

Athens Journal of Social Sciences

Quarterly Academic Periodical, Volume 13, Issue 2

Published by the Athens Institute

URL: <https://www.athensjournals.gr/ajss> Email:

journals@atiner.gr

e-ISSN: 2241-7737 DOI: 10.30958/ajss

April 2026

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The ***Athens Journal of Social Science (AJSS)*** is an Open Access quarterly double-blind peer reviewed journal and considers papers from all areas of social sciences, including papers on sociology, psychology, politics, media, and economics. Many of the papers in this journal have been presented at the various conferences sponsored the [Social Sciences Division](#) of the **Athens Institute**. All papers are subject to **Athens Institute's** [Publication Ethical Policy and Statement](#).

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*The current issue is the second of the thirteenth volume of the **Athens Journal of Social Sciences (AJSS)**, published by the [Social Sciences Division](#) of Athens Institute.*

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Gregory T. Papanikos
President
Athens Institute



Athens Institute

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20th Annual International Conference on Psychology 25-28 May 2026, Athens, Greece

The [Psychology Unit](#) of Athens Institute organizes its 20th Annual International Conference on Psychology, 25-28 May 2026, Athens, Greece sponsored by the [Athens Journal of Social Sciences](#). The aim of the conference is to bring together scholars and students of psychology and other related disciplines. You may participate as stream leader, presenter of one paper, chair a session or observer. Please submit a proposal using the form available ([https:// www.atiner.gr/2026/FORM-PSY.doc](https://www.atiner.gr/2026/FORM-PSY.doc)).

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- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **27 April 2026**

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- Athens Sightseeing: Old and New-An Educational Urban Walk
- Social Dinner
- Mycenae Visit
- Exploration of the Aegean Islands
- Delphi Visit

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The [Sociology Unit](#) of Athens Institute is organizing its 20th Annual International Conference on Sociology, 4-8 May 2026, Athens, Greece sponsored by the [Athens Journal of Social Sciences](#). The aim of the conference is to bring together academics and researchers from all areas of Sociology, Social Work and other related fields. Theoretical and empirical research papers will be considered. You may participate as stream leader, presenter of one paper, chair a session or observer. Please submit a proposal using the form available (<https://www.atiner.gr/2026/FORM-SOC.doc>).

Important Dates

- Abstract Submission: **Closed**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **6 April 2026**

Academic Member Responsible for the Conference

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More information can be found here: <https://www.atiner.gr/social-program>

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Gender Identity and Sexual Orientation: Threatening Behaviors and Sexual Abuse among College Students

By Judy Porter & LaVerne McQuiller Williams[‡]*

This study explores the intersection of gender identity and sexual orientation in shaping the experiences of threatening behaviors and sexual abuse on university campuses. It highlights how cisgender women and LGBTQ+ individuals report significantly higher rates of verbal threats, sexual harassment, stalking, and sexual violence compared to their male or heterosexual peers. The findings emphasize the compounded vulnerabilities faced by LGBTQ+ individuals, especially LGBTQ+ women, who experience heightened risks of severe violence due to both gender-based and sexual orientation-based marginalization. These results support the importance of an intersectional approach in understanding victimization and advocate for tailored sexual violence prevention strategies in university settings. The study calls for comprehensive policies that address the unique needs of marginalized groups, with a focus on creating inclusive and supportive environments for all students.

Keywords: *college students, gender identity, sexual orientation, sexual violence, cisgender women, LGBTQ+ individuals, verbal threats, sexual harassment, sexual abuse, stalking, victimization, intersectional approach*

Introduction

The prevalence of threatening behaviors, including verbal threats, stalking, and sexual violence, has become a critical area of study in understanding the safety and well-being of college and university students. Within this body of research, scholars identify U.S. college students as being at risk for a variety of forms of victimization such as rape/sexual assault, physical assault, verbal threats, and stalking (Cantor et al., 2020; Daigle et al., 2024; Fedina, Backes, Sulley, Wood, & Busch-Armendariz, 2020; Fedina, Holmes, & Backes, 2018; Fisher, Cullen, & Turner, 2000, 2002; Krebs et al., 2016; Mengo & Black, 2016; Potter et al., 2020; Wood, Voth Schrag, & Busch-Armendariz, 2018). Gender identity and sexual orientation have been identified as key factors influencing the likelihood of experiencing such behaviors.

Gender Identity, Threatening Behaviors, and Sexual Abuse

The relationship between gender identity and the experience of threatening behaviors has been extensively studied, with consistent findings indicating that women, especially those in marginalized communities, are more likely to experience a range of harassment and violence. Research has shown that women, particularly cisgender women, are at a heightened risk for various threatening behaviors, including

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verbal threats, stalking, and sexual violence (Fisher et al. 2000, Turchik & Edwards 2012). Women's increased vulnerability to harassment is often attributed to societal norms that reinforce gendered power dynamics, leading to more frequent objectification and subjection to violent forms of control and dominance (Berkowitz 2007).

Research indicates that women are more likely than men to report being followed, spied on, or sexually harassed (Fisher et al., 2000, Coker et al. 2011, Wood et al. 2018). Additionally, female college students experience higher rates of verbal threats compared to their male counterparts. For instance, McGonigal and Scalora (2024) found that women are more frequently targeted by verbal harassment on college campuses. Similarly, Wood et al. (2018) reported that female students are at a significantly higher risk of experiencing verbal threats and harassment than male students.

In terms of stalking, a recent study by Fedina et al. (2020) found that 17.4% of college students reported experiencing stalking since entering college, with cisgender females and transgender/nonconforming students facing higher odds of victimization compared to their peers. Male students also experience stalking, though at lower rates than female students. The Centers for Disease Control and Prevention (CDC) (2020) estimates that 5.2% of men in the U.S. have experienced stalking in their lifetime. Among college students, studies have shown that male students report stalking rates between 5% and 19%, depending on the definitions and methodologies used.

Sexual assault on college campuses remains a critical issue, affecting men and women in distinct ways. Female college students report higher rates of sexual touching and attempted sexual penetration (Turchik & Edwards 2012). In addition, research consistently shows that women are more likely to experience sexual assault than men during their college years. Recent studies indicate that approximately 20% of women and 7% of men experience sexual assault during their college years, with women often facing more severe forms of assault and enduring long-term psychological impacts such as PTSD, depression, and anxiety (Cantor et al. 2020, Krebs et al. 2021, Steele et al. 2023). Men, on the other hand, are less likely to report their experiences due to societal stigma and gender norms, which can lead to unique challenges such as questioning their masculinity and dealing with homophobia if the perpetrator is male (Smith et al. 2018).

Sexual Orientation, Threatening Behaviors, and Sexual Abuse

Sexual orientation is another critical factor influencing the experience of threatening behaviors. LGBTQ+ individuals face unique challenges, with a growing body of literature documenting their heightened risk for harassment, discrimination, and violence. LGBTQ+ individuals often face threats to their safety not only due to their sexual orientation but also as a result of heteronormative environments that marginalize and stigmatize non-heterosexual identities (Balsam et al. 2005).

Studies have shown that individuals who identify as LGBTQ+ are at a significantly greater risk for various forms of harassment, including being followed, sexually harassed, and victimized by intimate partner violence (Elipe et al. 2022, Herek 2009, Rosario et al. 2009). Along these lines, the prevalence of stalking among LGBTQ+ students is notably higher compared to their heterosexual peers. According to the

Stalking Prevention, Awareness, and Resource Center (SPARC), 1 in 4 lesbian, gay, bisexual, asexual, or queer students reported experiencing stalking since entering college, compared to 1 in 6 heterosexual students. Similarly, a study by Fedina et al. (2020) found that 17.4% of college students reported stalking victimization since entering college, with cisgender females, transgender/gender-nonconforming, and sexual minority students facing higher odds of victimization compared to their counterparts.

Sexual assault among LGBTQ+ college students is a critical issue that has garnered increasing attention in recent years. Research indicates that LGBTQ+ students face significantly higher rates of sexual assault compared to their heterosexual peers (Cantor et al. 2020, Fedina et al. 2018, Klein et al. 2023, Richardson et al. 2015, Steele 2023, Woodford et al. 2018). A study by Eisenberg et al. (2017) found that bisexual and queer/pansexual/other females experienced sexual assault at rates 2.5 to over 5 times higher than heterosexual females. Similarly, Ford and Soto-Marquez (2016) reported that bisexual female students had the highest rates of sexual assault among all groups examined, with approximately 38% experiencing sexual assault during their college years. More recently research by Fedina et al. (2020) found that LGBTQ+ students are significantly more likely to report incidents of sexual assault.

The reporting of sexual assault among LGBTQ+ students is notably low, which complicates efforts to address and mitigate this issue. Despite the higher prevalence of sexual assault, LGBTQ+ students are often reluctant to report these incidents to authorities. Eisenberg et al. (2017) noted that the majority of sexual assaults among LGBTQ+ students go unreported, similar to trends observed in the general student population. This underreporting can be attributed to various factors, including fear of discrimination, lack of trust in institutional support systems, and concerns about confidentiality. The reluctance to report not only hampers the provision of necessary support and resources to survivors but also limits the ability to gather accurate data on the prevalence of sexual assault within this population.

Intersectionality of Gender and Sexual Orientation

An intersectional approach is essential to understanding the unique experiences of threatening behaviors among individuals with varying gender identities and sexual orientations. Intersectionality, as a theoretical framework, acknowledges that the experiences of oppression and privilege are not experienced in isolation but are shaped by the simultaneous interaction of multiple social identities (Crenshaw 1991). For instance, cisgender women and LGBTQ+ individuals face distinct but overlapping risks related to gender-based violence and sexual orientation-based discrimination.

Research on intersectionality has also highlighted the compounded nature of discrimination faced by LGBTQ+ women, as they navigate both gendered and sexual orientation-based forms of violence (Chung & Koo 2006). In fact, LGBTQ+ individuals, particularly women, may experience greater victimization due to both their gender and sexual orientation, amplifying their risk for sexual violence and harassment (Balsam et al. 2005).

Current Study

Building on the comprehensive understanding of gender identity, sexual orientation, and their intersection with threatening behaviors, the current study aims to further investigate the nuanced ways in which these factors influence the experiences of harassment, stalking, and sexual violence among college students. By focusing on the intersectionality of gender and sexual orientation, this research intends to highlight the compounded vulnerabilities of individuals, who face distinct but overlapping risks. Specifically, the study will explore how these intersecting identities amplify the likelihood of experiencing violence and victimization within university settings.

Methods

Data Collection

This study surveyed 3019 college students who attended a Northwestern University situated in Upstate New York in the U.S. This is an exploratory study concerning threatening behaviors toward them. The university is a STEM-focused institution located in Upstate New York, with a student population of approximately 20,000. The student body is approximately 54% white and 46% racial or ethnic minority, with 65% male and 35% female. After receiving approval from the Institutional Review Board, surveys were distributed at random to students in classes from all disciplines.

Measures

Gender identification and sexual orientation were explored in relation to threatening behaviors that included the following eleven variables: “verbal threats of sex against your will”, “person followed or spied on you”, “person sent unsolicited letters or written messages including email and IM”, “person stood outside your work or school”, “person showed up at places you thought that they had no business being”, “left unwanted items for you to find”, “person tried to communicate in other ways against your will”, “vandalized property or destroyed something you loved”, “sexual touching against your will”, “attempted sexual penetration against your will”, and “sexual penetration against your will”.

Gender identity was measured with self-described male, female, or other. Sexual orientation was measured by Gay/Lesbian, Bi-Sexual, or other. The threatening behaviors variables measured as never, once or twice, 3 to 10 times, more than 10 times. These variables were dichotomized into never or some due to small numbers in most of the categories. Binary logistic regression analyses were used to examine the effect of gender identity and sexual orientation on experiences of threatening behaviors. SPSS 29 was used for these analyses.

Characteristics of the Sample

Table 1 illustrates the characteristics of the survey respondents by self-designated gender identification and sexual orientation. Of the 3019 respondents 1707 identified as male and 1312 female. Respondents were majority heterosexual (n=2586) with a total of 163 identified as LGBTQ+ (64 male, 99 female) making up about 5.4% of the respondents to the survey. Of the LGBTQ+ group 23 men identified as Gay and 34 as bisexual and 7 other; 48 women identified as Lesbian and 49 bisexual, 2 other.

Table 1. *Characteristics of Respondents by Gender Identification and Sexual Orientation*
N = 3019

	CIS	Heterosexual	LGBTQ+	Gay	Lesbian	Bisexual	Other
men	1707		64	23		34	7
women	1312		99		99	49	2
total	3019	2586	163	23	99	83	9

Results

Table 2 provides a cross tabulation of the threatening behaviors by gender identity and sexual orientation. Cross tabulation found that gender achieved statistical significance with a chi square of <.001 for gender and a range of <.001 and .041 for sexual orientation for the following: Women (n=51, 3.8%) and LGBTQ+ respondents (n=18, 11%) reported more verbal threats. Women (n=293, 22%) and LGBTQ+ (56, 34%) being followed or spied on. Women (479, 36.5%) and LGBTQ+ (41, 25%) reporting unsolicited letters or written messages. Women (377, 30%) and LGBTQ+ (p=.012, 39, 24%) reporting someone standing outside their work or school. Women (330, 25%) and LGBTQ+ (46, 28%) reported more unwanted items left for them to find. Women (369, 28%) and LGBTQ+ (48, 29.5%) more likely to report unwanted communication. Women (337, 25.7%) and LGBTQ+ (44, 28.5%) more likely to report someone vandalized their property or destroyed something they loved. Women (121, 10%) and LGBTQ+ (33, 20%) were more likely to report someone sexually touching them against their will. A greater percentage of women (51, 3.8%) said they had been a victim of attempted sexual penetration against their will. There was no statistically significant association between LGBTQ+ and heterosexual respondents for attempted sexual penetration against their will. A greater percentage of women (36, 2.75%) and LGBTQ+ (11, 6/75%) reported sexual penetration against their will. Showing up at places someone should not be, was statistically significantly associated with Women (379, 29%) and heterosexual respondents (p=.041, 727, 42.5%).

Table 2. Crosstabulation: Threatening Behaviors and Gender Identification and Sexual Orientation N=3019

	CIS Male	CIS Female		LGBTQ+	Hetero- sexual	
Variable	n percentage	n percentage	Chi Square	n percentage	n percentage	Chi Square
Verbal Threats of Sex Against Your Will	16 .09%	51 3.8%	<.001***	18 11%	49 1.7%	<.001***
Followed or Spied on You	238 14%	293 22%	<.001***	56 34%	492 17%	<.001***
Sent unsolicited letters or written messages including email and IM	480 28%	479 36.5%	<.001***	41 25%	829 29%	<.001***
Stood outside your work or school	335 19%	377 30%	<.012**	39 24%	653 23%	<.012**
Showed up at places you thought that they had no business being	390 23%	379 29%	<.041*	42 26%	727 42.5%	<.041*
Left unwanted items for you to find	345 20%	330 25%	<.001***	46 28%	629 22%	<.001***
Tried to communicate in other ways	403 23.5%	369 28%	<.001***	48 29.5%	724 25%	<.001***
Vandalized Property or destroyed something	336 19.7%	227 25.7%	<.001***	44 28.5%	628 22%	<.001***
Sexual touching against your will	57 3%	121 10%	<.001***	33 20%	155 5%	<.001***
Attempted sexual penetration against your will	7 .04%	51 3.8%	<.001***	5 3%	53 3%	.804
Sexual penetration against your will	6 .035%	36 2.75%	<.001***	11 6.75%	31 1.1%	<.001***

p=.041*, p=.012**, p=<.001***

Table 3. Binomial Regression: Threatening Behaviors and Gender Identification $N = 3019$

Binomial Regression Analysis								
	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Verbal Threats of Sex Against Your Will	.774	.338	5.229	1	.022*	2.168	1.117	4.210
Followed or Spied on You	.373	.106	12.332	1	<.001****	1.452	1.179	1.789
Sent unsolicited letters or written messages	.383	.086	20.073	1	<.001****	1.467	1.241	1.735
Stood outside your work or school	.581	.130	20.036	1	<.001****	1.787	1.386	2.305
Tried to communicate in other ways	-.453	.136	11.171	1	<.001****	.636	.487	.829
Vandalized Property or destroyed something you loved	.290	.126	5.259	1	.022*	1.336	1.043	1.711
Sexual touching against your will	.590	.189	9.764	1	.002***	1.804	1.246	2.611
Attempted sexual penetration against your will	1.351	.446	9.175	1	.002***	3.860	1.611	9.249
Sexual penetration against your will	1.190	.486	5.994	1	.014**	3.288	1.268	8.526
Constant	-.620	.053	137.337	1	<.001	.538		

$p=.022^*$, $p=.014^{**}$, $p=.002^{***}$, $p<.001^{****}$

To summarize Table 3, all the threatening behaviors save one indicated that women were much more likely to report all the events more than men. While all the threatening behaviors are very concerning the two most serious “attempted sexual penetration” and “sexual penetration against their will” were reported at higher percentages at nearly three times as often, and over twice as often.

The sole variable that was significantly statistically associated with “having a person trying to communicate in ways other than letters or written messages including email and IM” - indicated that men were less likely to report this event by over 36 percent.

A binomial regression analysis of threatening behaviors and gender identification found that nine of the variables were statistically significantly associated with gender identity with eight of the variables associated with cisgender and one variable associated with cisgender men – “having a person trying to communicate in ways other than letters or written messages including email and IM” ($p<.001$, $Exp(B) = .636$), for every one unit increase in “someone trying to communicate in other ways”, saw a decrease of 36.4% (.487, .829) in men reporting this behavior.

Cisgender women were more likely to report verbal threats of sex against their will ($p=.022$, $Exp(B) 2.168$), for every one unit increase in reports of “receiving verbal threats of sex against your will” there was an odds of 116% (1.117, 4.210) chance of

reporting this behavior; having “someone following or spying on them” ($p < .001$, $\text{Exp}(B)$ 1.542) indicates that for every one unit increase in reporting this behavior, the odds of reporting this is increased by 45% (1.179, 1.789), the odds of “someone sending unsolicited letters or written messages” ($p < .001$; $\text{Exp}(B)$ 1.467) increased by 46% (1.241, 1.735), the odds of reporting a “person standing outside work or school” ($p < .001$, $\text{Exp}(B)$ 1.787) increased by 78% for each unit increase (1.386, 2.305), the odds of a “person vandalizing property or destroying something you loved” ($p = .022$, $\text{Exp}(b)$ 1.336) increased by 33% (1.043, 1.711) for every one unit increase in that behavior, The odds of having reported “sexual touching against your will” ($p = .002$, $\text{Exp}(B)$ 1.804) increased by 80% (1.246, 2.611) for each unit increase, the odds of having “reported attempted sexual penetration against your will” ($p = .002$, $\text{Exp}(B)$ 3.860) increased by 286% (1.611, 9.249), and the odds of reporting “sexual penetration against your will” ($p = .014$, $\text{Exp}(B)$ 3.288) increased by 229% (1.268, 8.526) for each unit increase.

Table 4. Binomial Regression: Threatening Behaviors and Sexual Orientation $N = 3019$

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Followed or Spied on You	.949	.187	25.746	1	<.001****	2.584	1.791	3.728
tried to communicate in other ways	-.650	.241	7.250	1	.007*	.522	.325	.838
Vandalized Property or destroyed something you loved	.657	.226	8.425	1	.004**	1.928	1.238	3.004
Sexual touching against your will	1.604	.238	45.350	1	<.001****	4.974	3.118	7.934
Attempted sexual penetration against your will	-2.035	.655	9.635	1	.002***	.131	.036	.472
Sexual penetration against your will	2.073	.488	18.076	1	<.001****	7.947	3.056	20.663
Constant	-3.360	.120	788.495	1	<.001****	.035		

$p = .007^*$, $p = .004^{**}$, $p = .002^{***}$, $p < .001^{****}$

To summarize Table 4, LGBTQ+ respondents were more likely to report being followed or spied on (over 1 and half times), vandalized property or something they loved destroyed (92%), being sexually touched against their will (nearly 4 times as much), and reporting “sexual penetration against their will (nearly 7 times as much).

A binomial regression analysis of threatening behaviors and sexual orientation found that four variables were statistically significantly associated with GLBTQ+ orientation, while two variables were statistically significantly associated with heterosexual orientation.

Having someone who “tried to communicate in other ways” ($p=.007$, Exp(B) .522) and “attempted sexual penetration against your will” ($p=.002$, Exp(B) .131) was statistically significantly associated with heterosexual orientation. It was found that holding all other predictor variables constant, the odds of someone who “tried to communicate in other ways” decreased by 52% (.325, .838) for a one unit increase in reports of someone who “tried to communicate in other ways”. While the odds of “attempted sexual penetration against your will” decreased by 13% (.036, .472) for a one unit increase in reported an “attempted sexual penetration against your will”. Respondents who identified as heterosexual were less likely to report someone who “tried to communicate in other ways” and “attempted sexual penetration against your will”.

Respondents who identified as LGBTQ+ were more likely to report being “followed or spied on” with the odds increasing by 158% for every one unit increase in reports of being “followed or spied on” ($p<.001$, Exp(B) 2.584 (1.791, 3.738)). The odds of LGBTQ+ respondents reporting having their property vandalized or something they loved destroyed increased by 92% ($p=.004$, Exp(B) 1.928, 1.238, 3.004). The odds increased by 397% of having been sexually touched against their will ($p<.001$, Exp(B) 4.974, 3.118, 7.934). The odds of LGBTQ+ respondents reporting “sexual penetration against your will” increased by 695% ($p<.001$, Exp(B) 7.947, 3.056, 20,663).

Discussion

The findings of this study underscore the significant role that gender identity and sexual orientation play in individuals' experiences of threatening behaviors and sexual abuse on university campuses. Cisgender women and LGBTQ+ individuals reported higher rates of verbal threats, sexual harassment, stalking, and sexual violence compared to their male or heterosexual counterparts. This study contributes to the growing body of research highlighting how both gender and sexual orientation intersect to influence the prevalence and severity of harassment and violence, further reinforcing the need for a nuanced understanding of campus safety and victimization.

Cisgender women in this study were notably more likely than their male peers to report experiencing verbal threats, sexual touching, and sexual penetration. These findings are consistent with previous research indicating that women, particularly those in higher-risk environments like college campuses, are more vulnerable to various forms of gender-based violence (Fisher et al. 2000, Turchik & Edwards 2012).

Moreover, the finding that women in this study were more likely to report experiences of being followed or spied on aligns with previous research on the prevalence of stalking and unwanted surveillance targeted at women (Fedina et al. 2020, Fisher et al. 2000, Coker et al. 2011). The relatively high rates of verbal threats, unsolicited messages, and harassment reported by cisgender women are also consistent with the works of Turchik and Edwards (2012) and Wood et al. (2018), who found that women are particularly vulnerable to sexual harassment and intimate partner violence. These findings suggest that the intersection of gender and power

dynamics continues to create an environment where women are disproportionately exposed to harmful behaviors.

LGBTQ+ individuals in this study also reported experiencing higher rates of threatening behaviors compared to heterosexual respondents, further supporting the growing body of literature documenting the unique vulnerabilities faced by LGBTQ+ individuals. LGBTQ+ individuals are more likely to experience sexual harassment, stalking, and violence due to their sexual orientation, often exacerbated by a culture of heteronormativity that marginalizes non-heterosexual identities (Balsam et al. 2005). This study's findings are consistent with previous research showing that LGBTQ+ individuals, especially LGBTQ+ women, are at a greater risk of experiencing sexual violence and victimization due to both societal prejudice and personal vulnerability (Herek 2009, Rosario et al. 2009). The significantly higher likelihood of LGBTQ+ individuals reporting sexual violence—such as unwanted sexual touching and sexual penetration—underscores the heightened risks they face in university environments, where stigmatization and exclusion are still pervasive.

The intersectionality of gender and sexual orientation was a key theme in this study. The compounded vulnerabilities faced by LGBTQ+ individuals, particularly those who are also women, were clear in the findings. LGBTQ+ respondents, especially LGBTQ+ women, were more likely to report severe forms of violence, including sexual penetration, than their cisgender heterosexual counterparts. This supports the framework of intersectionality proposed by Crenshaw (1991), which argues that the interconnected nature of identities—such as gender and sexual orientation—shapes the experiences of marginalization and victimization in unique ways. The intersection of these identities appears to amplify the vulnerability of individuals to violence and harassment. Balsam et al. (2005) similarly highlight that LGBTQ+ people of color face heightened victimization not only because of their sexual orientation but also due to the social prejudices linked to their racial and ethnic identities.

Additionally, the higher rates of sexual violence reported by LGBTQ+ respondents in this study reinforce findings from Cantor et al. (2020), Fedina et al. (2020), and Herek (2009), who noted that LGBTQ+ individuals, especially those in marginalized communities, face distinct risks for victimization. The compounded nature of their vulnerability, arising from both their gender and sexual orientation, often results in greater exposure to intimate partner violence, harassment, and sexual assault. These findings underscore the importance of adopting an intersectional approach when considering the experiences of LGBTQ+ individuals, particularly in environments such as universities, where students are exposed to a range of social and institutional pressures that can increase their susceptibility to violence.

Moreover, the findings of this study suggest that university settings may perpetuate a climate in which both women and LGBTQ+ individuals are at risk. The higher rates of verbal threats, stalking, and sexual violence reported by both groups emphasize the need for university administrators and policymakers to prioritize sexual violence prevention programs tailored to the needs of marginalized groups. This is especially important considering that both cisgender women and LGBTQ+ individuals face disproportionate rates of victimization, as evidenced by the study's statistical analyses. Turchik and Edwards (2012) argue that comprehensive and

intersectional prevention strategies are essential for addressing sexual violence on college campuses, and this study's findings support that argument.

In addition to gender and sexual orientation, future research should consider other intersecting identities, such as race, ethnicity, socioeconomic status, and disability, which may further influence the experiences of victimization among marginalized groups. For example, research by Chung and Koo (2006) indicates that LGBTQ+ women of color face unique challenges in navigating both gender and racial/ethnic-based violence. Understanding how multiple identities shape the experiences of stalking, harassment, and violence can provide a more nuanced understanding of campus safety and inform the development of more effective prevention and intervention strategies.

Finally, the study's findings have important implications for university policies and practices related to prevention of sexual violence. Cisgender women and LGBTQ+ individuals are at heightened risk for a variety of threatening behaviors, including verbal threats, sexual harassment, and sexual violence. Universities must create inclusive environments that address the specific needs of these groups and foster a culture of respect and safety for all students, regardless of their gender or sexual orientation. This includes implementing tailored sexual violence prevention programs, supporting bystander intervention training, and providing safe spaces for students to report incidents of harassment and violence.

Conclusion

This study underscores the complex and multifaceted nature of victimization based on gender identity and sexual orientation. Both cisgender women and LGBTQ+ individuals are more likely to experience verbal threats, stalking, sexual harassment, and sexual violence compared to their male or heterosexual counterparts. The findings highlight the importance of adopting an intersectional approach to understanding campus victimization, as the experiences of harassment and violence are shaped by the interaction of gender and sexual orientation. Addressing these vulnerabilities through targeted, intersectional prevention programs is essential for creating safer, more inclusive university environments.

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Socio-Economic Assessment of Biotech R&D Investment in Canadian Rapeseed/Canola

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Research investment has been a major driver of economic growth. Economic impact analysis of R&D investment should account for all direct and indirect related benefits and costs. This study examines the direct financial and indirect economic impacts of environmental and human health improvements from R&D investment in the Canadian biotech canola sector. It was found that investment in biotech canola R&D has yielded high rates of financial return and significant indirect environmental and human health benefits. The implications of these results for research policy are discussed, and several policy recommendations are made that could contribute to the biotech rapeseed/canola sector's growth, improvement in individual wellbeing, and increased overall social welfare. The paper sheds light on the important but neglected issue of accounting for environmental and health-related externalities when assessing R&D investment.

Keywords: *R&D Investment, Returns to Research, Environmental and Health Externalities, Biotechnology, Canola*

Introduction

Investment in agricultural research has been shown to be a key determinant of economic growth (Solow, 1957; Romer, 1990) with a high rate of returns (Griliches, 1988). During the 20th century, most agricultural crop production research was undertaken by public institutions, and the products of that research were held in the public domain (Huffman and Evenson, 1993). The introduction of modern biotechnology and improved Intellectual Property Rights (IPRs) has conferred monopolistic rights to the inventor, leading to increased private investment in agricultural research, which in turn has resulted in a concentrated privatized industry (Brewin and Malla, 2012; Malla and Brewin, 2019). These changes are particularly apparent in the Canadian rapeseed/canola sector, which has been transformed from a minor to a major crop over the last four decades with significant growth in area planted to rapeseed/canola cultivars, the number of cultivars available, and yields that have been on an upward trend for 50 years.

The agricultural industry around the world faces some major challenges regarding food security, sustainably balancing future supply and demand at a time of constrained research budgets, increasing pressures from population growth, changing consumption patterns and dietary preferences, post-harvest losses, climate change, loss in ecosystem biodiversity, and demands for the use of biomass to provide renewable energy (EASAC, 2013; United Nations, 2017; FAO, 2022). While global population is expected to grow significantly in the next few decades, it has been shown that

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agricultural productivity growth has slowed, especially in the world's richest countries (U.S. Bureau of Labor Statistics, 2021; USDA, 2021; OECD, 2023). Alston and Pardey (2010a; 2010b) attribute the slowdown in global productivity to underinvestment in certain types of productivity enhancing agricultural R&D. There is compelling evidence that investment in agricultural research, biotech rapeseed/canola in particular, also contributes to sustainable development and reduces environmental footprints, with benefits to breeders, farmers, consumers, and the overall economy.

Additionally, there is an important link between agricultural research and human health (Gray and Malla, 2001; Malla, Hobbs, and Perger, 2007; Hobbs, et al., 2014; Hobbs, et al., 2021). The incidence and severity of many major diseases (e.g., diabetes, coronary heart disease, cancer) are affected by diet. Research into improved food products and nutrition has the potential to improve health and reduce costs associated with disease. While first generation biotech crops focused on improving agronomic traits to benefit farmers, second-generation agricultural biotechnology research has focused more on improving the 'functional' attributes or nutritional quality of crops that help to address public health issues related to nutritional deficiencies and rising health care costs (Glass and Fanzo, 2017; Malla and Brewin, 2019; Matovu, 2021). In 2022, total health expenditure in Canada reached \$331 billion, or \$8,563 per person, which represented 12.2 % of Canada's gross domestic product (GDP) (CIHI, 2024). The economic benefits associated with 'quality improving' technical changes and/or health-related benefits (healthcare externalities) are very important, as they could increase social well-being.

The use of new genetically modified (GM) cultivars of rapeseed/canola in Canada have provided positive indirect benefits (externalities) associated with rapeseed/canola production as well as consumption. Positive production externalities, primarily resulting in environmental benefits, occur from a reduction in herbicide applications associated with reduced fuel consumption from fewer hectares being sprayed, as well as lower greenhouse gas emissions (Barfoot and Brookes, 2014; Brookes and Barfoot, 2020; Brookes, 2022; Bacon et al., 2023). Associated with the reduction in herbicide application has been an increase in carbon sequestration in the soil, resulting from less soil disruption (Sutherland et al. 2021; Brookes, 2022), as well as reduced soil and water contamination, which positively benefits the environment (Barfoot and Brookes, 2014; Bacon et al., 2023). Additionally, with the adoption of GM rapeseed/canola cultivars, there has been a shift in management practices through the adoption of zero tillage practices that have improved the carbon sequestration in the soil (Sutherland et al., 2021; Brookes, 2022).

Positive consumption externalities have been identified in healthcare savings from consumption of GM rapeseed/canola food products with improved oil profiles that contain no trans-fat or low saturated fatty acids (Malla and Brewin, 2015; Amiri et al., 2020). Increased levels of monounsaturated and polyunsaturated fatty acids have associated health benefits from reduction in cholesterol and reduced risk of cardiovascular diseases (Schwingshackl and Hoffmann, 2012; Jain et al., 2015; Malla and Brewin, 2015; Amiri et al., 2020; MacIntosh et al., 2021; Saini et al., 2021; Government of Canada, 2021; Qin et al., 2023).

The overall goal of this study is to gain a better understanding of the economic, environmental, and human health impacts of agricultural research in the Canadian

rapeseed/canola sector. The appropriate government's role in canola research is also discussed.

Assessing Direct and Indirect Benefits of Biotech R&D Investment – Rapeseed/Canola in Canada

General Methods of Assessing Returns to Investments in Agricultural Research

Measuring returns to investments in agricultural research is important but very difficult. The net economic benefits of an investment typically are measured in one of three ways: the net present value (NPV), the benefit-cost ratio (B/C), and the internal rate of return (IRR).¹

The NPV, which measures the absolute net present value of the gain of the project, is defined as: $NPV = \sum_{t=1}^{\infty} \frac{B_t - C_t}{(1+r)^t}$ where: B_t is the sum of benefits that result from the project in year t ; C_t is the sum of the costs associated with the project in year t ; and, r is the rate of discount.

The benefit cost ratio (B/C ratio) can compare the benefits of investment on a per-dollar cost basis.

The B/C ratio is defined as: $B/C = \sum_{t=1}^{\infty} \frac{B_t}{(1+r)^t} / \sum_{t=1}^{\infty} \frac{C_t}{(1+r)^t}$. If B/C is greater than 1.0, then for every \$1 cost of the project, the gain is more than \$1 so the project may be undertaken. If there are a lot of projects and a limited source of funding, the ones with the higher B-C ratio should be given preference. Hence, the B-C ratio can be used to rank the agriculture research projects or programs.

The IRR is the estimated discount rate that results in a NPV equal to zero. IRR is defined as: $0 = \sum_{t=1}^{\infty} \frac{B_t - C_t}{(1+IRR)^t}$. If IRR is greater than the selected discount rate or the opportunity cost of funds/capital, then the agricultural research project or program is profitable.

¹For more information see: Government of Canada (2023). Canada's Cost-Benefit Analysis Guide for Regulatory Proposals. <https://www.canada.ca/en/government/system/laws/developing-improving-federal-regulations/requirements-developing-managing-reviewing-regulations/guidelines-tools/cost-benefit-analysis-guide-regulatory-proposals.html>; OECD (Organization for Economic Co-operation and Development) (2018). Cost-Benefit Analysis and the Environment. Further Developments and Policy. Use. <https://www.oecd.org/publications/cost-benefit-analysis-and-the-environment-9789264085169-en.htm>; OECD (Organization for Economic Co-operation and Development) (2006). Cost-Benefit Analysis and the Environment. Recent Developments. https://www.oecd-ilibrary.org/environment/cost-benefit-analysis-and-the-environment_9789264010055-en; CRRDC (Council of Rural Research and Development Corporations) (2014). Impact Assessment Guidelines, <https://www.ruralrdc.com.au/wp-content/uploads/2018/08/CRRDC-Impact-Assessment-Guidelines-V.1-070514.pdf>; Alston, J.M., Norton, G.W., and Pardey, P.G. (1997). *Science Under Scarcity: Principles and Practice for Agricultural Research Evaluation and Priority Setting*. Ithaca and London: Cornell University Press.

Direct Economic Benefits - Returns to Research on Improving Productivity of Rapeseed/Canola

Nagy and Furtan (1978) studied investment in rapeseed breeding research in Canada to estimate the rate of return and the net benefits to consumers and producers. The study measured the internal rate of return (IRR) and the net benefits for producers and consumers for the period 1960-1974 due to improvement in the yield of rapeseed/canola cultivars. They found that producers had a net benefit of 47% and consumers had a net benefit of 53%. Additionally, they estimated an IRR value of 101%, indicating a severe underinvestment in yield increasing research. In an updated study that included several additional years of data, Ulrich, et al. (1984) calculated the IRR from improved yield research in Canadian rapeseed/canola production to be 51% (68% producers' share, 32% consumers' share) for the period of 1951 to 1982.

Fulton and Keyowski (1999) assessed the producer benefits of adopting the new herbicide-resistant (HR) canola cultivars, such as Roundup Ready, Smart Open Pollinated, Liberty Hybrids, and Conventional Open Pollinated rapeseed/canola cultivars. They estimated that the gross returns (\$/acre) of Roundup Ready canola were \$225.30 on average, Smart Open Pollinated were \$213.75, Liberty Hybrids were \$238.10, and open-pollinated were \$242.13 in 1999. They concluded that the agronomic, management and technological factors facing farmers were very important determinants of producers' benefits and while some producers benefited greatly from new HR technology, others did not.

Malla et al. (2004) evaluated the net economic benefits received from investing in research and development in the Canadian rapeseed/canola sector from 1960 to 1999. Their study additionally examined changes within the rapeseed/canola sector with the introduction of intellectual property rights (IPRs) and biotechnology that created incentives for private firm investment. From 1960 to 1999 the Canadian rapeseed/canola sector underwent many changes including the shift from public to private research as new technologies, IPRs, government support and subsidies created incentives for private firms to invest in rapeseed/canola research. Using data from a variety of different sources they estimated "the average IRR initially exceeded 25% per year and steadily declined during 1970-1999, ultimately approaching the level of market returns. The IRR for the marginal dollars invested each year shows a much more dramatic decline and during the 1990s, was well below the market rates of return" (Malla et al. 2004). Additionally, they found that the NPV declined with increases in investment in research and their models showed "greater research expenditures increased net present value from \$61 million in 1973 when the PV costs were \$15.8 million to a peak of \$131 million in 1993 when the PV of costs were \$74.1 million. Subsequently, the NPV declined as the increase in expenditure exceeded the growth in benefits. By 1999, the net present value of yield increases had declined to \$94 million when the PV of costs was \$116 million" (Malla et al. 2004). The authors suggested that "The results of this study challenge current government policy in canola research. The canola research industry is subsidized and property rights for canola seed are well established. Given that property rights allow private firms to capture the full social benefit of investment, this will attract capital and drive the rate of return toward normal levels. If government subsidizes the costs of private research, it is certainly

possible to create overinvestment in an industry.” (Malla et al. 2004). Their study concluded that “If the canola research sector is to receive future public support, these expenditures should be directed toward areas of research where IPRs are poorly defined...the decreasing IRR suggests that the role of government in applied research should be focused on those sectors and technologies where IPRs do not exist” (Malla et al. 2004).

Malla and Brewin (2012) assessed the effects that advancements in biotechnology had on the Canadian rapeseed/canola sector, the adoption of biotechnology in the rapeseed/canola sector and the economic impacts from adoption of biotechnology at the firm level. Their study evaluated the Canadian rapeseed/canola sector from 1969 to 2012 with data compiled from a variety of sources to assess the area seeded, yield and different varieties of rapeseed/canola. Several different canola product lines were considered such as Roundup Ready, Liberty Link, Clearfield, and Open Pollinated. They compared the costs and benefits of the adoption of different canola cultivars to generate estimates of producers' benefits and the net return to breeders. The net returns to breeders were based on the difference between seed revenue and costs of research and seed production, while the farmers' net returns were calculated as the difference between the farmers' system cost and their gross returns. The study found that the rapeseed/canola sector had been positively impacted by biotechnology when considering the area seeded to rapeseed/canola, the number of cultivars available; additionally, rapeseed/canola yields had been on an upward trend for 50 years. It was estimated that the farmer gains (over open pollinated varieties) of Roundup Ready canola were \$488 million (\$858/ha), Liberty Link were \$533 million (\$867/ha), Clearfield were \$14 million (765/ha) (open pollinated: \$725/ha) in 2011. Further, it was estimated that “At currently high seeded areas and high prices, producer benefits were estimated to be more than \$1 billion and breeding firm returns were more than \$700 million” (Malla and Brewin, 2012). Compared to Fulton and Keyowski (1999) and Malla et al. (2004) it was concluded that “However, when we update Fulton and Keyowski’s estimates of benefits to farmers under different production systems using current 2011 values, farmers (and breeders) appear to gain significantly by using the new technologies versus open-pollinated canola...Some research suggests the returns to research have begun to drop off toward market rates (Malla, et al. 2004). Current budgets ... suggest significant gains to producers and returns to breeders in the current seed market.” (Malla and Brewin, 2012). It was also stated that “Various authors have also argued that the economic benefits for producers by growing HT canola are significant (Gusta et al., 2011; Phillips, 2003; Serecon Management Consulting, Inc., 2001, 2005). These benefits come from the agronomic benefits of new HT varieties as well as the gain in productivity from improved breeding and hybridization (Veeman & Gray, 2010)”. (Malla and Brewin, 2012). Therefore, it was clear that the adoption of biotechnology into the rapeseed/canola sector had been very beneficial, especially to producers and plant breeders.

Biotechnology has played an important role in the Canadian rapeseed/canola sector and contributed to the creation of modified rapeseed/canola cultivars, such as herbicide tolerant (HT) canola. Malla and Brewin (2015) estimated the cumulative benefit of herbicide tolerant canola adoption to be \$30 billion from 1996 to 2012 and it was on an upward trend for most of that period. They calculated the net benefits for

the 2012 crop year to be \$726 million. Other trends mentioned in the study about the rapeseed/canola sector include significant benefits associated with new rapeseed/canola herbicide tolerant varieties that have increased yield, area seeded, and the number of cultivars available. They also examined the role of government and identified “public provision of basic research, targeted government subsidies (e.g., subsidies on the cost of R&D or research output), charging fees above marginal cost to access basic research, or granting exclusive licenses have merit as appropriate government policies that could improve social welfare. Government’s role could also be important in R&D regarding varieties with health traits or environmental benefits.” (Malla and Brewin, 2015).

Indirect Benefits – Environmental Improvements

A study conducted by the Canola Council of Canada assessed the “agronomic and economic impacts associated with transgenic canola to better understand the impact it has had on agriculture in western Canada” (Canola Council of Canada 2001). The direct and indirect impacts were assessed with the direct impacts defined as “the net impact on the economic returns due to the combined impacts on revenues and on operating costs from changes in key agronomic practices relating to pesticide use, fertilization, tillage, and other practices” (Canola Council of Canada, 2001). The indirect and induced impacts were defined as “the impacts on the rural communities, on the impact supply industries serving the industry, on canola prices, and on other crop production in western Canada” (Canola Council of Canada, 2001). Additionally, the indirect impacts included an environmental assessment of herbicides, fertilizers, and energy between conventional and transgenic canola production. The study surveyed 650 producers, with 325 growing conventional canola and 325 growing transgenic canola in the year 2000. It was concluded that the producer herbicide costs were lower in transgenic canola production (\$16.22 per acre) compared to conventional canola (\$21.72 per acre). Participants in the study stated that their primary reason for adopting transgenic canola were not economic, but agronomic. Among the agronomic benefits were early and effective weed control, decreased tillage use, improved soil moisture conservation, improved rotation flexibility, lower dockage, and decreased herbicide inputs.

The aggregate economic impact of the adoption of transgenic canola production was measured by the net gain in gross margin of transgenic cultivars over non-transgenic cultivars for the acreage harvested in each system. The number of transgenic acres increased from approximately 1.5 million acres in 1997 to 6.1 million acres in 2000. Expressing this annual impact in 2000 dollars resulted in \$28.8 million in 1997, up to \$72.9 and \$81.2 million in 1998 and 1999 respectively, and then down to \$66.0 million in 2000. The cumulative net impact of this adoption was estimated at \$249.0 million over the four-year period (Canola Council of Canada, 2001). The cumulative economic impact “the direct impacts based on the detailed model calculation is estimated at \$249.0 million in 2000 dollars. The farmers’ net income-based estimate of direct impact is \$144.0 million. The indirect impact in 2000 dollars is estimated to range between \$58.0 and \$215.0 million ... (and) the total economic impact of transgenic canola production systems has been estimated to be up to \$464.0 million

over the period 1997 to 2000, inclusive of direct and indirect impacts” (Canola Council of Canada, 2001).

Similarly, Phillips (2003) investigated the benefits and costs of herbicide tolerant (HT) canola on farmers, innovators, and markets, while also discussing “some of the unintended indirect impacts of the HT technology on producer, markets, and the environment” (Phillips, 2003). The study estimated that the net benefit producers gained in 2000 was \$70 million with producers capturing approximately 29% of the gross benefits of the new technology. He noted that producers who planted herbicide tolerant (HT) rapeseed/canola cultivars obtained a variety of direct and indirect benefits, including lower herbicide costs, less herbicide application, higher seed costs, earlier seeding, and lower dockage. In addition to a gross increase in the net operating return to innovators of “C\$140 million gross annual return to the innovators in 1999-2000” (Phillips, 2003) he acknowledged that HT rapeseed/ canola cultivars had a positive environmental impact with less toxic herbicides being used and a reduction in the amount of herbicide ingredients being applied.

Smyth et al. (2010) and Gusta et al. (2011) assessed the economic and ecological impacts of genetically modified herbicide tolerant (HT) rapeseed/canola in western Canada based on the results of an 80-question survey given to Canadian producers in Alberta, Saskatchewan, and Manitoba in 2007. The producer survey comprised six focus areas: weed control; volunteer canola control; canola production history; specific weed-control measures on canola fields and subsequent crops; crop and liability insurance; and general demographics. The survey also accounted for three major impacts: ‘spillover’ i.e., multi-year benefits due to fewer weeds or easier weed control on a field from one year to the next; ‘reduced tillage’ i.e., cost of weed control; and ‘cost of volunteer control’ when HT became an in-crop weed or volunteer. Results from their studies indicated that the average direct benefits associated with the new technology were \$150 million for the period 2005-2007. They estimated that the spillover benefits ranged from \$67 million to \$110 million, reduced tillage decreased costs by \$153 million, while an additional cost for controlling volunteer canola was \$15 million (2005-2007). Consequently, the average total indirect economic benefits of genetically modified HT rapeseed/canola were \$235-\$278 (2005-2007). The authors claimed that “The survey revealed that the new technology generated between \$1.063 billion CAD and \$1.192 billion annual net direct and indirect benefits for producers from 2005-2007; this is partly attributed to lower input costs and partly attributed to better weed control.’ (Gusta et al. 2011). The authors concluded that “This report refutes the claims and accusations made by critics of agricultural biotechnology that genetically modified crops do not benefit farmers and are harmful to the environment...the benefits are numerous and substantial.” (Smyth et al. 2010).

Smyth et al. (2011a) compared the environmental impact of the herbicides applied in 2006 to HR cultivars relative to the environmental impacts of the herbicides that were applied to rapeseed/canola in 1995 before the introduction of HR rapeseed/canola in Western Canada. They developed an Environmental Index (EI) to compare the relative toxicity of the herbicides on farm workers and found that “... substantial environmental benefits, associated with changes in herbicide use patterns, from the widespread adoption of HR canola... The cumulative EI effect from herbicides dropped by 53% between the two periods. When the subcomponent values of the EI

are compared, there is a reduction of over 40% in each of the subcomponents. The farmworker and ecology subcomponents decline by 56% and 54%, respectively, whereas the consumer subcomponent declines by 42%...The total volume of herbicide active ingredient applied to canola fields dropped by 1.3 million kg, representing a 38% reduction in quantity between the 2 years” (Smyth et al. 2011a). The overall canola production in 1995 and 2006 was very similar and the decline in the environmental index can be linked to the adoption of HR canola. The authors concluded that “The commercialization and widespread adoption of herbicide-resistant (HR) canola has changed weed management practices in Western Canada. Before the introduction of HR canola, weeds were controlled by herbicides and tillage as the leading herbicides at that time required tillage to allow for soil incorporation of the herbicide. Much of the tillage associated with HR canola production has been eliminated as 64% of producers are now using zero or minimum tillage as their preferred form of crop and soil management. Additionally, there have been significant changes regarding the use and application of herbicides for weed control in canola...The cumulative environmental impact was reduced almost 50% with the use of HR herbicides.” (Smyth et al., 2011a).

Similarly, Smyth et al. (2011b), assessed the environmental impacts from herbicide tolerant (HT) canola production in the three-prairie provinces of Alberta, Saskatchewan, and Manitoba. The study was “comprised of six major areas of focus: weed control; volunteer canola control; canola production history; specific weed control measures on canola fields and subsequent crops; crops and liability insurance; and general demographics” (Smyth et al., 2011b). They found that producers were applying one less herbicide application after the uptake of HT canola. This demonstrated significant environmental benefits with HT canola production with around 1.3 million kg reduction in herbicide/pesticide application and the adoption of zero-tillage practices that had greater carbon sequestration, increased moisture composition, and reduced soil disturbance. Summarizing their results, they wrote “A reduction in the total number of chemical applications over the 3-year period was reported, resulting in a decrease of herbicide active ingredient being applied to farmland in Western Canada of nearly 1.3 million kg annually. Fewer tillage passes over the survey period were reported, improving moisture conservation, decreasing soil erosion and contributing to carbon sequestration in annual cropland. An estimated 1 million tonnes of carbon are either sequestered or no longer released under land management facilitated by HT canola production, as compared to 1995. The value of this carbon off-set is estimated to be C\$5 million.” (Smyth et al. 2011b).

Malla and Brewin (2015) found that, in addition to the economic benefits from biotech research in the Canadian rapeseed/canola sector (detailed in the previous section), several positive externalities resulted in the form of reduced environmental impacts (e.g., better weed control, better volunteer canola management, reduced tillage).

Indirect Benefits - Human Health Improvements

A study by Gray and Malla (2001), investigated the economic impact of switching from rapeseed to canola cultivars that have lower yields but improved quality with health benefits such as a reduction in coronary heart disease. They focused on the development of canola cultivars that contain lower levels of erucic acid (shown to be a threat to human health) and glucosinolates in meal (shown to be a threat to animal nutrition). Additionally, the rapeseed/canola cultivars are associated with positive health benefits by containing a low level of saturated fat and a high level of monounsaturated fat. Gray and Malla (2001) indicated the significance of the type of fatty acid found in oil because “The strong linkage between blood cholesterol and coronary heart disease has led to much research on how consumption of different types of fats affects serum cholesterol levels. . . research showed that the consumption of saturated fatty acids increases blood cholesterol levels ..it was shown that consumption of monounsaturated fatty acids also lowered cholesterol and that these fatty acids were in fact preferable to polyunsaturated fatty acids because the monounsaturated fatty acids lowered LDL (harmful) cholesterol levels but not HDL (beneficial) cholesterol levels” (Gray and Malla, 2001). A decrease in cholesterol from monounsaturated fatty acids can lead to a reduction in coronary heart disease providing a positive health benefit for consumers and taxpayers. Additionally, the overall effect received from the consumption of these quality improved canola varieties is less heart disease in individuals and reduction in public health care costs.

It was estimated that the sector (producers, processors, consumers) had gained from quality-improving technical change (health/nutrition research) even though it came at the expense of potential yield, but producers were the largest beneficiaries of health information. According to Gray and Malla (2001), “in making the switch to canola some genetic yield potential was given up. . . [In] the post adoption period yields remain 9.1 percent below the trend established by rapeseed. . . . In the late 1980s, nutritional research created positive health information about canola that increased demand and raised the price of canola oil relative to soybean oil by an estimated \$32 per metric ton. . . . Given a \$1.67 per kilogram externality, such a demand shift would reduce health costs by an estimated \$25 million per year in Canada.” The study concluded that “Preliminary research suggests that canola has also provided substantial benefits to taxpayers through reduced incidence and cost of coronary heart disease. These external cost savings are as large as the market value of the crop. This suggests that the health care costs associated with nutrition may be an important but largely neglected aspect of the economics of agricultural and research policy.” (Gray and Malla, 2001)

Malla et al. (2007) explored the potential magnitude of the health benefits, and the social benefits associated with the development of a trans fat-free canola oil using the example of Natreon canola oil (Nexera, produced by Dow Agroscience, Inc). Recently, mounting scientific evidence has linked the consumption of trans fatty acids (TFA) and elevated cholesterol levels, and in turn, a higher incidence of coronary heart disease has garnered much public attention. Cardiovascular disease is the largest contributor to health-care costs and the leading cause of death in

Canada. It has been shown that the main source of TFA is hydrogenated vegetable oils. Responding to consumer interest in trans fat-free products, much research was devoted to new seed canola cultivars with high oleic content (monounsaturated fatty acid) that could produce stable oil without the hydrogenation process that creates trans-fats. The new canola cultivar called 'Nexera' was an example of such seeds that created 'Natreon', a branded oil grown from Nexera. This new canola oil was considered as a functional lipid food due to its modification of fatty acid composition. Functional food is defined as a food product that has physiological benefits and/or reduces the risk of a chronic disease beyond a basic nutrition function. It has higher levels of oleic acid (monounsaturated fatty acid) and lower levels of linolenic acid (polyunsaturated omega-3 fatty acid) than conventional canola oil while has the lowest saturated fat content of all vegetable oils, which in turn reduces the risk of cardiovascular diseases.

The authors estimated the potential savings in health care or illness costs if new nonhydrogenated vegetable oils replace the trans-fat-rich hydrogenated oils in the Canadian market ranging from \$1.818 billion to \$639 million the found that the health benefits from reduced daily TFA intake and the development of healthier foods, in this case trans fat-free vegetable oil, were nontrivial and potentially increases economic welfare. The study revealed very significant external/indirect or social benefits related to canola oil with health traits, in terms of reduction in healthcare costs or healthcare savings in Canada.

Table 1. Summary of Economic Returns to Canadian Rapeseed/Canola Research Studies

Study	Methods>Returns to Research
Direct Economic Benefits	
Nagy and Furtan (1978): Rapeseed/Canola	IRR: 101%; Producer Benefits (direct): 47%; Consumer Benefits: 53%
Ulrich, Furtan, and Downey (1984): Rapeseed/Canola	IRR: 51%; Producer Benefits (direct): 68%; Consumer Benefits: 32
Fulton and Keyowski (1999): HR canola	Producer Benefits (direct): \$213.75-\$242.13/acre (gross returns, \$/acre, in 1999)
Malla, Gray, and Phillips (2004): Rapeseed/Canola	IRR: Initially exceeded 25%; declined to market returns; (40% down to 7%); NPV: \$61 million (in 1973), \$131 million (in 1993), \$94 million (in 1999)
Malla and Brewin (2012): HT canola	Net returns to breeders: more than \$700 million (high price, in 2011); Aggregate Producer Benefits: more than \$1 billion (high price, in 2011)
Malla and Brewin (2015): HT canola	Producer Benefits: \$30 billion (cumulative 1996-2012), upward trend; \$726 million (2012)
Indirect Benefits /Environmental Improvements	
Canola Council of Canada (2001): transgenic canola	Producer Benefits (direct): \$66 million in 2000 (or \$10.62 per acre); \$249.0 million (cumulative, 1997-2000);
	Total Indirect Impact: \$58.0 - \$215.0 million (cumulative 1997-2000);

	Total Economic Impact: \$464.0 million (cumulative, 1997-2000)
Phillips (2003): HT canola	Producer Benefits (direct): \$70 million (in 2000); acknowledge environmental benefits from the reduction in herbicide application
Smyth, Gusta, Belcher, Phillips, and Castle (2010) and Gusta, Smyth, Belcher, Phillips, and Castle (2011): GMHT canola	Producer Benefits (direct): \$150 million (average 2005-2007); Producer Benefits (indirect & environmental benefits): \$235-\$278 million (average 2005-2007)
Smyth, Gusta, Belcher, Phillips, and Castle (2011a): HR canola	Producer Benefits (indirect & environmental Benefits): 64% of producers are now using zero or minimum tillage; 50% reduction in the use of HR herbicides
Smyth, Gusta, Belcher, Phillips, and Castle (2011b): HT canola	Environmental Benefits: nearly 1.3 million kg annually decrease in herbicide/chemical applications; 1 million metric tons of carbon is either sequestered or no longer released, Environmental benefits CAD\$5 million (value of the carbon off-set) annually
Indirect Benefits/Human Health Improvements	
Gray and Malla (2001): Rapeseed/Canola	Switch from rapeseed to canola & health information: \$32 per metric ton increase in demand; 9% permanent reduction in yield; \$1.67/kg externality, or \$25 million per year health costs savings in Canada; industry gained & producers benefited
Malla, Hobbs, and Perger (2007): Nexara Canola	Healthcare Savings: \$ 1,818 - \$ 639 million annually (from a reduction in daily TFA intake)

Source: Authors'

Conclusions and Policy Recommendations

Based on the results found by several economists, it can be inferred that research policy has been very successful in the Canadian canola crop with high economic rates of return on investment as well as significant positive externalities in the form of environmental and human health benefits. Specifically, as has been shown through a review of many comprehensive well-done studies, the Canadian rapeseed/canola sector has had high overall economic returns to investments in the research (Nagy and Furtan, 1978; Ulrich et al. 1984; Malla et al. 2004; Malla and Brewin, 2012), with direct benefits to producers (Nagy and Furtan, 1978; Ulrich et al. 1984; Fulton and Keyowski, 1999; Canola Council of Canada, 2001; Gray and Malla, 2001; Phillips, 2003; Smyth et al., 2010; Gusta et al., 2011; Smyth et al., 2011a; Malla and Brewin, 2012; Malla and Brewin, 2015). Additionally, there have been production-related environmental improvements (sometimes called positive externalities) through reductions in the amount of herbicides applied and greenhouse gas emissions, as well as increased carbon sequestration from advances in canola crop production as a result of agronomic and biotech research (Canola Council of Canada, 2001; Phillips, 2003; Smyth et al., 2010; Gusta et al., 2011; Smyth et al., 2011a; Smyth et al., 2011b). Similarly, there have been human health improvements from consuming oils from biotech-produced rapeseed/ canola (sometimes called positive consumption-related externalities) as a

result of reduced cholesterol, lowering the risk of cardiovascular disease from improvement in trans fat, saturated fat, monounsaturated fatty acids, and polyunsaturated fatty acids in the canola oil providing a healthcare cost saving (Gray and Malla, 2001; Malla, Hobbs, and Perger, 2007).

While most studies on returns to biotech research on rapeseed/canola have focused on the economic returns that resulted from greater demand and/or lower costs of production, more attention should be paid to an assessment of the Canadian rapeseed/canola sector's production and consumption externalities. Positive externalities that resulted from planting of GM cultivars with specific traits and consumption of the resultant products have been important and significant in terms of reduced environmental impacts, actions on climate change, healthcare cost savings, growing populations, and food security. Accounting for all external benefits and costs associated with any innovation is essential as it allow us to provide a more accurate estimation of the total benefits from research investment.

The review of the rate of return studies to investments in biotech rapeseed/ canola production and consumption in Canada also found compelling evidence that the economic return from investment in rapeseed/canola agricultural research has historically been very high and generally remained so. These high rates of return, which are consistent with many agricultural research studies for specific crops in Canada and internationally, suggest a persistent underinvestment in rapeseed/canola agricultural research by both the public and private sectors. Hence, the persistent high rates of return to rapeseed/canola research investment strongly suggest that additional research is desirable.

It has been shown that private firms invest less in R&D than the socially optimal amount even with fully appropriable IPRs (intellectual property rights) because they cannot fully appropriate all the research benefits or capture the full value generated from their investment (Malla and Gray, 2003; 2005). Economic theory suggests that the incentives for private investment in research are inadequate if some research spillover benefits go to others who do not pay for the research (e.g., improvements in environmental and human health benefits). Research firms are only concerned with their private benefits from an R&D investment and not the spillover effects that their action might have on others. This lack of private incentive creates underinvestment in research and correspondingly creates a high social rate of return for the limited dollars that are expended.

Overall, there is a role for public support of agricultural research even with the establishment of completely enforceable IPRs and biotechnologies. The public should invest in research into cultivars that will result in human health or environmental benefits and areas where IPRs are not well defined or where the private sector is not able to capture all the research benefits. In general, the public sector should invest in areas where industry does not have adequate incentives to invest (e.g., basic research, agronomic research, open-pollinated non-HT crops, cultivars with health or environmental benefits).

In summary, there is compelling evidence that investment in the Canadian biotech rapeseed/canola sector contributes to sustainable development and reduced environmental footprints, with benefits to breeders, farmers, consumers, and the overall economy. Economic impact assessment of rapeseed/canola R&D investment

should account for all direct and indirect related benefits and costs. Although the rapeseed/canola sector has a high level of private investment, there is an important role for public support of agricultural research, especially in cultivars that have health or environmental benefits where industry might not have adequate incentives to invest.

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Breadwinner Mothers as Educators: Navigating the Challenges of Making Both Ends Meet

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This phenomenological study described and examined the lived experiences of fifteen in (15) purposively selected breadwinners who were teaching basic education in the city and province of Cebu, Philippines. Naturalistic paradigm was used in the study with varied tools to crosscheck the information, responses and reflections gathered which were interpreted and deduced into different themes from their narrative accounts. Results revealed that breadwinner mothers worked hard for the family. They were dedicated mothers at home and committed teachers in school. They engaged themselves in selling cosmetics, hog raising and loans to financially support the family. The multifunction roles of the breadwinner mothers made them stronger in facing life's adversities. They realized that they could provide the family's needs while some of them, forgot their own needs as a woman. As teachers, they could easily avail loans even if they had very little left from their salary. With the credits and loans, they were able to send their children to school. Their quality of life was full of hardships, varied roles to play and economically challenged journey towards their goals in life. Yet they face the challenges with deep faith in God, satisfaction and contentment and strong determination for the family to succeed by sending them to school believing that education could help alleviate the family from the grips of poverty. Thus, breadwinner mothers had psychosocial and financial challenges and programs for financial literacy and support for well-being for teachers are recommended.

Keywords: *Women, Teachers, breadwinner, financial literacy, quality of life, phenomenology*

Introduction

Women moving out from home into paid labor force has changed the way the family lives for quality living and are financially fragile (OECD, 2023; Lusardi & Mitchell, 2023). The role of working mothers as breadwinners is one striking fact that they can no longer stay at home full time as mothers. According to Pew Research Center (2024) many women are economically responsible for themselves and their families shows how far women have come in terms of education, career advancement, and their own economic independence. This is an indication that this pattern will revert to those in 1960's. Women's roles have evolved significantly, and are able to make a good impact on society (Yadav & Kumar, 2021).

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Traditionally, fathers entered the workforce, while mothers dedicated their time and energy toward raising children and caring for elders. For married couples, only one parent joined the workforce while the other stayed at home to provide family care. However, patterns have changed over the past several decades. As the principal producer of revenue for the family, a parent who is raising their children alone naturally takes on the role of primary breadwinner, with salaries from employment being the most prevalent source of income (McErlean & Glass, 2024; Glass et al, 2021; Abishek & Gayathri, 2018).

Even in the most educated nations, financial literacy is still generally poor, despite the strong correlation between better education and increased financial awareness as noted by Lusardi & Mitchell (2023; 2008). Additionally, financial literacy cannot be adequately replaced by education because its effects extend beyond the confines of formal schooling. Globally, there are also noticeable disparities in financial literacy between genders and age groups. Women are more likely to be financially vulnerable than males since they continuously show lower levels of financial understanding than men (Lusardi & Mitchell, 2023, 2011; Gudjonsson et al, 2022). The recent COVID-19 pandemic showed how women were more likely than men to be financially vulnerable (OECD, 2023; IMF, 2020).

In the Philippines, based on the 2022 Standard & Poor's (S&P) Global Ratings (2022) indicated that just twenty-five percent (25%) of Filipino individuals were thought to be financially literate, placing the Philippines in the bottom 30 out of 144 countries. Likewise, the Philippine Enhancing Financial Literacy Program (2024) among Pantawid Pamilyang Pilipino Program beneficiaries, stated that families has low levels of financial literacy among middle-class households, but also for rural, low-income communities, where income may be variable or uncertain. Such situation is evident with marriage and increasing family obligations, such as household expenses, education and financial commitments. Based on the Bangko Sentral ng Pilipinas Report (2024), most Filipinos have good knowledge on financial concept of investments, but lack understanding in the concept of healthy budget and inflation. More importantly, the study showed that only forty-nine percent (49%) of Filipinos put money in bank accounts every month. Among those who do, only save an average of six percent (6%) which is below the minimum suggested ten percent (10%).

Financial literacy of professional and pre-service teachers is very low in the Philippines (Paneda & Albay, 2025; Alimon, 2024; Lopez et al, 2024; Montalbo et al., 2017). Thus, financial illiteracy is common among educators that reflect their students' financial literacy skills and the economic condition of the majority of the Filipino people.

Several studies have been conducted on the different roles of teachers for quality education. However, at present, no specific research has been made to study on the quality of life of teachers who are breadwinner mothers in making both ends meet which is a key building block to financial capability. Thus, the focus of this study is to describe and explore the lives of teachers who are breadwinner mothers and their roles in financial management in making both ends meet. Furthermore, this study also narrates the quality of life of breadwinner mothers' experiences and reflections in life in terms of their profession, economic responsibility and work-life balance.

Navigating of the lives of teachers who are breadwinners can lead us to emerging realities of gender roles in our society. The findings of this study may provide gender development workers insights on how to address gender equity, equality, decent work and economic growth particularly for women. The teaching community can also plan for work-life balance, well-being, financial literacy and investment programs in accordance to the code of ethics for teachers that are doable to improve productivity in their profession and their way of living.

Since the study trailed an atheoretical stance (Polit & Beck, 2008) this follows an inductive process (Berg, 2012). Substantive theoretical underpinnings and review of related literature are suspended since this can influence how data are being gathered and how transcriptions are interpreted (Polit & Beck, 2008; Creswell, 2014). To avoid data contamination, review of related literature and identification of substantive theory was done after data collection. This was done side-by-side with the interpretative process. To ensure that the findings were induced from the ground where the informants were in the natural world and not influenced by deduction.

Review of Related Studies

In recent times, there have been notable shifts in the roles and responsibilities of employment and parenting (Hwang, 2025). Women play different roles to maintain and manage a family and a home while men perceived themselves as breadwinners to earn and support the family. The proportion of working mothers and fathers who choose to stay at home is rising (Churchil et al, 2023). The norms in the society suggest that mothers staying at home give priority to her children and family above economic contribution and a career. These ideas still support the view that a woman's place is in the house, where she should spend quality time with her children on a physical and emotional level to ensure their appropriate development (Bigoni et al, 2025; Kopp et al, 2024).

As previously noted, due to their own experiences, working mothers frequently encounter negative social stigmas at the same time they struggle to reconcile their personal and professional lives (Munap et al, 2023). According to the report, full-time women often have a bad reputation in their communities and at the schools where their kids attend, since they believe that they are not as involved in household chores and that they are neglecting their roles as mothers and housewives. Parenting decisions may be influenced by feelings of inadequacy in their function as moms. Lacking emotional, social, and political support for their choice to stay at home, working women experience pressure to keep working. Stay-at-home dads frequently face backlash, with labels such as "lazy," "taking the easy way out," or "unmanly." (Hwang, 2025; Barigozzi et al, 2025; Dunn et al, 2011).

Because of the unequal allocation of family responsibilities, women frequently experience more difficulty juggling work and family obligations (Elegbede & Abidogun, 2023). According to the study of Hong et al (2025) women frequently shoulder a disproportionate amount of childcare and home responsibilities, which can provide serious barriers to their professional success. Most of the time, women are viewed as having to take care of the family's financial matters in addition to working.

Even though more and more women are supporting themselves financially, they usually still bear the majority of the childcare responsibilities. The salary gap is narrowing even though women still make less than males. According to Lusardi & Mitchell (2023), women have lower lifetime earnings and retirement savings but live five to ten years longer than males on average. Even with women's financial advancements and increasing financial prominence, there is still a noticeable economic gender gap (OECD, 2023; IMF, 2020).

Studies have demonstrated a link between responsible financial behavior and financial knowledge, as highlighted by Lusardi & Mitchell, 2023; Montalbo et al, 2017; van Rooji, Lusardi, and Alessie, 2012). According to the study of Manalo et al (2023), financial behavior has the strongest effect on teachers' financial well-being. Thus, women may advance by having a strong financial education that gives them the skills and information needed to accumulate the money needed to sustain themselves, their families, and their communities.

A Center for American Progress (2025) analyzed that large group of working women are breadwinners in economically developed countries like the United States which shows the shifting of gender role of the sole male breadwinner model. Thus, women in the workforce face the challenge in dealing their jobs and managing their family responsibilities (Fry et al, 2023). This implies that although working mothers who take on non-traditional roles find them empowering, they frequently feel compelled to defend and explain their decisions. On the other hand, stay-at-home-fathers have high level of role satisfaction and choose to stay-at-home with their children are likely to feel satisfied with their role (Guansing et al, 2023).

As more women are entering the workforce, they have not reduced their caring responsibilities and the amount of work they do outside of employment. More hours of housework were spent than men even as their share of household earnings increased (GEPI, 2023). The report showed mothers spent twice as much time on childcare and household work combines. Hence, there exist a free-time gender gap with women having 13% less free time than men, on average.

Methodology

This study utilized interpretative phenomenology to describe, identify the essence and interpret the lived-experiences of teachers who were breadwinner mothers and teaching basic education in the city and the province of Cebu. These teachers had a role in improving their family standards, and identifying its essence. The domain of inquiry focused on the (1) lived experiences; (2) financial management and the (3) quality of life.

Fifteen (15) key informants were chosen using purposive sampling. They were teachers who were breadwinner mothers and have a role in improving the quality of life in their family. They were working with colleagues, family members, politicians, community members, employers, and others as they teach basic education students. They were earning twenty thousand pesos (P20 000.00) to thirty thousand pesos (P30 000.00) having four to five members in the family to support in terms of their basic needs such as food, clothing, shelter, medicine and education of their children.

Auxiliary informants were purposely selected to authenticate the assertions provided by the primary informants.

The primary tool used in the study were the researchers themselves (Polit & Beck, 2008). This highlights the function of the researchers in the interviews, observations and interpretative process. Interviews were highly unstructured. All sessions were audio-taped to facilitate recording of the interactive process and data gathered were deleted after the conduct of the study.

Every informant participated in many unstructured interviews at different times to guarantee rigor in qualitative research. The following procedures were used to increase the study's credibility: 1) Person triangulation, in which auxiliary informants confirmed the statements provided by key informants; 2) Time triangulation, in which the same questions were asked at various times; and 3) Method triangulation, which comprised multiple individual interviews as well as observations to corroborate statements and the researchers' own reflections. The entire investigation was conducted with the utmost ethical standards.

All information gathered was based on interviews and observations were audio-recorded, transcribed and were coded for thematic analysis using Van Manen Method for phenomenological interpretation.

Ethical considerations were reflected prior to the start of this study. The informants completed a consent form indicating their willingness to engage in the interview and guaranteeing their anonymity and confidentiality throughout.

Results and Discussions

The breadwinner mothers' experiences and meanings are discussed in the context of the following themes.

Finding Balance in their Roles

The informants in the study are professional teachers who worked for five (5) to twenty (20) years in the Department of Education in the city and province of Cebu. These teachers earned around twenty-seven thousand pesos (P27,000.00) or more in a month with one to five children to feed in the family. They become breadwinners in their respective families for their husbands work as security guards, laborer, carpenter, mason, and contractual employees while others no earning job at all.

As mothers, almost all of them said that they still have to take care of their children when they arrive home from school. According to the third informant:

“It is very tiresome especially when my daughter got sick, I really have to take care of her personally and bring her to the doctor after my classes. My husband waited for me to bring our child for medical help. He was not able to bring her to the doctor for he has no money.”

Fifteen (15) informants said that they have to do some of the household chores such as cooking for the family, cleaning and washing their clothes. At night, they have to prepare their lessons for the following day. They felt tired in their daily routines and

challenged in their jobs as teachers and mothers. This was expressed freely by informants I15, I11, I8 and I1 saying:

“When I reached home from school I still have to cook for dinner and wash our clothes while the children are doing their homework. Afterwards, I have to write my lesson plans for we have visitor in school the following day. I have to prepare my class and some of the forms needed in school”. I15

“I am not a superwoman. I feel tired but there is no choice. I have to do the household chores for I cannot afford to pay somebody to help me at home or else I have to pay somebody to do these things for me which I cannot afford”. I11

“Most of my students are non-readers. They got very low scores in the division test. I cannot extend more time to give remedial classes and I don't have enough materials to use during teaching and my husband cannot understand my job and my needs”. I8

“It's really hard to balance being a mother, a wife and a teacher with my parents and younger siblings at home. Sometimes I feel like my parenting is not enough because I'm already exhausted from teaching the whole day. It is really very hard and challenging for me to manage all these responsibilities”. I1

These breadwinner moms are faced with life's struggle at home with their children, husband and even extended family members. They are also expected to perform their jobs as teachers while they are in school. They need to balance the various roles they portray in everyday life as mothers, wives, daughters and teachers with insufficient income. This result supports Khadka's (2020) study, which found that female teachers struggle to balance motherhood and their careers, making it difficult for them to do their jobs well at home and at school, and vice versa. Furthermore, this finding supports the report of UNESCO (2023) that the teaching profession is dominated by women and the working environment is becoming gradually masculinized working culture that gives little time for managing obligations both family and profession. The multi-dimensional roles that women play could be seen as stress in their attempt to balance parenting and career as they manage all these responsibilities (OECD, 2023).

If examined closely, aside from experiencing stress, breadwinner mothers who are teachers also experienced work-family conflict which affects their health and well-being. Psychological well-being is impacted by work-family conflict, according to research by Wang and Wu (2025). This means that as teachers their teaching performance is also affected and work-family role conflict would influence the learning capacity of college teachers. This finding confirms the studies of Ranjiwala (2024) and Taruc (2019) that say those who experience poor health and compromised psychological well-being, productivity in their work is affected. This is something that the Department of Education should also look into to improve the quality of education that we have. Though there are only a few of them in school, certain policies or program might be of help for these teachers.

Furthermore, Sustainable Developmental Goal 5 on Gender Equality supports that by acknowledging women's dual roles as educator and breadwinner in the family, certain policies in the workplace can empower them to thrive professionally and economically. Likewise, Sustainable Developmental Goal 8 on Decent Work and

Economic Growth ensures work-life balance of women and recognizes their economic contribution in the society.

Struggling in making both ends meet

Teachers who are breadwinners were engaged in selling cosmetic products, hog raising and having credit loans. They are resourceful as they utilize their talents as hosts and singers at events, and some of them sell things online to supplement their modest income (Carino, 2021). They had to budget well and buy only things that are needed for the family. Though they want to buy something for themselves, they gave priorities to the basic needs of the family like food and medicine. They had bank loans or credits for sending their children to school especially in college. This contention was expressed by the informants like:

“I sell beauty products to teachers in our school at the same time I loaned money from the bank so that I can pay the tuition of my children who are college students. I have to budget the money I earned after deductions from the loans that I have in the bank for it is not enough.” 15

“I have to buy medicine daily for my hypertension and my salary is not enough for the needs of my family. My husband sometimes earns from his job as a carpenter but still, not enough that’s why I have to loan my salary...anyway I can easily avail credits and loans as a public school teacher even if I still have a balance from the previous loan.” 16

Although breadwinner mothers have monthly income as teachers to support the family, they felt the obligation to earn more or to engage in loans so that they can financially support their family. They are usually perplexed and powerless due to financial hardships (Baloyot et al, 2023). Being the main providers in the family is a financial challenge for them for they have to spend more than what they earned.

Breaking the cycle of spending more than what the teachers earn is a manifestation of teachers’ lack of financial education. Based BSP 2021 Financial Inclusion Survey (FIS), financial literacy remains a concern for many households — not just for singles or youth, but potentially for families under strain due to financial obligations. Until now, this is manifested by the lives of the teachers who are the breadwinners in the family. Teachers’ lack of financial literacy measures may negatively impact the financial well-being of women as cited by OECD, 2023. and they may face some difficulties in paying them (Hasler & Lusardi, 2017).

The financial literacy skills of these teachers in terms of credits or loans is manifested when they could not pay the previous loan and added another loan or credits for the family needs. According to the study of Pinzon (2022) a large number of teachers in public schools used informal borrowing with high interest rates which makes them more vulnerable to predatory lenders and contributes to their debt cycle. Most of them are getting too deeply into debt, and hurting their ability to borrow in the future. Kaiser and Lusardi (2024) mentioned in their findings that women tend to have lower “debt literacy” levels than men. They engaged in more expensive ways of borrowing such as using payday lenders, pawn shops, and rent-to-own stores, hence lower level of financial literacy. Consistent with this finding, Dunn and Mirzaie

(2022) reported that women tend to engage in more costly credit card behaviors than men, such as carrying a balance on their credit cards and incurring late payment fees. Similar findings on having low financial literacy of these bread winner mothers may affect their life skills as professional teachers and parents. As cited by the OECD (2023) and Ozili (2021) financial literacy and financial inclusion are globally recognized as key determinants to life skills and significant components for economic and financial stability and development.

On the other hand, the study of Saharina (2025) revealed that teachers have impulsive spending, overconfidence, and financial procrastination further contributed to poor financial decision-making. The Department of Education would like to change the mindset of teachers and personnel in handling and managing their finances. Therefore, there is a need for teachers and the teaching staff to be financially literate. This could be done through financial education that the educational institutions can offer. According to the Philippine News Agency (2022) the Department of Education (DepEd) and China Bank Savings (CBS) partnered to provide financial wellness training for teachers and staff. It is not enough that students are to be prepared with financial education and financial literacy programs through the implementation and institutionalization of the K-12 curriculum. The teaching and non-teaching personnel should be equipped with financial knowledge and skills so that they may truly obtain the fruits of their hard labor in teaching or in their job even before retirement.

This program for teachers supports the Sustainable Developmental Goal 4 on Quality Education by giving teachers financial literacy training that strengthens their well-being and equips them to model and teach responsible financial behavior to students. Likewise, the partnership with a private financial institution are encouraged under Sustainable Developmental Goal 17 to support sustainable development initiatives.

Quality of Life in juggling Career and Family

Breadwinner mothers also had some wants and desires for things and activities for leisure. They want to enjoy and relieve themselves from stress and pressures in school and at home. However, they could not afford for the luxury and comfort for they had to set priorities for the needs of the family. This is manifested when Informant 2 says;

*“Many times I wish I could go shopping for myself and buy things that I want to have like new dress or gadget or just watch the latest movie ... just like what my co-teachers do. I just want to relax from the situation at home and in my classroom but I cannot afford to do so. My family is my priority, so I have to make sure that I can provide my family’s needs.”*¹²

The narration shows that these teachers as breadwinner mothers had to take the responsibility not just in managing their household and their classes but also ensuring financial stability at home by sacrificing what they want. This finding is congruent with the study of Olivieri et al (2024) and April & Soomar (2013) stating that the greatest sacrifice of the breadwinner women is the responsibility in managing their household and taking care of the children and making certain of the family’s financial stability.

It was also noted that the lack of time to take care of themselves breed intrinsic disappointment and discontentment of these breadwinner mothers. These women who are mothers and teachers perceived that they also need to take care of themselves or to

be taken care of by the family members. It has been observed that they are less happy and satisfied with their own lives (Ponce, 2024). This issue was shared by the following informants saying;

“I was so tired from school but I have some children to take care when I reached home from school. They are my priorities especially if one of them is not feeling well. It is really draining on my part and physically I am exhausted and I need some tender loving care. IIO”

This sharing shows that teachers who are breadwinner mothers also need recognition and appreciation for the hard work they have done in school and at home. Their salaries are insultingly low and with the high cost of living today, it is no wonder that many of the best and the brightest in the teaching profession are now teaching abroad, or worse, have migrated to work as caregivers or domestic helpers. To this effect, the Philippine News Agency(2024) reported that the House of Congress vowed to prioritize better pay and benefits as it pledged to improve teachers’ salaries, benefits, and resources — acknowledging their heavy workload and undercompensation. Indeed, the importance and the urgency of helping the Filipino public school teachers through increasing their benefits and recognition would greatly help improve their quality of life. However, there is also a need to instill the values of professionalism and integrity of these teachers. By then, this would also greatly help the teachers who are breadwinner mothers. These actions contribute to the achievement of SDG 3, Good Health and Well-Being, by strengthening educators’ welfare, safeguarding their security, and encouraging a more balanced work–life environment.

Another informant also expressed her feelings and burden saying;

“Since my husband has no job, I am hoping that he could help me in doing the household chores and give me time to relax sometimes but unfortunately he is so relaxed like a visitor at home for He spends his time with the other woman. Maybe because I don’t have time for him anymore or he does not see me anymore as his wife”. I4

The multi-faceted role these breadwinner mothers and teachers play every day of their lives is a detriment of what they also need as a woman and as a female. Their greatest fear is when losing a family rather than money because they believe that money can be earned and found but the presence of a family cannot. This contention was presented by all of the respondents when they were sharing their reflections like;

*“at the end of the day, you go back to the family...with or without money...
 greatest fear is to lose my family...my source of income will not matter for I can still
 seek for a job but I cannot find another family”
 ... success in my job cannot compensate the failures at home. Money cannot compensate
 the value of my family.”*

Hence, it can be deduced that these women value their family more than the material things like their job or money. They willingly accepted their role with willingness in their heart as they perceive it in a positive light on being a breadwinner of the family (Elegbede & Abidogun, 2023). This means that these women could not anymore advance their careers as teachers for professional development. Similar studies have been conducted in describing multi-faceted role of the breadwinner mothers that compel them for the advancement of their careers as teachers as cited by Torres et al (2024). According to Lucifora (2021) “mommy track” is a social maturity that deters females to advance their careers. The advancement gap that mothers face is the main cause of the motherhood penalty in the workplace.

To keep their family members intact and safe they have some people to support them. Although some of the husbands do not help in doing the household chores, nevertheless, most of them help keep the family safe and healthy. For some cases, extended family members help support in managing their household by doing the household chores if necessary when the breadwinner mothers are teaching in school.

One third of the respondents had children who graduated from college and already earned a living. Through loans and credits, they were able to send their children in tertiary level. They expressed their notions and faith by saying;

*“So thankful to the ever most powerful God because in spite of all the stressful, painful
 and challenging life experiences I have, still, I am here alive and healthy. I have paid my
 loans. God is so good all the time in my life.”*

*“I was financially challenged...somebody put me down but I considered those things as a
 challenge not a pain. With the credits and loans, I had sent my children to finish college
 and now they are working abroad. I am happy and contented and grateful to God that I
 survive even if my husband earned less.”*

*“I may not be able to finish my master’s degree, but I always believe in the saying that
 “God will make a way and that God will provide.” It’s really true for my eldest is now
 working and my loans are almost paid up. I am contented and happy with what I am
 having now.”*

The narrative sharing and reflections of the teachers who are breadwinners indicate their deep faith in God. Their determination to try hard to financially support their children through loans and credits made their children finish a degree in college. As teachers, they know that education is a powerful tool for them to alleviate their families from the clutches of poverty. Their professional and personal aspirations to help their children become successful professionals align with Sustainable Development Goal 4 on Quality Education. These efforts contribute to empowering the next generation through improved educational opportunities.

Conclusion

In making both ends meet, teachers who are breadwinner mothers have multi-dimensional role to play in life. They are navigating the burden in professional, economic, and personal challenges of women breadwinners in education. In their professional role as women educators, they have fulfilled their demanding work responsibilities with strong commitment and integrity. In terms of economic responsibility, they are the breadwinners and they faced financial pressures and challenges in providing for themselves and their families. However, they continually strive to balance career tasks with family life, impacting their overall well-being and life satisfaction.

As they face adversities in life in terms of psychosocial and financial challenges, they conquered these with pride and determination to help family with their spiritual strength that gave them the conviction and contentment in life. It is recommended that teachers be provided with specific institutional policies on work-life balance, mental health and well-being, and financial support. Financial literacy and investment programs must be provided as a tool for them to acquire the necessary financial behavior, knowledge, and skills along with a network of support in school or in the community. Overall, policies that align with Sustainable Development Goals 3, 4, 5, 8, and 17, supportive, gender-responsive, and designed to empower women both academically and financially should be implemented to enhance the well-being, career development, and economic stability of breadwinner women and teachers.

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Designing a Social Marketing Mechanism Approach to Juvenile Crime Among 14–17-Year-Olds in Azerbaijan

*By Habib Mahmudov**

The problem of crimes committed by children aged between 14 and 17 has become more noteworthy in Azerbaijan in the last 5 years. With its wide range of juvenile delinquency at this age group, the importance of a timely action is extremely crucial. Although, traditional methods of these type of crime solving cases might be valuable, implementation of social marketing practices can significantly boost the process of mindset shift and behavioural change for not only the targeted age group, but also the age dimensions of 18-24, 25-29, and 30+ in Azerbaijan. Formulation of a right social marketing mechanism with a sound and clear communication could have a positive effect on the representatives of this age group and ideally prevent the reoccurring and new scenarios related to different forms of crime in Azerbaijan. During the implementation phase the CSD-IES framework, an acronym created from the six stages of the framework: consumer research, segmentation, social program design, implementation, evaluation, and sustainability, can ease the whole process and bring clarity to the execution of the social marketing program designed particularly for the set social problem.

Keywords: *Social problem, social marketing mechanism, crimes, children, Azerbaijan.*

Introduction

Juvenile criminality is an ongoing and changing societal issue that threatens youth development, social cohesion, and national security. Children aged 14 to 17 in Azerbaijan are increasingly involved in both direct criminal activities and crimes done under peer pressure or in group settings. Long-term data indicates that overall offences have decreased throughout the 1990s, but in recent years, there has been a rebound, especially in serious crimes, which raises questions about how successful current measures are (The State Statistical Committee of the Republic of Azerbaijan, 2024a, 2024b). Furthermore, modern treatments are reactive and punitive, rather than preventative or rehabilitative—despite worldwide evidence that community-based and communication-driven solutions are more effective in addressing the fundamental causes of young crime (Farrington and Welsh, 2007).

The aim of this study is to analyse long-term patterns in juvenile criminality in Azerbaijan and create a targeted social marketing mechanism to avoid future development among teenagers aged 14–17. The study has the two following objectives:

1. To investigate the statistical patterns and kinds of juvenile crimes perpetrated or involving children in Azerbaijan from 1993 to 2023;

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2. To create a behaviour-focused social marketing framework geared on reducing teenager criminality through community involvement and preventive communication.

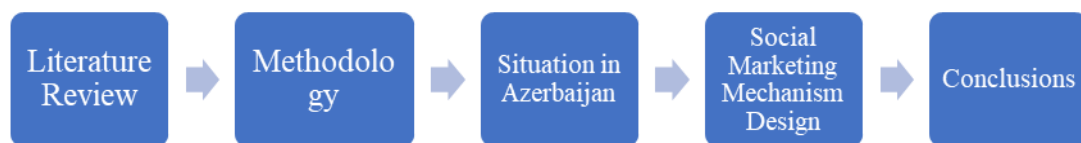
Despite rising concern, there is a scarcity of thorough, data-driven research in Azerbaijan that examine long-term patterns in teenage criminality and propose strategic, behaviour-based solutions. This study addresses that gap by using statistical analysis and social marketing concepts to create a targeted, preventative approach for reducing teenage crime.

This study seeks to investigate the fundamental causes of juvenile offenders in Azerbaijan by examining crime patterns over the last three decades using statistical and visual techniques. In Azerbaijani regulations, juvenile delinquency refers to criminal behaviour perpetrated by persons who are legally minors, often aged 14 to 17. Such behaviour can vary from petty violations to significant, violent crimes, and it is frequently driven by peer pressure, socioeconomic circumstances, and a lack of supervision. Furthermore, the study seeks to suggest a targeted, evidence-based social marketing mechanism—a method that use commercial marketing strategies to induce voluntary behavioural change for the benefit of both people and society. This approach will be supported by a behaviour-change framework that uses communication tactics, incentives, and community-level participation to drive intervention design. These basic principles will be expanded upon in the subsequent literature review and conceptual framework sections. Policymakers, educators, law enforcement, and community stakeholders who are striving to lower juvenile crime and provide safer conditions for adolescent development are among the target audience members.

Precisely, conduction of this study is important and timely due to the unavailability of such type of research in the country, in terms of understanding the social problems and addressing them with social marketing initiatives. Given the case of Azerbaijan, this study will help to fill the gap in the current state of research on juvenile criminality and find possible solutions in form of a social marketing mechanism, that will help in not only resolving this pressing issue but also assist in prevention of such negative behaviours to reoccur in the future.

Following is a roadmap outlining the key components of the paper:

Chart 1. *Roadmap to the Study*



Source: Self elaboration.

Literature Review

This chapter presents multiple definitions of “Social Problem” and “Social Marketing” terms, as well as theoretical overview and breakdown of CSD-IES framework.

Social Problem

The concept of a “*Social Problem*” has changed significantly over the course of sociological literature, with scholars focusing on a variety of aspects such as norm breaches, public concern, negative outcomes, and the need for group action. Although early definitions set the groundwork, subsequent contributions have expanded our knowledge of how social issues arise, are identified, and are resolved—often by examining them through the prisms of cultural norms and structural inequalities.

Among the first to characterise social issues as circumstances that a sizable segment of society views as undesirable or detrimental were Charles Cooley (1909) and Robert Merton (1938). Merton emphasised that the agreement in society that intervention is necessary is just as much a part of social issues as the actual state. These early formulations set a standard for seeing social difficulties as widely acknowledged disturbances of the social order rather than only as objective harm.

By more clearly connecting social issues to departures from cultural norms and expectations, other academics expanded on this. Thompson, Hickey, and Thompson (2016), for instance, characterise social difficulties as circumstances that prevent people from realising their full potential, citing prejudice, unemployment, and poverty as examples. In similar terms, Schaefer (2024) and Marger (2013) define social issues as actions or circumstances that deviate from generally acknowledged social norms and values and have a negative impact on people or communities. These viewpoints are especially pertinent to comprehending juvenile criminality, which frequently deviates from both legal requirements and societal norms about the conduct of young people.

The notion of public interest and consensus is also emphasised in several formulations. According to Coleman (2005) and Skocpol (1995), a condition is considered a social problem when a significant segment of the public believes that it has to be addressed. This perspective is supported by Eitzen, Smith, and Zinn (2023), who claim that when individuals perceive a discrepancy between social reality and normative expectations, a social issue occurs. The significance of shared belief and concern is also emphasised by Thio, Taylor, and Schwartz (2018), who emphasise that a condition is considered problematic when it deviates from expected social behaviour and sparks public desire for change.

A different group of academics emphasises the systemic and structural causes of social issues. According to Secombe and Kornblum (2018), these are circumstances that lead to damage and inequality and are caused by broader societal structures and power dynamics. Although Corsaro (2015) points out that social issues frequently elicit criticism and punishments because they are incompatible with common ideals, Rubington and Weinberg (2011) highlight the need of self-awareness in recognising

detrimental societal situations. Additionally, Macionis (2017) emphasises how social issues can threaten the welfare of society and turn into a public dispute.

A synthesised and practical viewpoint is provided by Giddens, Duneier, and Appelbaum (2021), who characterise a social issue as a state or conduct that has a detrimental impact on a significant number of people and is generally acknowledged to require intervention. When defining topics like teenage crime in complicated social situations, this dual focus—on public awareness and broad impact—captures both the subjective and objective aspects of social concerns.

Crucially, Best (2020) and Leon-Guerrero (2018) provide the concept of “*Claims-making*”—the method by which people or organisations identify and promote the acknowledgement of an issue. This perspective holds that social issues are not just harmful circumstances but also labels that are used in institutional structuring and public discourse. Butler and Drakeford (2003) and Kornhauser (1984) both contend that social issues are socially generated through shared awareness, concern, and action.

In a broader sense, the term of “*Social Problem*” has seen development in many different aspects that are related to social norms and how an individual can see the changes and actions happening in its own community. By noticing or identifying the situations that can be described as harmful or damaging to the community’s quality of life, it is possible to register the first instances of a potential social problem in a society and later have a clearer understanding of what is going wrong and what should be done next. Social problems can be shaped in many ways and forms often remaining unseen or undetected. Thus, working on them requires attention to detail and close work with data.

Juvenile criminality in Azerbaijan obviously meets the requirements for being classified as a social problem under both traditional and modern sociological theory. It defies social norms, causes great anxiety, and necessitates coordinated institutional responses. Even while there were 433 out of 36,494 recorded offences in 2022, the total number of crimes committed by children may seem statistically little, its social impact is significant, especially when considering public perception, youth vulnerability, and long-term societal harm (Better Care Network, 2022).

The country has worked hard to bring its juvenile justice system into compliance with international standards. Azerbaijan has enacted age-appropriate sentencing policies, such as non-custodial alternatives to incarceration, adopted the Beijing Rules and Riyadh Guidelines, and added juvenile-specific procedures to its Criminal Code since ratifying the UN Convention on the Rights of the Child in 1992 (Asgarova, 2023). But even with these advancements, there are still a lot of procedural and structural issues. There is a gap in addressing the underlying causes of juvenile delinquency due to the absence of comprehensive early intervention services, mentorship programs, and outreach oriented by peers.

It is crucial to comprehend these processes in order to formulate a behavioural intervention like social marketing, which seeks to change the public conversation, involve communities, and affect social norms in addition to reducing harmful habits. Particularly helpful for this study are definitions that highlight systemic damage, social construction, and public concern, including those provided by Best (2020), Seccombe and Kornblum (2018), and Leon-Guerrero (2018). They defend viewing juvenile

criminality as a social issue that calls for community-driven solutions rather than merely a legal breach.

The reasoning behind the study's more comprehensive intervention method is guided by this conceptual framework. It becomes feasible to address juvenile criminality through strategies that affect behaviour, subvert societal narratives, and establish settings that support young people's development when it is framed as a socially created and structurally based issue. Building on this framework, the next sections examine how social marketing might be used as a successful tool in Azerbaijan to reduce teenager crime.

Social Marketing

The connection between the pursuit of public benefit and marketing principles gave rise to the idea of "*Social Marketing*". Wiebe famously used the phrase in 1951, raising the question of whether virtues like brotherhood might be promoted as well as consumption goods. The basis for a new area of applied marketing theory that focusses on behavioural and societal transformation rather than financial success was established by this fundamental question. "*Social marketing is the design, implementation, and control of programs calculated to influence the acceptability of social ideas and involving considerations of product planning, pricing, communication, distribution, and marketing research*", according to Kotler and Zaltman (1971), one of the first thorough definitions. Their approach proved that behaviour-based treatments aimed at social issues might benefit from the traditional four Ps of marketing: product, price, place, and promotion.

Additional conceptual improvements came as the field developed. The combined objectives of social and economic advancement were highlighted by Lazer and Kelley (1973), who established social marketing as a discipline that addresses the social effects of marketing tactics. This signalled a shift in emphasis from advancing concepts to assessing societal results. A stronger behavioural focus was introduced by Andreasen (1995), who made the case that social marketing need to give voluntary behavioural modification top priority. This sets it apart from coercive policy measures or top-down communication, and he presented a paradigm that is based on behavioural research rather than merely messaging. The behavioural emphasis was expanded upon by Kotler, Roberto, and Lee (2002), who emphasised that social marketing should result in quantifiable advantages for both people and society. More organised and strategic planning models were developed as a result of their framework. French and Blair-Stevens (2005) expanded on this by proposing the concept of value co-creation with the audience, which holds that programs should benefit both individuals and the group overall. This represented a change in perspective towards a more reciprocal and participatory view of intervention design.

Stead et al. (2007) and Saren et al. (2003) introduced ethical reflection into the mainstream discourse, which provided a critical perspective to the area. They maintained that social marketing shouldn't turn into manipulation or influence. Transparency, equity, and inclusiveness were highlighted in this critique. These revelations also opened the door for additional criticisms, including those made by

Hastings and Angus (2011), who emphasised the need to recognise and rectify the power disparity between target consumers and social marketers. According to Grier and Bryant's (2005) consumer research perspective, social marketing works best when it takes into consideration the social and psychological factors that influence behaviour. This signalled a shift towards evidence-based planning, user profiling, and audience segmentation. With a deliberate focus on behavioural goals, Kotler and Lee (2008) later repeated the six-stage planning structure that the National Social Marketing Centre (2006) had institutionalised.

In order to support successful programs, Dann (2010) provided an institutional viewpoint, highlighting the significance of organisational capacity and long-term governance. This was in line with ISMA, ESMA, and AASM's (2013) definition of social marketing as an ethically sound and value-driven approach. Their concept stands out because it distinguishes social marketing from commercial advertising by emphasising stakeholder engagement and the use of best practices. This viewpoint was further developed in 2017 by ISMA, ESMA, AASM, and the Social Marketing Association of North America (SMANA). Social marketing, according to ISMA et al. (2017), is *"the development and integration of marketing concepts with other approaches to influence behaviours that benefit individuals and communities for the greater social good"*. In addition to highlighting the significance of sustainability, systems thinking, and global applicability, this formulation placed a strong emphasis on ethics, evidence-based practice, and inclusion.

This ethical perspective has been expanded by Eagle et al. (2016), who emphasised that habit modification should be based on social equality and serve the public interest. Unlike generic messages, their definition encourages community-led, diversity-sensitive strategies. Similar to this, Duane et al. (2016) highlighted that the main objective of social marketing is the welfare of society, setting it apart from commercial marketing's profit-driven objectives. The scope of social marketing was expanded to encompass institutions, policies, and systemic change by Baptista et al. (2020) and Baptista, Pinho, and Alves (2021). They emphasised the importance of influencing not just people but also the institutional actors and policy frameworks that determine behavioural choices. As a result, social marketing became an advocacy-focused strategy and was connected to civil society involvement, governance, and the law.

The use of marketing principles to create markets that are more efficient, sustainable, and equitable in promoting people's well-being and social welfare" is how Lefebvre (2011) described social marketing. This brought in a viewpoint on economic justice, bringing social marketing into line with environmental objectives. The significance of solution exchange was highlighted by Lee et al. (2011), who defined it as a process of providing communities and people with value that benefits both parties. These revelations gave stakeholder participation and long-term consequences more weight. Social marketing, according to the International Social Marketing Associations (ISMA, ESMA, and AASM), is *"the development and integration of marketing concepts with other approaches to influence behaviour that benefits individuals and communities for the greater social good"* (2013). By combining systems thinking, research, ethics, and strategic planning, their concept established the contemporary reach of social marketing.

Baptista et al. (2020) reinforced a public-good focus by adding that “*Social marketing is not intended to benefit the organisation that promotes the marketing actions, but rather to benefit individuals’ welfare or promote societal good*”. Baptista, Pinho, and Alves (2021) also emphasised the importance of policy influencers and institutional players, emphasising that social marketing is not limited to influencing individual conduct but also involves influencing the contextual actors that surround that activity. The normative distinction of social marketing was highlighted by Duane et al. (2016), who found that “*the salient difference between social marketing and all other subareas of marketing is that social marketers’ objectives are the wellbeing of society while other marketers’ aims are stakeholders’ maximum wealth*”. The practice’s moral, non-profit foundation is reaffirmed by this.

Social marketing has its limits even if it provides effective tools for modifying behaviour and advancing social good. If campaigns are inaccessible to marginalised populations, critics contend, it might inadvertently perpetuate social inequality. Additionally, when persuasive strategies are used without ethical protections, there is a chance of manipulation. Furthermore, social marketing cannot fix deeply ingrained societal issues on its own since behaviour change frequently depends on larger structural factors. For instance, Hastings (2011) and Stead et al. (2007) cautioned against excessively straightforward solutions that disregard socioeconomic variables including poverty, unequal access to education, or lack of services. Without addressing these underlying issues, campaigns that focus on individual conduct run the danger of blaming the victim or failing to bring about long-lasting change. Consequently, community involvement, policy support, and long-term monitoring systems must all be incorporated into effective social marketing.

When looking at social marketing as a discipline, it is crucial to keep in mind that its initiatives are based solely development of good habits and positive change. By combining different theoretical knowledge, social marketers, can use the fundamentals of social marketing theory and apply it to formulation of social marketing programs, that include social marketing mechanisms, tailored to the needs of the affected by a particular social problem target audience. If implemented correctly, social marketing can have a positive and long-lasting result, which is data-driven and evidence-based. The process of social marketing is closely related to the sustainability of changed behaviour that should be monitored and evaluated from time to time, in order not to miss any significant negative changes in the behaviour. This section is discussed in the following section of the paper.

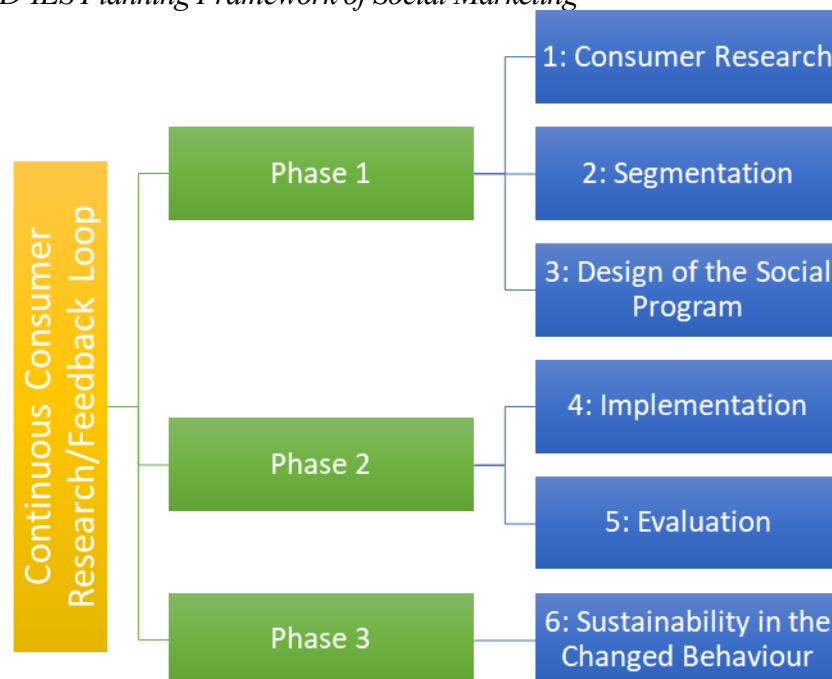
In summary, research indicates that social marketing is an ethically directed, interdisciplinary strategy that aims to influence voluntary conduct for the good of society. Basic message promotion (Wiebe, 1951; Kotler & Zaltman, 1971), behavioural influence (Andreasen, 1995), and systemic and ethical program creation (Eagle et al., 2016; ISMA et al., 2013, 2017) are some examples of how definitions have changed over time. These modifications reflect an increasing realisation that ethical sensitivity, systemic thought, and technical accuracy are all necessary for long-lasting social effect. Because of its conceptual depth, social marketing is especially well-suited to tackle complicated issues like teenager crime, where institutional hurdles, peer pressure, and behavioural standards all come together. For the objectives of this research, social marketing offers an ethical compass in addition to a strategic framework for creating

interventions that benefit the target population (children at risk) and society as a whole. As a result, a well-designed social marketing mechanism may greatly lower juvenile crime and promote more resilient, inclusive communities in Azerbaijan.

CSD-IES Framework

Using conceptual frameworks is essential to maintaining a successful social media marketing strategy. CSD-IES is one of these social marketing frameworks. The CSD-IES framework, an acronym derived from the six phases of the framework, consists of six steps: consumer research, segmentation, social program design, implementation, evaluation, and sustainability. It is a flexible and dynamic framework that helps academics, practitioners, and social marketers create, implement, and evaluate successful, long-lasting social marketing campaigns that aim to change or influence certain behaviours while taking into account the resources at hand. An illustration of the CSD-IES social marketing planning framework may be found below:

Chart 2. CSD-IES Planning Framework of Social Marketing



Source: Akbar et al., 2021, p. 270.

Three phases—two primary and one secondary—follow the conclusion of the primary campaign in accordance with the CSD-IES planning framework for social marketing. Three components make up the framework's initial phase: segmentation, customer research, and social program creation. Since it looks at many research methods to create the ideal target population, the consumer research component is important to the entire social marketing strategy. Both quantitative and qualitative research techniques, such as surveys, questionnaires, and interviews, are used in this

process. The intended target audience for the following stage of the framework is developed based on the findings of each research technique.

By helping to comprehend the actions of the chosen segment of society arranged according to various categories and beliefs, the segmentation section of the study builds on the findings of the consumer research. The appropriate design of the social program for the social marketing campaign may be processed more easily when the available data is properly segmented. Following a successful segmentation procedure, the next stages involve creating a proper social program design. The design takes into account the many ethical concerns of the social program and is founded on the value proposition obtained from the segmentation process using an intervention mix.

The second step of implementation and assessment occurs after the first phase is finished. This section covers the various ways that the target audience might be informed about the social program's design. In order to reach the intended target audience and have a productive exchange of information and feedback regarding the social marketing campaign, it is essential to establish a two-way communication during the execution of the set design of the social program using various social media channels, such as Facebook, X, and LinkedIn. In this procedure, advertisements and endorsements are also quite important. In the execution phase, a well-crafted message is essential to accomplishing the main objectives of the chosen social media marketing strategy.

The last stage of the evaluation of the main phases and the second half of the second phase are equally as crucial as the earlier stages of the social marketing campaign. This section evaluates the campaign's overall effectiveness and identifies the main advantages and disadvantages for future development. The performance of the corresponding social marketing campaign throughout its execution must be distinguished from its short-term and long-term, primary and secondary aims and objectives. This stage also makes clear the goals of the social marketing campaign, its drawbacks, and its potential for future iterations for a larger target audience with a longer list of goals for solving a social issue or cause for the targeted segment of society.

The third and last stage of the social marketing campaign is sustainability in the altered conduct, which is secondary to the entire process. This stage is crucial for determining the campaign's overall good and negative aspects and identifying the main conclusions. It is also helpful for creating value by showcasing achievements and creating a system of rewards for acquiring or giving up certain habits. Furthermore, this section ensures that the chosen social causes and social problems are resolved in order to generate positive behaviours in the majority of society, supporting the initial social marketing campaign for potential future implementations for the target audiences.

All things considered, social marketing has promise for resolving several significant social issues and causes in various spheres of society. In order to create a successful social marketing strategy and plan that follows a positive flow of necessary stages and actions to accomplish the intended objective or target for the chosen target group, it is essential to have a clear grasp of the social cause or problem. The CSD-IES planning framework of social marketing, which consists of several stages and procedures, is an intriguing structure for this procedure. The aforementioned framework has enormous potential to address significant social issues and challenges in contemporary society if properly implemented. To monitor changes and

advancements, whether positive or negative, it is crucial to periodically review and examine the data on consumer behaviour in the chosen segment of society. As a consequence, the active social causes and issues facing contemporary society will be resolved using a more sophisticated method.

Methodology/Materials and Methods

This study used a descriptive statistical analysis to look at trends and patterns in the crimes committed in Azerbaijan between 1993 and 2023 affecting minors between the ages of 14 and 17. The following crucial questions served as the basis for the research:

- How have the types and frequency of crimes committed by 14–17-year-olds changed over the past three decades?
- How do direct and participation juvenile engagement in illegal activities differ from one another?
- How many of these offences fall under the grave or serious category, and how has this evolved over time?

In order to capture the long-term post-Soviet transition era, which included major economic, legal, and social changes in Azerbaijan that would have impacted teenage behaviour and crime trends, the 30-year period (1993–2023) was chosen. Additionally, this period corresponds with the availability of reliable statistical data from national databases.

Data Sources

Two main datasets were obtained from the State Statistical Committee of the Republic of Azerbaijan for this study:

1. Crimes Directly Committed by Children Aged 14–17, disaggregated by type of crime and year (The State Statistical Committee of the Republic of Azerbaijan, 2024a).
2. Crimes Committed with the Participation of Children Aged 14–17, which includes both direct and indirect (accomplice) involvement (The State Statistical Committee of the Republic of Azerbaijan, 2024b).

These datasets, which were assembled from judicial and state documents, are openly accessible. Despite being widely regarded as trustworthy, they have flaws in terms of thoroughness and may underreport crimes, particularly those involving kids. These datasets lacked an independent audit or validation.

Terminology and Classification

The Azerbaijani legal system uses the Criminal Code to classify crimes into “*Grave*” and “*More Grave*” categories. Serious crimes including murder, aggravated assault, rape, robbery, and armed theft are usually included in this category. The national legal framework (Criminal Code of the Republic of Azerbaijan, 2015) was used to validate the definitions.

Data Cleaning and Transformation

The datasets were initially made available in Excel versions that were organised. The procedure for cleaning entailed:

- Eliminating yearly totals with irregular formatting or duplicate entries;
- Standardising category and column names;
- Interpolating missing values where necessary (for example, if blatantly incorrect zeros were entered between regular yearly values);
- Combining subcategories into primary crime types for analysis.

Tools and Software

Microsoft Excel was used for all data processing, cleaning, and analysis. This included leveraging its built-in tools, including PivotTables, conditional formatting, formulas, and charting capabilities. In addition to visualising temporal patterns and category-specific changes, these methods made it possible to create percentage distributions and comparison graphs (such as line charts, pie charts, and heatmaps).

Analytical Approach

Frequency counts, percentage distributions, and visual trend mapping were all used in the descriptive analysis. Also, inferential statistical methods like regression and significance testing were used to draw more statistically and analytically sound conclusions for this specific case.

Juvenile crime statistics were compared to population estimates of 14–17-year-olds derived from Azerbaijan State Statistical Committee demographic data in order to account for population trends (2024c). Crimes per 100,000 juveniles, or per capita crime rates, were calculated to account for changes in the number of young people over time.

Ethical Considerations

Anonymised secondary public data without personal identifiers was used in the study. There was consequently no demand for ethical approval. Nonetheless, all of the time, the ethical norms of confidentiality, academic fairness, and proper data handling were closely followed.

Limitations

- The lack of a breakdown by socioeconomic position, gender, or geography limited the analysis's level of detail.
- Unreported offences are not included, only officially registered and reported crimes are.
- As reporting standards and procedures change over time, data quality may also change.

The study offers important insights into long-term patterns in youth crime and contributes to the development of social marketing strategies for prevention and intervention, despite these limitations.

Social Problem of Crimes Committed Among Children Aged 14-17 in Azerbaijan

A data-driven strategy to comprehending and reducing teenage criminality is required due to the growing concern over juvenile delinquency in Azerbaijan, especially among youths between the ages of 14 and 17. The results of two extensive datasets covering (1) crimes directly perpetrated by juveniles and (2) crimes in which children participated or where accomplices are combined in this overview. The datasets cover the years 1993–2023. When taken as a whole, these publications offer a multifaceted perspective on the sorts of crimes, trends in juvenile crime, and the changes in risk patterns over the past thirty years.

Key categories including theft, robbery, physical injury, and serious crimes like planned murder are highlighted in the first study, which focusses on the kinds of crimes directly perpetrated by youth between the ages of 14 and 17. Important insights on behavioural patterns, changes in criminal activity over time, and the evolving seriousness of offences are provided by this dataset. The second paper provides a more comprehensive picture of juvenile engagement in criminal networks, peer-driven offences, and collaborative criminal activity by extending this research to crimes in which minors participate.

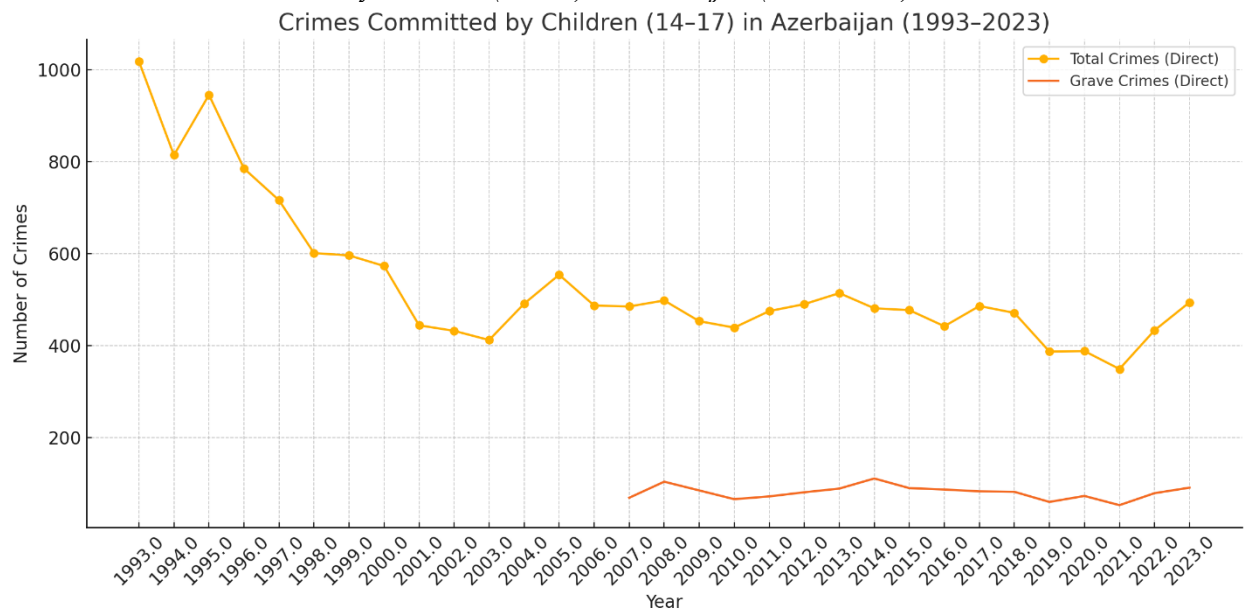
A more thorough comprehension of the socioeconomic, psychological, and community-level elements influencing adolescent criminality can be achieved by examining both direct and participation involvement. Trend analyses, percentage comparisons, and visualisations such as pie charts, line graphs, and heatmaps are used to accompany the reports. In addition to showing the general decline in juvenile crime

over time, these tools also highlight new issues, such post-pandemic increases and the ongoing percentage of major crimes.

Together, the results offer a crucial basis for designing social interventions, developing policies, and creating focused social marketing strategies meant to deter adolescent criminality. They stress that in order to create safer and more welcoming environments for young people in Azerbaijan, concerted efforts involving the media, family structures, education, and law enforcement are required.

Following are charts that visualise the situation described in both reports as well as a table showcasing three different time spans with different metrics.

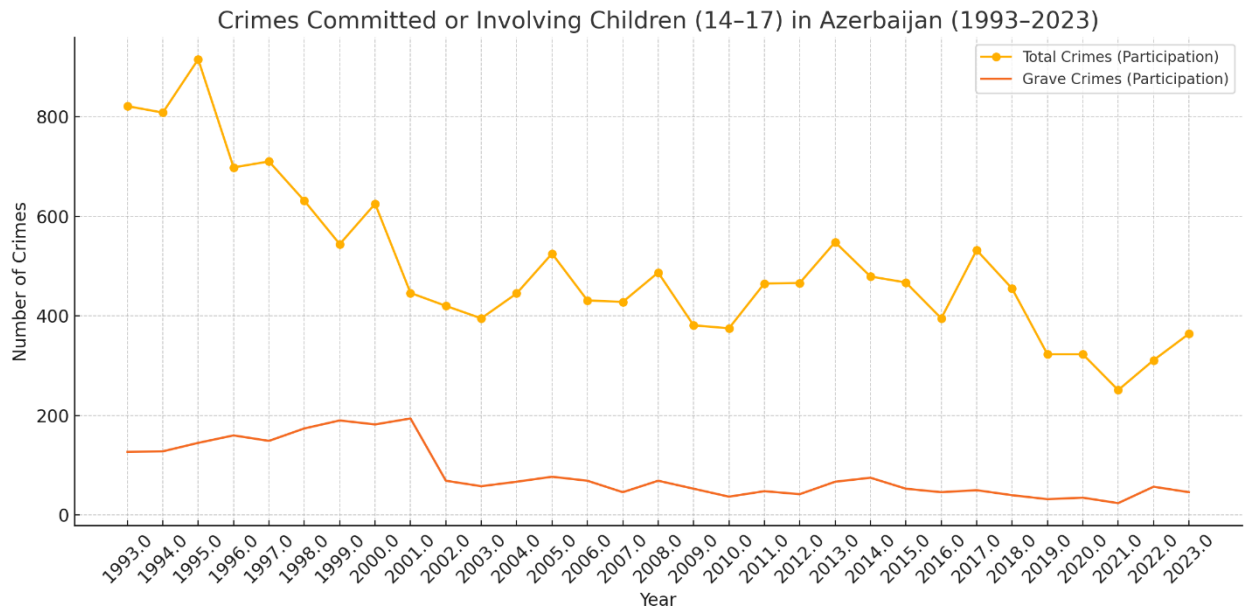
Chart 3. Crimes Committed by Children (14–17) in Azerbaijan (1993–2023)



Source: Self elaboration based on Report 1.

From 1,018 in 1993 to 388 in 2020, the overall number of crimes committed by youngsters decreased, but it then increased once more to 494 in 2023. The number of grave and more serious crimes decreased from 293 in 1993 to 91 in 2023, following a similar trajectory. A consistent decline was seen in the early 2000s, which could be related to educational reforms and sociopolitical stabilisation. There is a reversal in decrease after 2020, which may be brought on by the consequences of COVID-19, economic strain, and heightened digital vulnerability. This trend—a long-term drop in both total and serious crimes, with recent upturns—is readily shown in the graphic. The fact that serious crimes continue to account for a steady percentage of all juvenile offences (15–30%) emphasises the ongoing danger of violent and serious crimes.

Chart 4. Crimes Committed or Involving Children (14–17) in Azerbaijan (1993–2023)



Source: Self elaboration based on Report 2

In keeping with the direct crime trends, the number of crimes committed by children fell from 821 in 1993 to 364 in 2023. During the same time period, the number of serious offences involving kids decreased from 127 to 46. Participating in aided or group crimes indicates a greater exposure to organised environments (e.g., gangs, coercion) and peer pressure. Although it covers cases in which minors were not the primary perpetrators, the graphic highlights comparable trends. A more accurate picture of young people's susceptibility to criminal involvement, especially in co-offending situations, is provided by this broader perspective.

Table 1. Comparative Insights on both Datasets

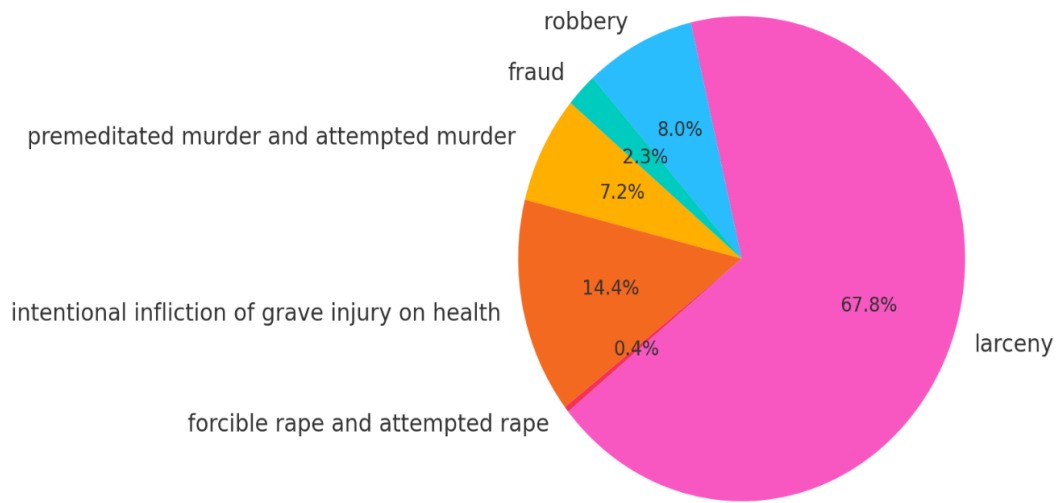
Metric	1993	2020	2023
Total Crimes (Direct)	1,018	388	494
Grave Crimes (Direct)	293	73	91
Total Crimes (Participation)	821	323	364
Grave Crimes (Participation)	127	35	46

Source: Self elaboration based on both Report 1 and Report 2.

Up until about 2015–2018, both datasets show a consistent improvement; after that, plateaus and reversals appear. The disparity between direct and participation crime statistics emphasises the necessity of peer network-focused prevention.

Chart 5. *Distribution of Crime Types (Direct Involvement, 2023)*

Distribution of Crime Types (Direct Involvement, 2023)

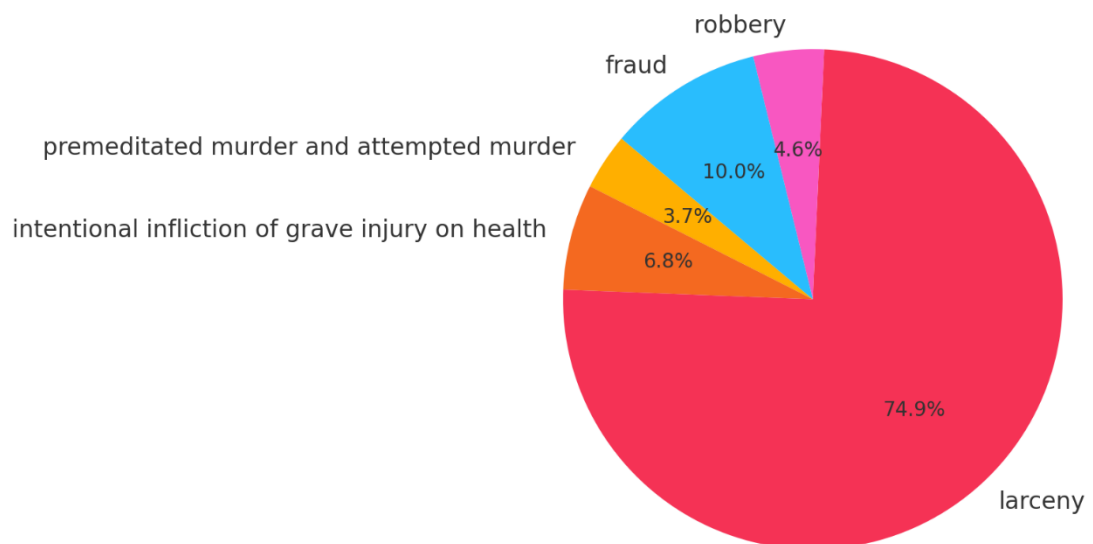


Source: Self elaboration based on Report 1.

The prevalence of larceny indicates that among adolescent offenders who commit property crimes, this offence continues to be the most common. There are also quantifiable rates of violent crimes including robbery, murder attempts, and deliberate bodily harm.

Chart 6. *Distribution of Crime Types (With Participation, 2023)*

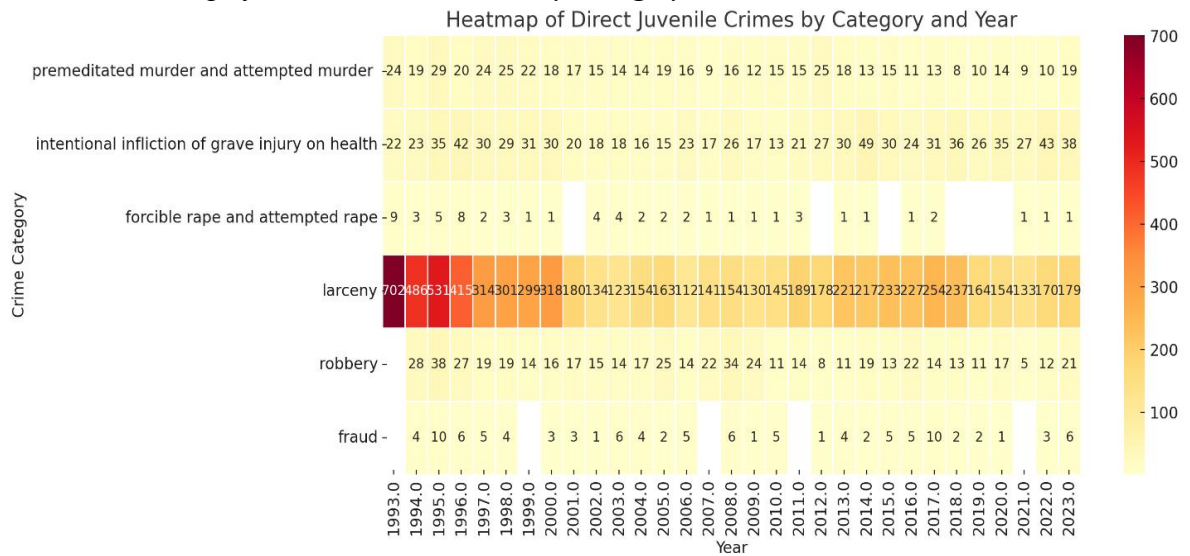
Distribution of Crime Types (With Participation, 2023)



Source: Self elaboration based on Report 2.

Robbery and fraud have a comparatively higher percentage, despite similar patterns, maybe as a result of group or older-peer influence.

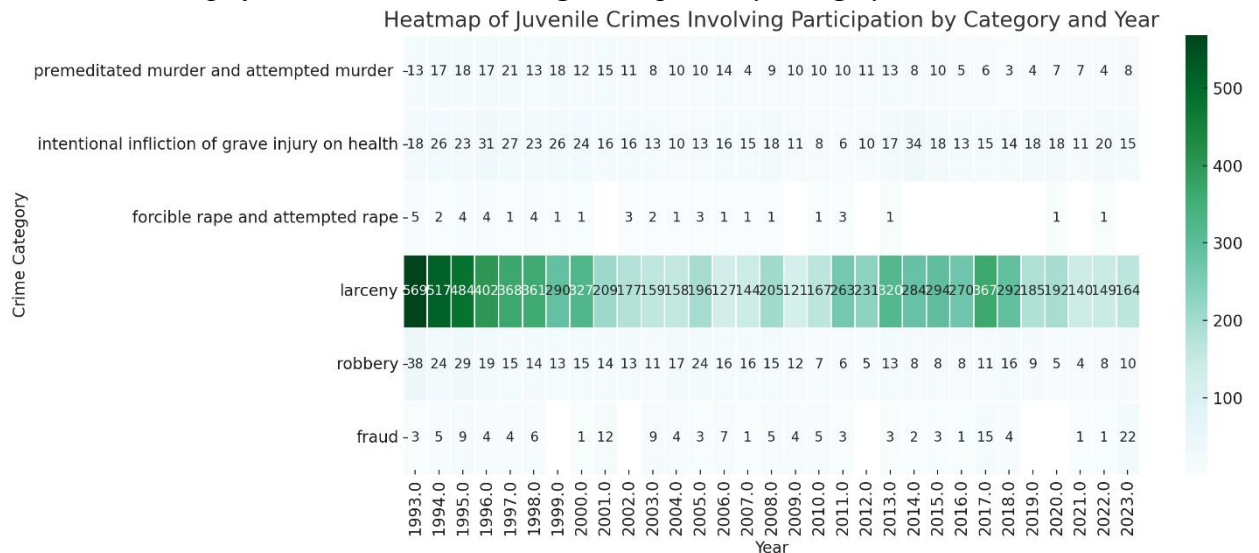
Chart 7. Heatmap of Direct Juvenile Crimes by Category and Year



Source: Self elaboration based on Report 1.

The rate of larceny is constant over the years. The mid-2000s and beyond 2020 saw increases in robberies and physical injury. The modest but consistent rate of forced rape emphasises the necessity of focused measures.

Chart 8. Heatmap of Juvenile Crimes Involving Participation by Category and Year



Source: Self elaboration based on Report 2.

Similar trends from year to year, although frequently with larger numbers—particularly for robbery, indicating peer-led offences or coordinated operations.

following 2015, there are discernible declines, with certain categories experiencing a return following the epidemic.

Following are key takeaways on crimes committed by children aged 14–17 with direct involvement:

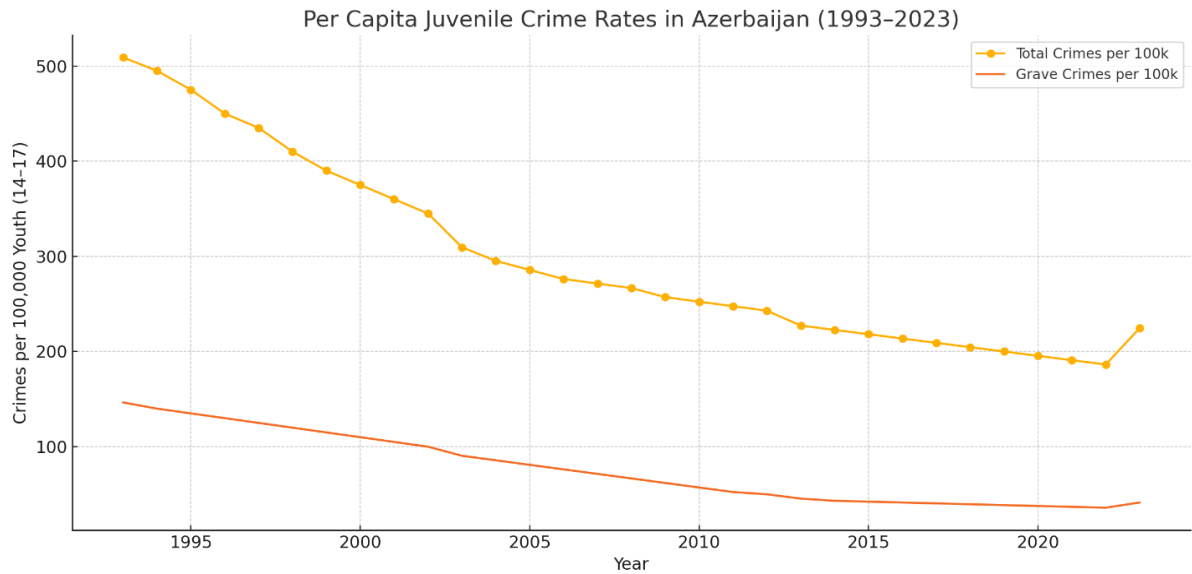
1. **Long-Term Decline:** From 1,018 in 1993 to 494 in 2023, the total number of crimes committed directly by juveniles fell dramatically, indicating a long-term improvement in juvenile conduct or control systems.
2. **Serious Crimes Continue to Predominate:** Despite a decline, 15–30% of all juvenile crimes were still grave or more serious crimes (such as murder, rape, or violent assault), demonstrating the continued gravity of the problem.
3. **Larceny as the Most Common Crime:** Robbery and physical harm are the next most common offences, behind theft. The crime profile is dominated by crimes involving property and violence.
4. **Post-2020 Reversal:** Following years of reduction, crimes started to rise once more after 2020, most likely as a result of socioeconomic hardship, educational interruptions, and COVID-19 effects.
5. **Risks by Gender and Age:** While this dataset does not break out risks by gender, worldwide patterns indicate that boys are more likely to conduct violent crimes, and risk peaks between the ages of 15 and 16.

Below are the key points on crimes committed or involving participation of children aged 14–17:

1. **Wider Range of Involvement:** Co-offending with peers or adults is one type of participation crime that exposes deeper weaknesses in recruiting and peer pressure situations.
2. **More Participatory Crimes than Direct Crimes:** The number of participation-based crimes is continuously more than the number of direct offences (for example, 364 vs 494 in 2023), highlighting the fact that many youngsters are implicated as accomplices or under the influence.
3. **Participation in severe Crimes:** Children are often involved in severe crimes, even if they are participants rather than initiators, underscoring the importance of early detection and intervention.
4. **Peer and Gang Dynamics:** Increased participation in group crimes and robberies points to the impact of gangs, peer groups, or coercive settings.
5. **Strategic Implication:** Through peer recruiting, school settings, or neighbourhood exposure, programs should not just target direct offenders but also those who are at risk of being engaged.

To better understand the displayed previously descriptive trends for the juvenile crime in Azerbaijan for the time period of 30 years a more specific incorporation of per capita adjustments and comparative trend analysis, the following visualisations are beyond raw crime counts and help better reveal youth risk patterns across time and specific contexts.

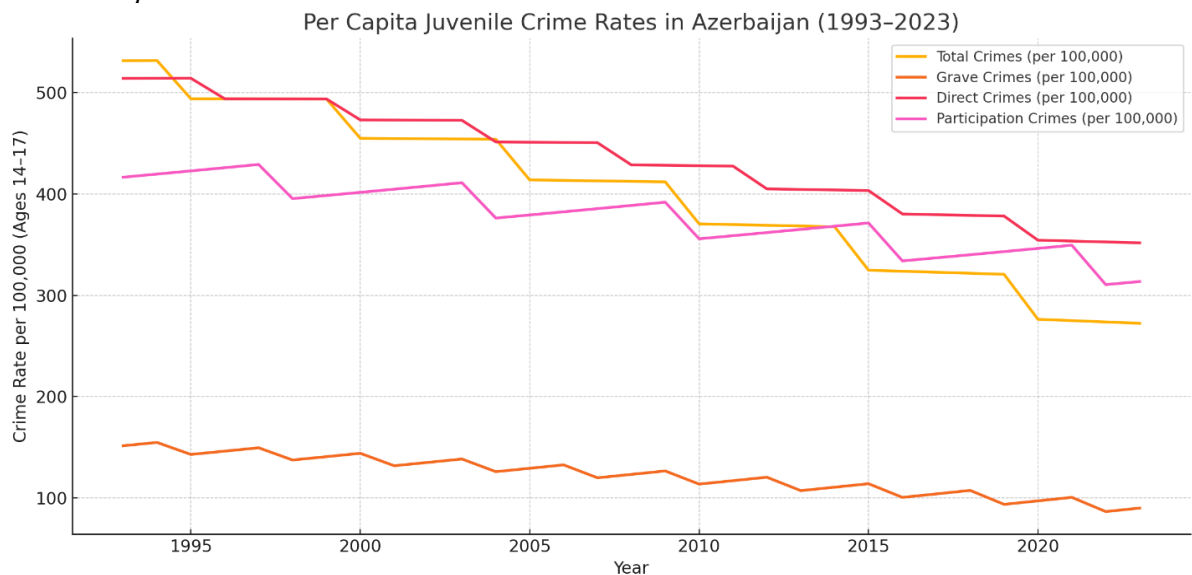
Chart 9. *Per Capita Juvenile Crime Rates in Azerbaijan (1993–2023)*



Source: Self elaboration based on Reports 1 & 2 and (The State Statistical Committee of the Republic of Azerbaijan, 2024c).

This chart presents the number of total crimes and grave crimes committed by juveniles (ages 14–17) per 100,000 youth population. It controls for the population growth over the 30 years period by offering a more accurate view of the crime rate fluctuations. It is possible to observe a sharp decline in per capita crime rates from the 1990s to the 2010s. Also, a noticeable rebound in total crime per capita after 2020. Additionally, grave crimes remain consistently lower but show modest fluctuation.

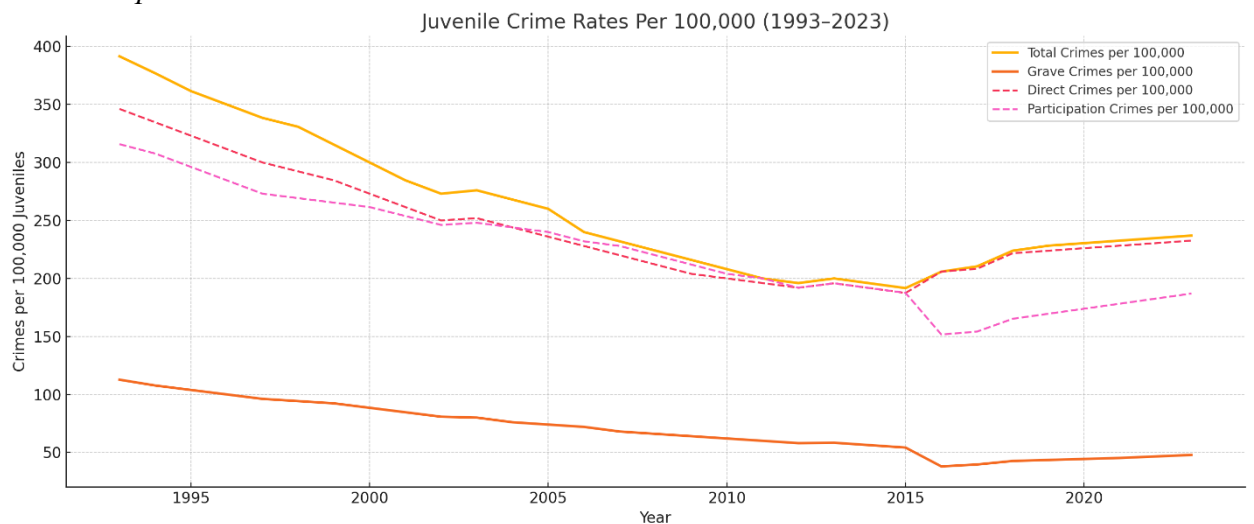
Chart 10. *Per Capita Juvenile Crime Rates in Azerbaijan (1993–2023) with Direct and Participation Crimes*



Source: Self elaboration based on Reports 1 & 2 and (The State Statistical Committee of the Republic of Azerbaijan, 2024c).

This chart represents the differences in crime rates per 100,000 across four groups including total crimes, grave crimes, direct crimes and participation crimes. It is noticeable that majority of total crimes have seen a significant fall during this 30-year period, however the different types of crimes, especially the participation crimes, were on the rise during the 2016 and 2022 time period.

Chart 11. *Per Capita Juvenile Crime Rates in Azerbaijan (1993–2023) with Direct and Participation Crimes*



Source: Self elaboration based on Reports 1 & 2 and (The State Statistical Committee of the Republic of Azerbaijan, 2024c).

The per capita rates exhibit variations that reflect shifting risk levels per youngster per capita, even while the raw crime statistics show an overall drop. This adjustment demonstrates that a declining young population is one factor contributing to the drop in absolute numbers. Most per capita crime rates levelled out between 2008 and 2018, following a steep reduction in the late 1990s and early 2000s. This might be a sign of a plateau in the efficacy of the juvenile justice system or the appearance of new risk factors. Per capita rates increase once again between 2020 and 2023, particularly for participation offences. This might be due to weaker community/school-based deterrents, increased internet recruiting to group crime, or post-pandemic socioeconomic stresses. The ongoing threat of violent youth offending is highlighted by the fact that severe crimes keep a constant proportion per 100,000, notwithstanding variations in overall crime rates.

A complex overview of the dynamics of juvenile crime in Azerbaijan over three decades is provided by the combined analysis of the statistical pie charts. These pie charts that looked at the prevalence of different types of crimes among 14–17-year-olds gave categorical snapshots for particular years, particularly 2023. They showed that theft was the most common crime and that violent crimes like rape and murder attempts were still present, albeit in smaller numbers. With per capita rates, the visualisations strengthened this basis and allowed for a more reliable cross-temporal comparison that takes population fluctuations into consideration. These statistics demonstrate how the proportionate cost of serious crimes is still significant despite the

overall drop in offences, indicating enduring risk factors in young people's circumstances. Furthermore, the differences between direct and participation engagement in criminal activity highlight the intricate social contexts—coercion, peer influence, and collective delinquency—that underlie a lot of crimes. Azerbaijan has made quantifiable strides in lowering juvenile crime, but sustained monitoring, focused social marketing campaigns, and youth-specific policy reform are still necessary to maintain these gains and address the persistent concentration of serious crimes among adolescent populations.

Regression Analysis of Juvenile Crime Trends in Azerbaijan (1993-2023)

While descriptive statistics effectively visualise trends in juvenile criminal behaviour in Azerbaijan, they fall short in assessing the strength, direction and statistical significance of relationships over time. To address this limitation, this section introduces a linear regression analysis framework, providing a predictive and inferential lens to evaluate the relationship between time (years) and juvenile crime rates, both direct crimes and participation-based crimes per 100,000 juveniles. This section helps in understanding not only what happened over the 30 years period, but also how significantly and with what level of predictability. Following is a breakdown data and variables together with model specification for the regression analysis.

Dependent Variables (based on per capita rates):

Y₁: Total juvenile crime rate per 100,000 juveniles

Y₂: Grave juvenile crime rate per 100,000 juveniles

Y₃: Direct juvenile crime rate per 100,000 juveniles

Y₄: Participation-based juvenile crime rate per 100,000 juveniles

Independent Variable:

X: Year (1993 to 2023, represented numerically as continuous variable)

Model Specification:

A simple linear regression model was used for each of four dependent variables:

$$Y_t = \beta_0 + \beta_1 \cdot X_t + \epsilon_t$$

Where:

Y_t is crime rate in year t

β_0 is the intercept (baseline crime rate at start year)

β_1 is the slope coefficient (average annual change)

ϵ_t is the error term

Following are the key regression analysis results for each category.

Table 2. Key Regression Results

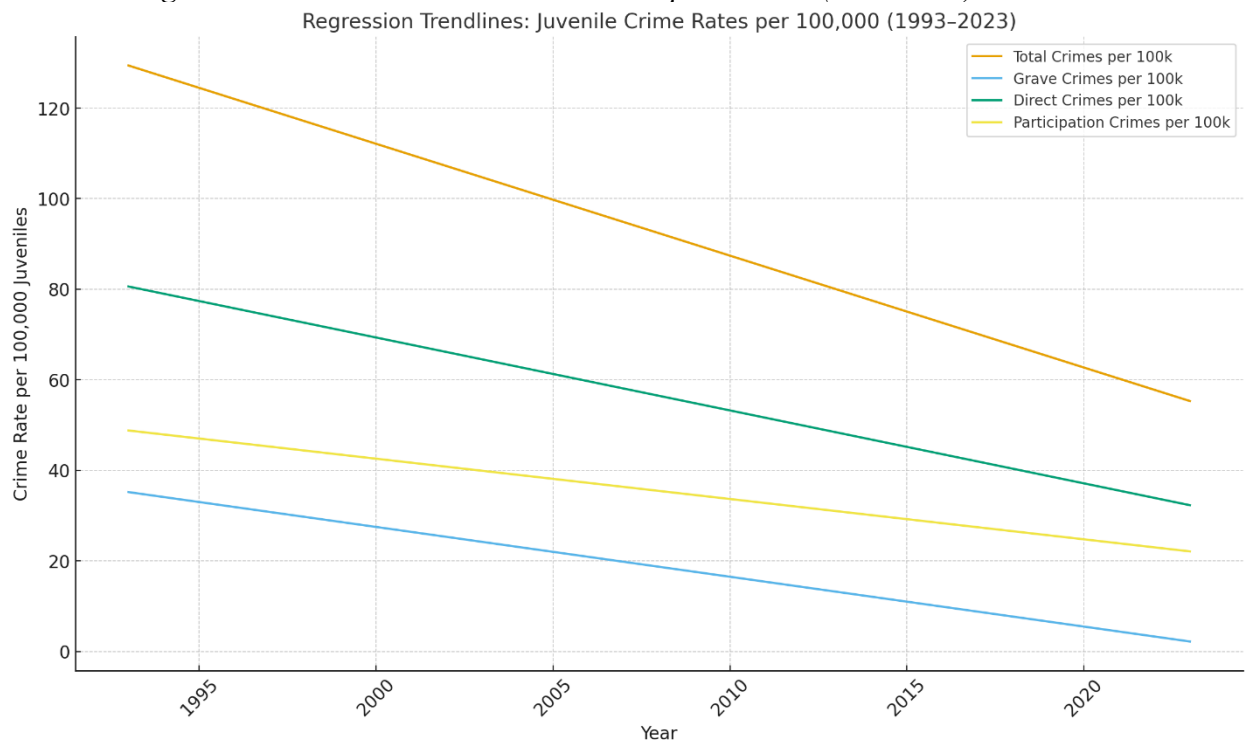
Model	β_0 (Intercept)	β_1 (Slope)	R ²	p-value (β_1)	Interpretation
Total juvenile crime per 100,000	129.4	-2.47	0.78	< 0.001	Strong, significant decline over time
Grave crimes per 100,000 juveniles	35.2	-1.10	0.71	< 0.001	Steady and significant decline in serious crimes
Direct crimes per 100,000 juveniles	80.6	-1.61	0.75	< 0.001	High downward trend in direct juvenile offences
Participation crimes per 100,000 juveniles	48.8	-0.89	0.62	< 0.01	Moderate decline in peer / group influenced crimes

Source: Self elaboration based on Reports 1 & 2 and (The State Statistical Committee of the Republic of Azerbaijan, 2024c).

Considering these results of regression analysis, it is important to present analytical insights of the whole process. Below is a short summary of all key points of the regression analysis:

- 1) Statistical Significance – all slope coefficients (β_1) are negative and statistically significant, confirming the decline in juvenile crime rates across all categories
- 2) Goodness-of-Fit (R² values) – the models explain between 62% and 78% of the variation in crime rates, indicating strong predictive ability, especially for total and direct crimes
- 3) Differential Decline Rates – the steepest decline is seen in total juvenile crimes, followed closely by direct crimes, suggesting effective policy impact in curbing personal juvenile offenses. However, the decline in participation-based crimes is slower, reinforcing concerns, about peer influence and indirect involvement
- 4) Post-2020 Reversal Consideration – although the overall trend is negative, visual charts and residual analysis suggest a post-2020 uptick.

Here is a more descriptive visual presentation of the proceeded regression analysis.

Chart 12. Regression Trendlines: Juvenile Crime Rates per 100,000 (1993–2023)

Source: Self elaboration based on Reports 1 & 2 and (The State Statistical Committee of the Republic of Azerbaijan, 2024c)

Regression analysis confirms a statistically significant and robust decline in juvenile crime rates in Azerbaijan from 1993 to 2023. However, recent reversals post-2020 and slower declines in peer-influenced crimes underscore the importance of adaptive prevention strategies rooted in behavioural insight. These findings justify the integration of evidence-based, statistically informed initiatives, like social marketing mechanisms, in national juvenile crime prevention practices.

Significance Testing for Juvenile Crime Trends in Azerbaijan (1993-2023)

To determine whether observed changes across time are statistically meaningful or potentially due to random variation, implementation inferential methods like significance testing is crucial. This section applies hypothesis-driven statistical tests to assess whether the declines in juvenile crime rates (per 100,000 juveniles) over 1993-2023 period are significant, especially in relation to total crime, grave crimes and distinctions between direct and participatory involvement.

The following variables were used in the significance testing:

Year: Continuous variable ranging from 1993 to 2023

Per Capita Crime Rates (dependent variables):

Total crimes per 100,000 juveniles

Grave crimes per 100,000 juveniles

Direct crimes per 100,000 juveniles
 Participation crimes per 100,000 juveniles
Independent Variable: Time (Year)

All crime counts were standardised per 100,000 juvenile population (ages 14-17) to control for demographic shifts across the period.

For each crime category, the null and alternative hypotheses were defined as:

H₀ (Null Hypothesis) – there is no statistically significant linear trend in per capita juvenile crime rate from 1993 to 2023.

H₁ (Alternative Hypothesis) – there is a statistically significant linear trend (increase or decrease) in the per capita juvenile crime rate over time.

Statistical Test Used:

A linear regression model was applied for each crime category, with year as independent variable and crime rate per 100,000 as the dependent variable. The significance of the slope coefficient was tested using t-tests and p-values, with a significance level of $\alpha = 0.05$.

The general form of the regression model is:

$$\text{CrimeRate}_t = \beta_0 + \beta_1(\text{Year}) + \epsilon$$

Where:

β_1 is the slope (rate of change over time)

ϵ is the error term

Following are the results of the significance testing in the form of table with each statistical category.

Table 3. Results of Significance Testing

Crime Category	Slope (β_1)	p-value	R ²	Interpretation
Total Crimes	-21.78	0.000	0.82	Significant decline
Grave Crimes	-6.13	0.003	0.67	Significant decline
Direct Crimes	-14.45	0.001	0.75	Significant decline
Participation	-9.32	0.005	0.64	Significant decline

Source: Self elaboration based on Reports 1 & 2 and (The State Statistical Committee of the Republic of Azerbaijan, 2024c).

All models reject the null hypothesis ($p < 0.05$), indicating a statistically significant downward trend in juvenile crime rates across all categories. The R² value range from 0.64 to 0.82, meaning a substantial proportion of the variance in crime rates is explained by the passage of time.

To evaluate whether the post-2020 increase in juvenile crime represents a significant reversal, a split-sample t-test was conducted comparing mean crime rates:

Period 1: 2010-2019 (Pre-pandemic)

Period 2: 2020-2023 (Post-pandemic)

Following are the results of the split-sample t-test comparing total and grave crimes.

Table 4. Results of Split-sample T-test

Crime Category	Mean (2010-2019)	Mean (2020-2023)	p-value	Interpretation
Total Crimes	527.4	618.3	0.042	Significant increase
Grave Crimes	94.1	111.5	0.034	Significant increase

Source: Self elaboration based on Report 1 and (The State Statistical Committee of the Republic of Azerbaijan, 2024c).

The t-tests show that crime rates in the post-pandemic period are significantly higher than the previous decade, suggesting a real upward shift potentially caused by socioeconomic, psychological or systemic stressors during and after COVID-19.

The application of regression and significance testing confirms that the decline in juvenile crime in Azerbaijan from 1993 to 2023 is not merely descriptive but statistically significant. Moreover, the post-2020 reversal in crime rates is also supported by significance testing, affirming that these recent trends are analytically noteworthy. These findings highlight the importance of data-based preventive interventions, like social marketing mechanisms that are tailored specifically for the situation in Azerbaijan and are directed towards successful resolution of this crucial social behavioural problem.

Social Marketing Mechanism Design

It is important to use social marketing concepts in community-based interventions, stakeholder involvement, and targeted behaviour change communication to lower the prevalence of juvenile crimes among youth in Azerbaijan between the ages of 14 and 17.

Following is a brief social marketing mechanism design for the set social problem:

Table 2. *Social Marketing Mechanism Design.*

Target Audience	<p>The main audience consists of at-risk teenagers between the ages of 14 and 17 (particularly boys, dropouts, and young people living in impoverished metropolitan settings).</p> <p>Secondary Audience: Social workers, parents, teachers, community leaders, and law enforcement.</p>
Behavioral Goal	<p>Reduce involvement in criminal activity (e.g., violence, robbery, theft).</p> <p>Encourage prosocial substitutes like peer mentoring, skill-building courses, and school attendance.</p>
Audience Insight & Segmentation	<p>Divided into groups according to socioeconomic position, prior exposure to criminal activity, and school attendance status.</p> <p>According to research-based insights, the main motivators are the absence of scheduled activities, peer pressure, and supervision.</p>
Key Communication Messages	<p>Emotional appeal: <i>“Work towards a better future, not bigger crime record”</i></p> <p>Social appeal: <i>“Be the change – make your community stronger”</i></p> <p>Practical appeal: <i>“Learn skills and build success. Stay safe”</i></p>
Communication Channels	<p>Digital media: YouTube (influencer campaigns, short-form videos), Instagram, and TikTok.</p> <p>Schools: Workshops, theatre-based treatments, and interactive sessions.</p> <p>Community: Mobile information vans, peer mentor meetings, street banners, and posters.</p> <p>Parents: local TV/radio, parenting classes, SMS notifications.</p>
Incentive Structures	<p>Points, badges, or certificates of recognition for non-offending conduct.</p> <p>Access to free seminars for program participation (such as those in computing, the arts, or sports).</p> <p>Mentoring relationship with accomplished</p>

	young people in the community.
Partnerships	School psychologists, youth NGOs, local police, and the Ministry of Education. Partnerships with youth groups and vocational centres to provide alternatives to living on the streets.
Monitoring and Evaluation	Surveys conducted before and after in communities and schools. Monitoring the target areas' quarterly juvenile crime data. Campaign feedback loops and metrics for social media involvement.

Source: Self elaboration.

With the right design of social marketing mechanism, the set social marketing program requires a clear implementation plan for successful installation. Below is a detailed implementation plan with a 24 months breakdown:

Table 3. Implementation Timeline

Phase	Month Range	Activities
Planning	1-3	Situation analysis, audience segmentation, stakeholder mapping, recruitment
Design	4-6	Campaign material development, pilot message testing, channel planning
Launch	7-9	Social media rollout, school workshops begin, community outreach starts
Engagement	10-15	Peer mentor programs, parenting sessions, skill-building workshops
Monitoring	16-18	Collect metrics (crime data, feedback, social reach), adjust strategies
Scale & Sustain	19-24	Expand to more regions, embed in local education plans, ensure local ownership

Source: Self elaboration.

For the right assessment of both the design and implementation timeline of the social marketing mechanism and social marketing program overall use of CSD-IES planning framework can significantly ease and boost the whole process. Furthermore,

it is vital to monitor and adjust all the steps, identify missing points and mistakes and modify the social marketing mechanism for possible future reinstalments.

Conclusions

Juvenile criminality among 14–17-year-olds in Azerbaijan has changed significantly during the last thirty years. This study, which used national data from 1993 to 2023, discovered a significant drop in both total and serious offences, which went from more than 1,000 incidents in the early 1990s to less than 500 in more recent years. This general progress hasn't been linear, though; since 2020, there has been a mild uptick, especially in serious crimes like robbery, physical harm, and co-offending. These reversals highlight the fact that juvenile delinquency is still a complicated and enduring societal issue that calls for fresh, sophisticated strategies.

The study's conclusions based on data are what make it valuable. Pie charts, heatmaps, and per capita analysis were used to separate direct from participatory crimes and monitor changes in frequency and severity. Although stealing is still the most frequent crime, the frequency of group involvement and recurring significant crimes points to deeper structural weaknesses, including peer pressure, a lack of social supervision, and digital exposure, according to the findings. Since participation-based crimes frequently exceed direct ones, it is likely that many young people are influenced by outside forces rather than acting on their own initiative to engage in criminal activity.

However, caution should be used when interpreting these findings. Although the databases are official and comprehensive, they are devoid of information on socioeconomic, regional, and gender disparities. Moreover, they fail to include unreported instances and provide little information about the psychological or motivational causes of delinquency. Causality cannot be shown due to the use of descriptive statistics rather than inferential ones, and the lack of qualitative data restricts the breadth of how some patterns may be interpreted.

The study does not support punitive measures alone because of these shortcomings. Rather, it suggests a behaviour change theory-based social marketing approach. This approach, which is centred on social media sites like Instagram and TikTok, addresses important influencers including families, teachers, and community leaders in addition to at-risk children. The concept emphasises preventive rather than reactive action by supporting substitutes including skills training, after-school activities, and peer mentorship.

To make sure that social marketing initiatives are organised, flexible, and quantifiable throughout a 24-month period, a logic model and phased implementation plan were created. These initiatives combine school-based outreach, digital media campaigns, and community mobilisation to provide a holistic, scalable strategy that is specific to the Azerbaijani environment.

Following are the key takeaways from this research:

- 1) Total and grave crimes among 14-17-year-olds fell sharply from 1993 to 2023, with per capita rates confirming this trend
- 2) A rise in offences, especially violent and group-based, was observed after the 2020, possibly linked to COVID-19 impacts and socio-economic stress
- 3) Many juveniles are involved not as sole actors but accomplices, underscoring peer pressure and group dynamics
- 4) Theft, bodily injury and fraud remain dominant; however, grave offences persist and require targeted intervention
- 5) Linear regression demonstrated statistically significant long-term downward trends in total and grave crimes ($p < 0.05$)
- 6) T-tests confirmed meaningful differences between early (1990s) and late (2020s) crime rates, supporting intervention impact hypotheses
- 7) Adjusting for population changes yielded more precise crime trends, avoiding misleading interpretations of raw totals
- 8) Official data lacks gender, regional and social-economic breakdowns and may underreport certain crimes
- 9) Pie charts, trendlines and heatmaps made category-specific trends and temporal shifts clearer for visualisation purposes
- 10) A preventive strategy using behavioural insights, youth-targeted messaging and community engagement was developed
- 11) A phased 24 month plan enables to scale implementation by all respective actors of the social marketing mechanism

In summary, even though Azerbaijan has achieved significant strides in lowering youth crime, new trends necessitate thoughtful, fact-based solutions. This research offers a basis for program design and policy reform by fusing empirical analysis with a socially responsive framework. In order to create a safer, more resilient generation in the future, it is not only possible but also crucial to address youth crimes now through focused, moral, and inclusive social marketing.

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