regression results, particularly the estimated nonlinear relationship, because the analysis effectively compares a small number of deportation waves rather than a continuously distributed set of independent timing observations.

The concentration of observations at particular dates also reflects the historical organization of the deportations. In particular, the large group of communities with $DAR = 388$ was deported on 25 March 1944. The late deportation of many communities formerly located in the Italian occupation zone was related to the Italian armistice of 8 September 1943 and the subsequent German assumption of control. The timing of deportation therefore reflects both temporal opportunity and broader changes in the occupation regime.

Summary of the Data

Table 1 summarizes the principal variables used in the analysis. The dataset combines demographic information on Jewish communities and their host cities with the timing of deportation. The resulting sample exhibits substantial variation in survival rates, urban population, Jewish population, and deportation timing. At the same time, the concentration of DAR values in a small number of deportation waves and the historical factors associated with those waves are important qualifications for the econometric analysis.

The next section describes the regression methodology and examines whether the variation in deportation timing and host-city population is statistically associated with differences in Jewish survival rates.

Regression Methodology and Results

Empirical Methodology

Because the dependent variable is a proportion bounded between zero and one, alternative nonlinear specifications could in principle be considered. However, given the reconstructed historical nature of the numerator and denominator, the small sample size, and the absence of a clearly specified individual-level binomial data-generating process, the analysis uses OLS as a transparent reduced-form specification. The results should consequently be interpreted as associations rather than as a structural probability model.

The choice of an appropriate covariance estimator for statistical inference depends critically on the structure of the data and the likely form of departures from the classical OLS assumptions. White (1980) introduced the original heteroskedasticity-consistent (HC0) covariance matrix estimator, which produces asymptotically valid standard errors under heteroskedasticity of unknown form without requiring the researcher to specify its functional form.

However, subsequent research demonstrated that HC0 standard errors tend to be biased downward in finite samples, particularly when the sample size is small and when the regressors exhibit substantial leverage, leading to test statistics that reject the null hypothesis too frequently (MacKinnon & White, 1985).

MacKinnon and White (1985) proposed a family of finite-sample-corrected alternatives, including HC1, HC2, and HC3, which differ in how they adjust each observation's squared residual for its leverage before it enters the covariance calculation. Long and Ervin (2000), in an extensive Monte Carlo evaluation, showed that HC3 consistently outperforms HC0, HC1, and HC2 in samples of fewer than 250 observations, and specifically recommended HC3 as the preferred default for applied work with small cross-sectional samples, a recommendation subsequently reinforced by Cribari-Neto and da Silva (2011), who extended the HC framework further while confirming the superior finite-sample performance of leverage-adjusted estimators such as HC3 relative to the unadjusted White estimator.

Given the well-documented finite-sample limitations of unadjusted or HAC-based inference (MacKinnon & White, 1985; Long & Ervin, 2000), and consistent with general guidance on robust inference in small non-experimental samples), we treat HC3 as the more conservative and appropriate basis for inference here, while emphasizing that the small sample size ($N=23$) constrains statistical power regardless of estimator.

This literature is directly relevant to the present analysis, which is based on a cross-section of only 23 Greek cities and includes at least one observation, Athens, with substantially higher leverage than the rest of the sample due to its exceptionally large population relative to the other cities. Given both the small sample size and this documented high-leverage observation, HC3 is the standard-error estimator best supported by the applied econometrics literature for this dataset.

A separate consideration concerns the distinction between heteroskedasticity-consistent (HC) and heteroskedasticity-and-autocorrelation-consistent (HAC) covariance estimators, such as the Newey-West estimator (Newey & West 1987), which is

commonly reported in applied regression output, including by default in several econometric software packages.

HAC estimators are designed for settings in which observations possess a meaningful natural ordering, typically time, along which the correlation between residuals can plausibly be expected to decay with increasing distance (Newey & West 1987). The Bartlett-kernel weighting scheme underlying the Newey-West estimator, together with automatic bandwidth-selection procedures such as that of Andrews (1991), explicitly exploits this ordering to determine how much weight to place on the covariance between nearby versus distant observations.

In a cross-sectional sample such as the one employed here, however, the sequence in which observations are listed, whether alphabetically by city name or by an arbitrary identification number, carries no economic meaning, and there is no structural reason to expect the persecution or survival experience of one city to be more correlated with the city immediately preceding or following it in the dataset than with any other city in the sample.

Applying a HAC estimator under these conditions therefore corrects for a form of dependence that is unlikely to reflect any genuine feature of the data-generating process, while incurring the well-documented cost of AC-robust estimators in small samples, namely a further loss of precision beyond what is required to address heteroskedasticity alone.

For these reasons, and following the recommendations of Long and Ervin (2000) and Davidson and MacKinnon (1993), this study reports HC3 heteroskedasticity-consistent standard errors as its primary basis for statistical inference, rather than the HAC estimator conventionally reported for time-series or panel applications.

Empirical Results

Table 2 reports four versions of the survival-rate regression, designed to illustrate both the substantive findings of the paper and the sensitivity of statistical inference to the choice of standard-error estimator discussed in the preceding methodological section. Specifications 1 and 2 estimate an identical equation, SURV regressed on DAR, DAR^2 , POP, and the interaction term $POP \times DAR$; they report identical coefficients, R^2 , adjusted R^2 , and all other goodness-of-fit statistics, differing only in the covariance estimator used to compute standard errors. Specification 1 uses Newey-West HAC standard errors with Andrews (1991) automatic bandwidth selection, while Specification 2 uses the small-sample, leverage-adjusted HC3 estimator recommended for cross-sectional data of this size by Long and Ervin (2000) and Cribari-Neto and da Silva (2011). Variance inflation factor diagnostics (EViews 14, centered VIF) indicate substantial multicollinearity between DAR and DAR^2 (VIF = 217.9 and 222.2, respectively), consistent with the sensitivity of the quadratic specification to the exclusion of Corfu reported in Table 3. POP and the interaction term $POP \times DAR$ show no comparable collinearity (VIF = 2.4 and 3.3), indicating that their loss of significance under HC3 reflects estimation uncertainty in a small, high-leverage sample rather than collinearity with the other regressors.

Table 2. Regression Equations (Dependent variable: survival rates)

Variables	Specification 1	Specification 2	Specification 3	Specification 4
C	0.0666 (1.99) [0.062]	0.0665548 (1.7356086) [0.0997201]	0.034819 (1.570048) [0.132091]	0.06168882 2.323955747 0.030777571
DAR	0.0062 (2.93) [0.009]	0.0061695 (1.8296369) [0.0839182]	0.006330 (2.364423) [0.028285]	0.000803912 3.011224086 0.006899289
DAR ²	-1.39E-05 (-2.88) [0.01]	-1.39E-05 (-1.6638709) [0.1134501]	-1.38E-05 (-2.133522) [0.045455]	
POP	-3.18E-07 (-1.84) [0.082]	-3.18E-07 (-1.0594056) [0.3034250]		
POP*DAR	1.48E-09 (2.96) [0.008]	1.48E-09 (1.3771680) [0.1853466]		
R-squared	0.5158	0.5158	0.46891	0.344980809
Adjusted R-squared	0.4082	0.4082	0.41580	0.312229849
S.E. of regression	0.2063	0.2063	0.20498	0.226513393
Sum squared resid	0.7661	0.7661	0.84032	1.026166343
Log likelihood	6.4864	6.4864	5.42329	2.500690783
F-statistic	4.7938	4.7938	8.82918	10.53345654
Prob(F-statistic)	0.0083	0.0083	0.00179	0.004051904
Wald F-statistic	37.6	3.8	6.7	8.0
Prob(Wald F-statistic)	1.65e-08	0.0196	0.0059	0.0100
Durbin-Watson stat	1.69	1.69	1.76	1.837195573
Akaike info criterion	-0.1293	-0.12925	-0.2107	-0.045517344
Schwarz criterion	0.1176	0.117596	-0.0626	0.053668334
Number of Cities	23	23	23	23

Notes: In parentheses t-values and in square brackets probabilities. Specification 1 was estimated using HAC standard errors & covariance (Bartlett kernel, Andrews bandwidth = 0.6761). Specifications 2 and 3 were estimated using Davidson-MacKinnon (HC3) heteroskedasticity-consistent standard errors & covariance. Specifications 1 and 2 report identical point estimates and fit statistics, since both estimate the same equation; they differ only in the method used to compute standard errors, illustrating the sensitivity of statistical inference — though not the coefficients themselves — to the choice of covariance estimator.

Specification 3 estimates a simplified equation, dropping POP and the interaction term, and is likewise estimated using HC3 standard errors. The contrast between Specifications 1 and 2 is substantively important. Under HAC standard errors, DAR ($p = 0.009$), DAR² ($p = 0.010$), and the interaction term POP×DAR ($p = 0.008$) are all significant well below the 5% level, and POP itself is significant at the 10% level ($p = 0.082$), producing what appears to be strong, broad-based support for all three of the paper's hypotheses. Under HC3 standard errors, applied to the identical coefficients, this picture changes considerably: DAR remains only marginally significant ($p = 0.084$), while DAR² ($p = 0.113$), POP ($p = 0.303$), and the interaction term ($p = 0.185$) all lose statistical significance entirely. As discussed above, this divergence is consistent with the finding of MacKinnon and White (1985) that unadjusted or autocorrelation-based standard errors can substantially understate estimation uncertainty in small samples, particularly in the presence of high-leverage

observations; Athens, whose population of 1,124,109 is more than three times that of the next-largest city in the sample, is precisely the kind of high-leverage observation this literature warns against. The fact that HAC standard errors, which were not designed to account for leverage in a cross-section at all, produce the most favorable results for the paper's hypotheses is itself a signal that those results should be treated with caution rather than taken as the primary finding.

Specification 3 addresses this directly by simplifying the model to include only DAR and DAR^2 , the two variables that retain at least marginal explanatory relevance once HC3 standard errors are applied, and re-estimating under HC3. The simplified specification provides a more parsimonious model and is modestly preferred by the information criteria and adjusted R^2 .

The coefficients in Specification 3 imply a curvilinear relationship between the number of days available for rescue and the probability of survival. The estimates suggest a concave relationship, with an estimated turning point at approximately 230 days. However, the leave-one-out analysis (Table 3) indicates that the evidence for concavity is sensitive to the inclusion of Corfu, the latest-deported community in the sample.

In percentage-point terms, a 100-day increase in DAR is associated with an increase in the survival rate of approximately 6.3 percentage points at low values of DAR, an effect that diminishes and eventually turns negative as DAR approaches and exceeds 230 days. This pattern is consistent with the qualitative case evidence discussed in section five: communities that learned of their impending persecution earlier than the March 1943 baseline, such as those deported in the initial wave, had essentially no opportunity to organize a rescue response, while communities with a moderate delay were able to draw on the precedent of earlier deportations to organize flight to the mountains or into hiding. The eventual downturn beyond 230 days may reflect the fact that the very longest delays, such as that experienced by Corfu, were concentrated in communities where local administrative collaboration with the occupying authorities, rather than lack of time, determined the outcome, as discussed further in section five.

Specification 4 estimates a linear version of the parsimonious model, including only DAR and the constant. It is reported as a robustness benchmark for assessing whether the positive association between deportation timing and survival depends on the quadratic specification.

Taken together, Table 2 supports two conclusions central to the paper's argument. First, the evidence provides suggestive support for a nonlinear association between deportation timing and survival, although the estimates remain sensitive to model specification and the small sample size. Second, the paper's hypotheses regarding population size (H1) and its interaction with time available for rescue (H3) are not supported with statistical confidence once estimation uncertainty is properly accounted for, notwithstanding their apparent significance under HAC standard errors and their consistency with the theoretical framework developed in section two. This does not imply that population size played no role in Jewish survival in Greece; rather, it indicates that a sample of 23 cities lacks the statistical power to confirm this relationship with confidence, given the disproportionate influence of a single large city in the sample. The qualitative case evidence presented in section five, rather than the regression results, therefore provides the primary

support for the role of city size and its interaction with time available for rescue advanced in this paper.

A further question is whether the estimated DAR relationship is driven by a single influential observation. Table 3 reports a leave-one-out sensitivity analysis for the quadratic specification SURV regressed on C, DAR and DAR², estimated with Davidson-MacKinnon HC3 heteroskedasticity-consistent standard errors (Long & Ervin 2000).

Table 3. *Robustness - Leave-One-Out Sensitivity for Quadratic Specification*

Excluding Variable	None Baseline	Chalkis POP 79,789	Corfu POP 111,548	Athens POP 1,124,109	Thessaloniki POP 375,127	Corfu Linear C DAR
C	0.03482 (1.570) [0.1320]	0.0356 (1.582) [0.1300]	0.02727 (1.063) [0.3008]	0.03658 (1.623) [0.1209]	0.04180 (1.896) [0.0732]	0.06168 (2.323) [0.0307]
DAR	0.006329 (2.364) [0.0282]	0.006133 (2.209) [0.0396]	0.008300 (1.683) [0.1086]	0.005865 (2.173) [0.0425]	0.006364 (2.294) [0.0333]	0.000803 (3.011) [0.0068]
DAR ²	-1.38E-05 (-2.133) [0.0454]	-1.33E-05 (-2.012) [0.0585]	-1.88E-05 (-1.517) [0.1456]	-1.28E-05 (-1.977) [0.0626]	-1.39E-05 (-2.067) [0.0525]	-
R-squared	0.4689	0.441808054	0.479319796	0.436544808	0.461051423	0.344980809
Adjusted R-squared	0.41580	0.383051008	0.424511353	0.377233735	0.404319993	0.312229849
N	23	22	22	22	22	22

Notes: Dependent variable: SURV. Specification: C DAR DAR². Estimator: OLS with Davidson-MacKinnon HC3 heteroskedasticity-consistent SEs. N=22 when one city excluded, N=23 baseline. Chalkis SURV 52.31% DAR 388 high survival; Corfu DAR 465 latest deportation; Athens POP 1.12M high leverage; Thessaloniki POP 375k largest pre-war Jewish population NJB. Excluding Athens, Chalkis, Thessaloniki DAR remains significant at 5% HC3. Excluding Corfu quadratic loses significance (DAR p=0.108, DAR2 p=0.145) but linear DAR remains significant at 1% (p=0.0068, last column), confirming linear time effect is robust while curvature identification depends on late-deportation tail.

Each column excludes one potentially influential city identified on substantive and statistical grounds. Athens is excluded as a high-leverage outlier in terms of total city population [1,124,109 versus a mean of 107,588 for the remaining 22 cities], Thessaloniki as the second-largest city and the largest pre-war Jewish community in Greece [375,127 total population], Chalkis as a high-survival outlier at intermediate DAR [SURV 52.31% at DAR 388], and Corfu as the latest deportation in the sample [DAR 465].

Excluding Athens, Chalkis, or Thessaloniki leaves the results qualitatively unchanged: DAR remains significant at 5% with HC3 [p=0.0425, 0.0396 and 0.0333 respectively] and DAR² significant at 10% [p=0.0626, 0.0585 and 0.0525]. Excluding Corfu weakens the quadratic specification to DAR p=0.1086 and DAR² p=0.1456, indicating that identification of concavity depends on retaining the late-deportation tail. The linear effect itself is robust: when Corfu is excluded and the model is estimated as SURV on C and DAR only, DAR remains positive and highly significant at 1% with HC3 [coefficient 0.000803, t=3.01, p=0.0068, N=22, R²=0.345].

To assess the robustness of the results, a range of alternative specifications and measures of urban characteristics were examined. In addition to the baseline population measure (POP), the analysis considered the squared population term (POP²), the logarithm of population [ln(POP)], city altitude, and the share of the Jewish population in the total population of the host city. These variables were introduced separately and in alternative combinations to examine whether the estimated relationship between deportation timing and Jewish survival was sensitive to the way urban characteristics were measured. The inclusion of these alternative measures did not materially change the main econometric results. In particular, the positive association between deportation timing and survival remained, while the coefficients associated with city population and its alternative transformations were not consistently statistically significant. Given the small number of observations, these additional specifications are treated as robustness checks rather than as a basis for selecting a more complex model.

The most robust empirical finding is the positive association between deportation timing and Jewish survival. Evidence for a nonlinear relationship is suggestive but sensitive to the extreme late-deportation observations. By contrast, city population and its interaction with deportation timing do not receive statistically robust support in the 23-city sample.

Mechanisms of Survival across Greek Jewish Communities

The regression results identify systematic relationships between Jewish survival and the structural characteristics of the communities, particularly the time that elapsed before deportation reached each city. The aggregate statistical results, however, cannot capture the specific mechanisms through which individual Jews and their communities were able to avoid deportation. In this section we examine first selected literature on the theory and historiography of rescuing Jews in the Holocaust period and second apply this to the Greek Jewish Communities.

The Historical Evidence on Jewish Rescuing

Historical evidence indicates that survival depended on a variety of strategies, including the use of false identity documents, hiding, flight to mountainous or rural areas, dispersal among local populations, and assistance from resistance organizations and individual rescuers.

For example, Baron (1986) in a review survey examines non-Jewish who rescued Jews during the Holocaust, identifying two main approaches: historical studies of national/local conditions enabling rescue (e.g., Denmark, Bulgaria, France), and psycho-social studies profiling individual rescuers through interviews. Historical works link rescue rates to the nature of German occupation and native compliance or resistance. Psycho-social research examines rescuers' demographics, upbringing, social marginality, role models, religious/political values, and—most decisively—prior relationships with those saved. Baron notes some rescuers acted

from mixed or self-interested motives. He concludes that no study has yet successfully synthesized macro-historical and psychological explanations of rescue behavior.

Moore (2003) examines Jewish rescue in Nazi-occupied Western Europe, focusing on the Netherlands and comparing it with Belgium and France—countries with strikingly different Jewish survival rates (25% in the Netherlands vs. ~60% in Belgium and ~75% in France). He argues existing scholarship, dominated by sociological/psychological studies of individual rescuer motivation, neglects the broader social and administrative context shaping rescue possibilities. Moore highlights factors like differing occupation structures, population registration systems, Jewish self-help organizations, and community leadership (especially clergy) in mobilizing rescue networks. He also complicates the "righteous gentile" narrative, noting rescuers' mixed motives—including profit, religious conversion, and even sexual exploitation—alongside genuine altruism, and calls for more integrated historical-sociological analysis.

Oliner & Oliner (1988) drawing on interviews with over 700 European rescuers and non-rescuers ("bystanders"), the Oliners investigate why some ordinary people risked their lives to save Jews during the Holocaust while others remained passive. They find that rescuers were distinguished less by heroic impulse than by empathy, a sense of connection to others, and moral values instilled through upbringing—particularly by parental modeling of caring behavior. The book compares rescuers and bystanders systematically, offering both historical analysis (including a chapter by Lawrence Baron on national contexts) and psychological explanation, and became widely regarded as a landmark study of altruism under extreme conditions.

Guttstadt et al. (2016) central argument is that the neutral countries' responses to the Holocaust cannot be classified simply as either rescue or indifference. Their policies toward Jewish refugees and their own Jewish citizens were shaped by pragmatism, domestic politics, diplomatic pressure, and changing expectations about the war's outcome. The editors emphasize considerable ambivalence and inconsistency, challenging postwar "rescue myths" and simplistic national narratives. A comparative approach therefore reveals a spectrum ranging from humanitarian assistance to restrictive policies and inaction, requiring a more nuanced assessment of neutrality during the Holocaust.

Jones (1998) uses Oskar Schindler as a case study to examine Holocaust rescue through the economic concept of "amenity potential," derived from Harold Demsetz (1983). The concept refers to the opportunities created by controlling a firm's resources: an owner can deploy those resources for purposes beyond profit maximization, within legal and market constraints. Jones argues that Schindler's control over factories, labor, money, and business relationships gave him unusual opportunities to protect Jewish workers. His rescue efforts therefore cannot be understood solely as altruism or moral transformation; they were made possible by his economic position and control of organizational resources. Schindler initially operated within the Nazi economic system and benefited from it, but subsequently used the resources accumulated through his businesses to circumvent or manipulate that system, including through bribes, employment arrangements, and the relocation of his workers. Jones thus presents rescue as partly a problem of rational choice under institutional constraints, showing how economic resources could create opportunities for resistance even within a highly coercive system.

Varese and Yaish (2000) examine Holocaust rescue as a problem of matching the supply of potential rescuers with the demand of people needing help. Rather than treating rescue primarily as a consequence of altruistic personality or moral motivation, they emphasize opportunities, information, trust, and situational circumstances. Using secondary analysis of data on rescuers and non-rescuers, they find that a direct request for help substantially increased the probability of rescue. Potential rescuers also tended to help people they already knew or people referred through trusted intermediaries, reducing the risk of helping the “wrong” person. The authors therefore argue that many people may possess a greater capacity for altruistic behavior than observed rescue rates suggest. In economic terms, the problem is partly one of market failure in the provision of altruism: willing helpers and people in need may fail to find one another because of information and trust problems. Improving the mechanisms through which requests for assistance reach potential rescuers could therefore increase the amount of rescue.

Hoffman (2011) examines whether economic resources and income affected the probability that individuals would rescue Jews during the Holocaust. Using both cross-country data and individual-level data on rescuers and non-rescuers, he finds a strong positive relationship between wealth and rescue: richer countries had more rescuers, and within countries, wealthier individuals were more likely to rescue Jews. Importantly, the individual-level relationship remains after controlling for practical measures of the ease of rescue, such as the number of rooms in a household. Hoffman therefore argues that the result cannot be explained simply by wealthier people having more physical capacity to hide Jews. Since wealthier individuals arguably also had more to lose from being caught, the findings are consistent with the broader proposition that altruism increases with income. The paper thus introduces an important economic dimension to Holocaust rescue, suggesting that the capacity and willingness to bear the costs and risks of helping others were partly associated with economic status.

A Theoretical Framework for Rescue and Survival

The historical literature reviewed above suggests that Jewish rescue can be understood as the outcome of an interaction between the availability of potential rescuers and the ability of Jews to identify and exploit opportunities for survival. This perspective integrates the psychological, historical, sociological, and economic explanations of rescue without assuming that either the characteristics of rescuers or those of Jewish victims alone determined survival.

On the rescuer side, the probability of assistance was influenced by moral values, empathy, prior relationships, social networks, economic resources, and the institutional environment. Oliner and Oliner (1988) emphasize empathy and moral socialization; Baron (1986) and Moore (2003) stress the importance of local political and institutional conditions; Varese and Yaish (2000) highlight the importance of information, trust, and direct requests for assistance; while Jones (1998) and Hoffman (2011) demonstrate that economic resources could increase the capacity or willingness to undertake rescue. Rescue therefore depended not simply on whether individuals were altruistic,

but also on whether they possessed the resources, social connections, and opportunities necessary to act.

At the same time, survival depended on characteristics and decisions on the Jewish side. Jews differed in their access to information, mobility, financial resources, social networks, and ability to reach locations where hiding or escape was possible. Particularly important was the recognition of the threat. Individuals or communities that underestimated the severity or imminence of persecution could delay flight or concealment, thereby reducing the opportunities available to them once deportation operations began. Conversely, early recognition of the danger could allow individuals to obtain false documents, leave urban areas, establish hiding places, contact resistance organizations, or seek assistance from local populations.

The resulting process can therefore be understood as one of opportunity and matching. Potential rescuers needed both the willingness and the capacity to provide assistance, while Jews needed to recognize the danger and establish access to people or networks capable of providing it. Social relationships and intermediary organizations could connect the two sides. The effectiveness of this process was further conditioned by geography, local institutions, the degree of German control, and the availability of safe locations.

This framework gives particular importance to time. Additional time did not automatically produce rescue or survival. Rather, it increased the number of opportunities available for the different components of the survival process to operate. More time could permit the recognition of the threat, the organization of escape, the acquisition of false documents, the establishment of hiding places, the mobilization of resistance networks, and the development of relationships between Jews and potential rescuers. Time could therefore be converted into survival when the necessary social, economic, geographical, and institutional conditions were present.

The framework also helps explain why communities exposed to similar temporal conditions could nevertheless experience very different survival outcomes. A longer period before deportation increased the potential opportunity set, but the extent to which that opportunity was realized depended on the availability of rescuers, the organization of assistance, the willingness of local populations to help, the accessibility of rural or mountainous refuge, and the ability of Jews to respond to the emerging threat. Conversely, a short period before deportation could sharply restrict these possibilities, particularly when German authorities exercised effective control or when the population was too large to disperse rapidly.

The qualitative evidence presented below is consistent with this framework. The cases do not permit direct estimation of the individual mechanisms identified in the theoretical literature. Instead, they illustrate how additional time could create opportunities for organized assistance, flight, hiding, and dispersal, and why those opportunities were converted into survival in some communities but not in others. The purpose of the case evidence is therefore to identify plausible mechanisms underlying the statistical relationship between deportation timing and Jewish survival, rather than to provide an independent causal test of the regression results.

Rescuing Greek Jews

Table 4 summarizes the principal mechanisms of survival identified for the communities in the sample and the main actors involved. The cases provide qualitative evidence of the mechanisms described in the theoretical framework above. In particular, they illustrate how additional time before deportation could create opportunities for flight, hiding, dispersal, the acquisition of false documents, and the organization of assistance. They also demonstrate that the availability of time was not sufficient by itself: its value depended on the existence of social networks, willing rescuers, resistance organizations, accessible rural or mountainous refuge, and the ability of Jews to recognize and respond to the threat.

The case evidence is not intended to provide an independent causal test of the regression coefficients. Rather, it is used to identify plausible mechanisms consistent with the statistical association between deportation timing and survival and to illustrate why communities exposed to similar temporal conditions nevertheless experienced different outcomes. The cases therefore provide a bridge between the aggregate statistical relationship and the historical processes through which time could be converted into survival.

Organized Assistance and Resistance

The most striking cases are Athens, Volos, Larissa, Trikala, Zakynthos, Chalkis, Patras and Agrinio, where survival involved organized assistance rather than isolated individual escapes. Bowman (2003) discusses the case of Chalkis, on the island of Evia. Athens is particularly important because survival involved several mechanisms simultaneously—false identity papers, hiding, escape to the Middle East, and participation in resistance networks—with Archbishop Damaskinos and Police Chief Angelos Evert among the prominent figures associated with efforts to protect Jews.

Volos similarly illustrates the importance of cooperation among religious leaders, resistance organizations, and the local population. These cases suggest that the availability of time was potentially valuable not merely because individuals could flee spontaneously, but because additional time allowed networks of assistance to organize more effective collective responses.

Flight and Dispersal into Rural Areas

A second mechanism was the physical dispersal of Jewish communities into mountainous and rural areas. Volos, Larissa, Trikala, Arta, and Agrinio provide examples in which Jews escaped from the urban environment and sought refuge in villages or mountainous areas. The case of Agrinio is particularly notable because the community was dispersed among surrounding villages, while in Veria Jews were hidden in the nearby village of Sykia.

These cases highlight the importance of the relationship between urban Jewish communities and their surrounding rural populations. Survival could therefore depend not only on the resources available within a city but also on whether Jews could reach locations where German authorities had less effective control and where local inhabitants were willing to provide assistance.

Table 4. *Mechanisms of Survival across Greek Jewish Communities*

Community	Documented/Reported Means of Survival	Principal Actors Reported in the Historical Literature
Athens	False identity papers, hiding, escape to Middle East, resistance	Archbishop Damaskinos, Police Chief Angelos Evert, resistance networks
Volos	Flight to mountain villages, resistance protection	Rabbi Moses Pesach, Archbishop Ioakeim, EAM/ELAS
Larissa	Flight to mountains, hiding by villagers, resistance	EAM/ELAS and local population
Trikala	Flight to mountains and hiding	Resistance and local population
Zakynthos	Entire community hidden	Mayor Loukas Karrer, Bishop Chrysostomos and islanders
Chalkis	Hiding and evacuation before arrests	Local population and resistance
Patras	Hiding and flight	Resistance networks
Agrinio	Entire community dispersed to villages	Local population and resistance
Veria	Hidden in nearby village of Sykia	Local villagers
Thessaloniki	Small number escaped before deportations or survived camps	Individual rescue efforts and resistance
Ioannina	Limited escapes before deportation	Individual rescuers
Corfu	Some hid in villages or escaped	Local assistance
Kavala	Very few escaped before deportation	Individual efforts
Drama	Very few escaped	Individual efforts
Serres	Very few escaped	Individual efforts
Komotini	Very few escaped	Individual efforts
Xanthi	Very few escaped	Individual efforts
Kastoria	Few escaped before deportations	Individual efforts
Arta	Hiding and flight to mountains	Resistance and villagers
Preveza	Hiding	Local population
Chania/Heraklion	A few survivors were absent from the island or escaped	Individual circumstances

Source: Author's compilation based on the historical literature: Antoniou (2018), Apostolou (2018), Bantiou (2026), Blümel (2021), Bowman (2003, 2009), Chandrinos & Droumpouki (2018), Droumpouki (2016), Fleming (2008), Kerem (2012), Naar (2016), Schminck-Gustavus (2023), Spyros (2019), and Tzafleris (2019).

Note: Table 4 includes Zakynthos for qualitative comparison despite its exclusion from the regression sample (see Limitations); Patras and Agrinio are presented separately here to reflect distinct local rescue histories, though combined as a single observation in the regression. Alexandroupolis, Didymoteicho, Florina, and Nea Orestias-Soufli are omitted from Table 4 due to limited documented case-level detail in the sources consulted.

Limited Opportunities for Escape

At the other end of the spectrum are communities such as Kavala, Drama, Serres, Komotini, Xanthi, Kastoria, and Didymoteicho, where only a very small number of Jews escaped before deportation. These communities generally experienced extremely low survival rates. The contrast with communities such as Volos, Larissa, Trikala, and Zakynthos suggests that survival was not simply a function of the size of the Jewish population. Rather, opportunities for escape and hiding depended on the time available, the possibility of reaching safe locations, the willingness of the local population to provide assistance, and the existence of organized resistance or rescue networks.

The Exceptional Case of Zakynthos

Zakynthos represents the most exceptional case in the sample. The entire Jewish community was hidden rather than deported, resulting in a survival rate of 100 percent. This remarkable outcome involved cooperation among Mayor Loukas Karrer, Bishop Chrysostomos, and the island's population. Unlike communities in which only a fraction of the Jewish population managed to escape or remain in hiding, Zakynthos demonstrates the potential importance of collective local action in protecting Jewish residents. The case is therefore both historically exceptional and statistically influential, and its experience should be considered separately when interpreting the regression results. For this reason, Zakynthos was excluded from the regression analysis.

Thessaloniki as a Distinctive Case

Thessaloniki constitutes a particularly important case because of the exceptional size of its Jewish population and the extremely low survival rate despite the existence of a period of 12 days between the beginning of deportations on 4 March 1943 and the beginning of deportation in Thessaloniki. The literature on the history of the Jews of Thessaloniki is extensive; see, among others, Mazower (2005), Naar (2016), Papamichos Chronakis (2018), Rozen (2005), and Saltiel (2014, 2020).

Mazower (2005) provides important historical context for understanding the distinctive position of Thessaloniki's Jewish community before the Holocaust. For centuries under Ottoman rule, Thessaloniki was one of the principal centers of Sephardic Jewish life in the Mediterranean, and its Jewish population played a major role in the city's commercial, social, and cultural life. The incorporation of Thessaloniki into Greece in 1912, the arrival of large numbers of Christian Orthodox refugees after 1922, the Great Fire of 1917, and subsequent processes of urban reconstruction and Hellenization profoundly altered the city's demographic and social structure.

Nevertheless, on the eve of the Holocaust, Thessaloniki remained home to one of the largest and most institutionally developed Jewish communities in southeastern Europe. Mazower's account is therefore relevant to interpreting Jewish population size not merely as a demographic variable but also as an indicator of the scale of communal institutions, social networks, and economic resources available to the Jewish population. The destruction of Salonica's Jewish community under German occupation consequently represented not only a high

level of individual mortality but also the near-complete destruction of a long-established communal and urban social world (Mazower, 2005).

Papamichos Chronakis (2018) further highlights the complex social and national identity of Thessalonian Jews before and during the Holocaust. Focusing on Jews from Thessaloniki deported to Auschwitz, he shows that Jewish identity coexisted with a strong sense of Greek national belonging, challenging interpretations that portray the community as socially or nationally isolated from Greek society. This evidence is relevant to understanding the characteristics of the large Thessalonikian Jewish community, whose size was accompanied by extensive communal and social networks and a complex relationship with the broader Greek population. Thus, Jewish population size may capture not only demographic scale but also the institutional and social resources embedded in large and established Jewish communities.

The relationship between Jewish population size and survival was also mediated by the institutional and political characteristics of individual communities. Rozen (2005), in his study of Tzevi Koretz, Chief Rabbi of Thessaloniki from 1933 to 1943, illustrates the complex relationship between the city's Jewish community, its leadership, and the wider Greek political and social environment. His analysis highlights both the extensive institutional organization of Thessalonian Jewry and the controversies surrounding communal leadership on the eve of and during the Holocaust. This suggests that the size of a Jewish community should not be interpreted simply as a measure of the number of individuals at risk. Larger communities could also possess more developed communal institutions, leadership structures, and social networks, although these resources did not necessarily translate automatically into greater protection under conditions of systematic persecution (Rozen 2005).

The destruction of Jewish communal institutions provides further evidence of the broader social consequences of the Holocaust in Greece. Saltiel (2014) documents the destruction of Thessaloniki's historic Jewish cemetery in 1942, demonstrating how the persecution of Greek Jews extended beyond the physical targeting of individuals to the systematic destruction of the institutions and material structures associated with Jewish communal life. The cemetery represented centuries of Jewish presence in Thessaloniki and its destruction constituted an important step in the removal of the community's historical and cultural foundations. This case illustrates that the resources associated with a large Jewish population—including communal institutions, collective memory, and established social structures—could themselves become targets of persecution. Consequently, population size may capture both the demographic scale of a community and the institutional depth that characterized its prewar social organization, although these resources could be progressively dismantled as persecution intensified (Saltiel 2014).

Only a small number of Jews escaped before the deportation, while many of those who were deported subsequently died in the camps. The Thessaloniki case illustrates the limitations of a short period of warning when the Jewish community was exceptionally large and the deportation operation could be implemented on a massive scale. It also provides an important contrast with smaller communities that had more time to organize flight or hiding.

Overall Interpretation

Taken together, the historical evidence and the theoretical literature suggest that Jewish survival was the outcome of an interaction between opportunities created by time, the availability and capacity of potential rescuers, and the ability of Jews to recognize and exploit those opportunities. The literature on rescue demonstrates that assistance cannot be attributed to a single motivation. Empathy, moral values, prior relationships, religious and political beliefs, economic resources, and situational incentives could all influence the willingness and capacity of non-Jews to provide assistance (Baron 1986, Oliner & Oliner 1988, Jones 1998, Hoffman 2011).

At the same time, rescue depended on information, trust, and social connections that allowed potential rescuers and those seeking assistance to find one another (Varese & Yaish 2000). Historical studies further demonstrate that these individual characteristics operated within broader institutional and political environments that could either facilitate or constrain rescue (Baron 1986, Moore 2003, Guttstadt et al. 2016).

The Greek cases are consistent with this multidimensional interpretation. Communities such as Athens, Volos, Larissa, Trikala, Zakynthos, Chalkis, Patras, and Agrinio illustrate situations in which survival opportunities were converted into organized assistance, hiding, flight, or dispersal. The importance of resistance organizations, religious leaders, local authorities, villagers, and individual rescuers suggests that survival often depended on the existence of networks capable of mobilizing assistance rather than on isolated acts of individual altruism. The cases of Volos, Larissa, Trikala, and Agrinio, in particular, demonstrate how Jews could use additional time to move from urban communities to villages and mountainous areas where German control was weaker and assistance was available. Zakynthos provides the most striking example of collective local action, in which the entire Jewish community was protected.

The evidence also suggests that time operated as an enabling condition rather than as an independent mechanism of rescue. Additional time increased the opportunity to recognize the threat, establish contacts, obtain false documents, organize hiding places, mobilize resistance networks, and escape to safer locations. However, time could be converted into survival only when other conditions permitted action. A community might have additional time but limited survival opportunities if effective networks of assistance were absent, if local authorities cooperated with the occupiers, if safe locations were inaccessible, or if the population failed to respond sufficiently early to the threat. Conversely, where organized networks and willing local populations existed, even relatively small communities could use the available time effectively.

The historical evidence also points to an important victim-side dimension of the rescue process. Jews were not passive recipients of rescue. Their survival could depend on recognizing the seriousness of persecution, deciding when to flee or hide, mobilizing personal and communal networks, and reaching locations where assistance was available. Underestimating the threat could delay these actions and reduce the effective value of the time available. Thus, the same number of days

before deportation did not necessarily represent the same effective opportunity for survival across communities.

This perspective helps reconcile the apparent importance of both time and population size in the quantitative analysis. Population size may represent not only the number of individuals exposed to persecution but also differences in the scale and organization of communal institutions and social networks. Large communities could possess substantial social and economic resources, but they could also be more difficult to disperse and more visible to the authorities. Thessaloniki illustrates this ambiguity particularly clearly. Its extensive communal organization and social networks did not translate into large-scale escape when the deportation process was implemented rapidly and on a massive scale. The case therefore demonstrates that resources available to a community could not necessarily be mobilized when the time available for action was severely constrained.

The qualitative evidence consequently provides a plausible mechanism for interpreting the statistical relationship between deportation timing and survival. The regression does not identify which particular individuals acted as rescuers, why they acted, or why particular Jews successfully obtained assistance. Nor can the available data establish the relative importance of altruism, economic resources, social networks, threat perception, or geography. What the case evidence demonstrates is that additional time created an opportunity structure within which these mechanisms could operate. Where networks of assistance, favorable geography, willing local populations, and responsive Jewish communities were present, that opportunity could be transformed into actual survival. Where such mechanisms were absent or where deportation occurred rapidly, the opportunity to act was greatly reduced.

The central implication is therefore that time should be understood as a necessary but not sufficient condition for rescue and survival. Its effect was conditional on the social, economic, institutional, and behavioral resources available to both those offering assistance and those seeking it. The Greek cases thus complement rather than replace the econometric evidence: the statistical analysis identifies the importance of the temporal opportunity, while the historical evidence and the rescue literature indicate the mechanisms through which that opportunity could—or could not—be converted into survival.

Limitations

Several limitations should be acknowledged. First, the empirical analysis is based on a relatively small cross-sectional sample of 23 Greek cities. The limited number of observations necessarily reduces statistical power and constrains the number of explanatory variables that can be included simultaneously. The results should therefore be regarded as evidence of patterns within the observed communities rather than as precise estimates that can be readily generalized beyond the sample.

Second, the two principal explanatory variables, city population (POP) and days available for rescue (DAR), capture only a limited part of the processes that may have shaped survival. The theoretical and historical literature suggests that survival depended on a combination of rescuer characteristics and motivations, economic and

social resources, information, social networks, local institutions, geographical opportunities, Jewish responses to persecution, and the behavior of local and occupation authorities. These factors could not be measured consistently across all communities and are therefore not incorporated directly into the regression analysis. The qualitative evidence in section five is used instead to illustrate how such mechanisms may have operated.

Third, DAR is not a direct measure of the amount of time actually devoted to rescue. It measures the interval between the beginning of the deportation campaign in Greece and the beginning of deportation in a particular city. Its theoretical interpretation is therefore as a measure of the temporal opportunity structure available to a community. Additional time could allow Jews to receive information about deportations elsewhere, recognize the seriousness of the threat, establish contacts, obtain false documents, hide, flee, disperse, or seek assistance from resistance organizations and local populations. Whether these opportunities were actually utilized depended on conditions that are not directly observed in the quantitative data.

Fourth, DAR may also capture factors other than time itself. The timing of deportation could be related to differences in the organization of German occupation, local administration, geography, transportation, or the strategic importance of particular cities. Consequently, the estimated association between DAR and survival should not be interpreted as establishing that the passage of time alone produced higher survival.

Fifth, the linear and quadratic DAR terms are highly collinear. This reduces the precision with which their separate coefficients can be estimated and contributes to the sensitivity of the quadratic specification to the exclusion of individual observations, particularly Corfu. The evidence for curvature should therefore be interpreted as suggestive rather than as establishing a precise functional form for the relationship between time and survival.

Sixth, the historical data are subject to measurement and comparability problems. Jewish population figures, deportation dates, and numbers surviving or remaining after deportation have sometimes been reconstructed from different historical sources. Population movements before and during the occupation may also make it difficult to assign individuals unambiguously to particular communities. These issues introduce the possibility of measurement error in both the dependent and explanatory variables.

Finally, the qualitative evidence cannot resolve the causal mechanisms identified in the theoretical literature. The historical cases demonstrate that organized assistance, flight, hiding, dispersal, resistance networks, and local protection were important pathways to survival, but they do not allow the relative contribution of rescuer motivation, Jewish behavior, economic resources, social networks, geography, or other factors to be estimated. The case evidence should therefore be understood as mechanism-oriented historical evidence, rather than as an independent causal test of the regression results.

These limitations notwithstanding, the combination of econometric analysis and community-level historical evidence provides a useful framework for examining variation in Jewish survival across occupied Greece. The quantitative analysis identifies a systematic temporal pattern, while the historical evidence helps clarify the types of opportunities and mechanisms through which differences in deportation timing could have been translated into differences in survival.

Conclusions

This study examined the substantial variation in Jewish Holocaust survival rates across Greek cities by combining quantitative evidence from 23 city-community observations with historical case-study evidence. The analysis focused on two characteristics that may have shaped the capacity of Jewish communities to respond to persecution: the population of the host city and the timing of deportation. The results indicate that deportation timing is the most consistent statistical correlate of survival in the Greek sample. Communities deported later generally experienced higher survival rates, whereas the relationship between host-city population and survival is considerably weaker and does not remain statistically robust across the preferred specifications.

The importance of deportation timing should not, however, be interpreted as evidence that additional days mechanically or causally produced higher survival. Deportation timing was itself shaped by geographical, administrative, and occupation-related circumstances that may also have affected the possibilities for escape and concealment. Moreover, the small sample and the limited number of distinct deportation dates require caution in interpreting the regression coefficients. The evidence is therefore best understood as an association: communities whose deportation occurred later generally had a larger temporal opportunity to respond to the escalating persecution.

The historical evidence helps explain why this temporal opportunity could matter. Later deportation provided additional time for information about Nazi intentions to circulate, for individuals and families to assess the danger, and for communal and personal networks to organize responses. In different communities, this time was converted into concrete strategies including hiding, flight to rural and mountainous areas, dispersal among non-Jewish populations, acquisition of false identity documents, and assistance from resistance organizations, local officials, religious leaders, and individual rescuers. The contrast between communities with substantial survival and those deported rapidly illustrates that time was not itself a protective mechanism. Its value depended on whether individuals and communities possessed the social networks, information, geographical opportunities, and institutional support necessary to transform time into effective action.

The findings also qualify a simple population-size explanation of survival. A large urban population could provide anonymity, diverse social networks, economic resources, and institutional opportunities. At the same time, a large Jewish population could be more difficult to conceal or disperse and could attract greater administrative attention. Thessaloniki illustrates this tension particularly clearly: despite its extensive communal organization and social networks, the rapid implementation of deportation left very little opportunity to convert these resources into large-scale escape. Conversely, smaller communities could sometimes achieve substantial survival when geographical conditions, local assistance, resistance networks, and individual initiatives facilitated concealment or flight. Zakynthos, which was not deported and is therefore excluded from the regression analysis, represents the clearest historical boundary case of this interaction between local protection and survival.

More broadly, the Greek evidence suggests that Holocaust survival should not be understood through a single demographic characteristic or a simple distinction between rescuers and victims. Survival emerged from the interaction of temporal opportunity, local circumstances, social networks, institutional responses, geography, and individual agency. Jewish people were not passive recipients of rescue: they actively sought information, organized escape, obtained false identities, dispersed into safer areas, and mobilized relationships with non-Jewish individuals and organizations. At the same time, the effectiveness of these actions depended heavily on the willingness and capacity of surrounding populations and institutions to provide protection.

The principal contribution of this study is therefore to place the temporal organization of persecution alongside the demographic and social conditions that have traditionally received greater attention in studies of Holocaust survival. The Greek case demonstrates that the timing of deportation can be an important dimension of survival, but that time mattered because it created an opportunity for action rather than because it independently determined outcomes. Future research could extend this analysis by incorporating more detailed measures of Jewish population characteristics, occupation regimes, geographical accessibility, resistance networks, local administrative behavior, and non-Jewish assistance. Such evidence would make it possible to assess more precisely how temporal opportunity was transformed into survival across different communities.

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