

Influence of Childhood Environmental Factors on Prisoners: An Ecological Systems Approach

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Abstract:

Childhood is a critical stage of development that shapes emotional stability, social behaviour, and long-term life outcomes. Adverse childhood experiences and environmental factors increase vulnerability to substance abuse and criminal behaviour. Guided by Bronfenbrenner's Ecological Systems Theory, this study examines the influence of childhood environmental factors on prisoners with a history of drug addiction, focusing on interactions across the Microsystem, Mesosystem, Exosystem, Macrosystem, and Chronosystem. A descriptive survey design with a qualitative component was employed. A sample of 57 prisoners from an open prison camp in Kandy was selected based on the central limit theorem. Data were collected using a self-administered structured questionnaire aligned with the five ecological systems and supplemented by semi-structured interviews. Ethical approval and informed consent were obtained prior to data collection.

Findings indicated that drug-related imprisonment occurred across all religious groups. Most respondents had low educational attainment, with the majority completing schooling only up to Grade 9, and were engaged in realistic jobs. The results demonstrate that imprisonment is the outcome of multiple interconnected childhood influences rather than a single factor. At the Microsystem level, family support, teachers, religious education, and access to medical care exerted positive influences, while peers and neighborhoods environments showed negative effects. Mesosystem interactions, particularly parent-teacher communication, were weak and inconsistent. Exosystem factors such as parents' work conditions, school administration, economic challenges, and healthcare access negatively affected well-being. At the Macrosystem level, cultural and social influences were uneven, with limited access to technology and weak community organizational support. Chronosystem analysis revealed that personal and family-level transitions had a stronger influence than broader national or environmental events. Statistical analysis confirmed significant differences among the ecological systems (Friedman $\chi^2 = 153.045$, $df = 4$, $p < .001$). The microsystem recorded the highest mean rank (4.49), indicating the strongest influence, while the Mesosystem recorded the lowest mean rank (1.60), and reflecting weak or uneven support. Pairwise comparison tests identified statistically significant differences in six out of ten system comparisons. These findings highlight the importance of strengthening protective childhood environments across all ecological levels to reduce substance abuse and criminal involvement.

Keywords: Childhood environment, ecological systems theory

Introduction:

Childhood is a critical period in human development, laying the foundation for personality formation, social behavior, and emotional well-being. Experiences and environmental influences during this stage have long-term consequences for an individual's adjustment and life outcomes. Beyond the family environment, broader ecological factors - such as the legal system, neighborhood conditions, cultural norms, and institutional practices also play a significant role in shaping developmental trajectories.

Prisoners, as well as all individuals, have childhood histories that often exert a profound influence on their physical and mental health, thoughts, emotions, and behaviors. Two key developmental factors are particularly relevant when examining their mental well-being: the quality of early attachment relationships and exposure to Adverse Childhood Experiences (ACEs). Research consistently demonstrates that early adversity is highly prevalent among offenders. Baglivio and Epps (2016) found that incarcerated populations disproportionately report childhood abuse, neglect, poverty, and family instability. These developmental risks significantly predict later incarceration as well as poor adjustment within correctional settings. Similarly, Van der Kolk (2017) argues that disrupted or insecure attachment - stemming from neglect, inconsistent caregiving, or parental absence - produces long-term impairments in emotional regulation and social behavior, patterns that are strongly represented within prisoner populations. Supporting this evidence, Astridge et al. (2023), through a systematic review and meta-analysis, confirmed elevated prevalence rates of ACEs among justice-involved youth and demonstrated strong pooled effect sizes linking childhood adversity with later criminal justice involvement.

Although substantial global research has examined how childhood environments influence later offending, Sri Lanka still has a relatively limited body of scholarly work in this area. Yet,

the Sri Lankan context shows a notable rise in the number and diversity of individuals entering the prison system. According to the Annual Report of Prison Statistics Sri Lanka (2024), direct admissions of convicted persons, including narcotic drug offenders, condemned prisoners, life-sentenced individuals, youthful offenders, and other convicted categories have steadily increased. Narcotic drug offenders constitute the largest group, with admissions rising dramatically from 9,344 in 2021 to 29,192 in 2024. This surge has contributed to severe overcrowding within existing prison facilities.

Against this backdrop, the present study seeks to investigate how childhood and adolescent experiences contribute to pathways into incarceration, particularly in relation to drug addiction and drug-related activities using Bronfenbrenner's Ecological Systems Theory as the guiding framework. This approach enables a holistic examination of how individual, familial, community, and societal factors interact over time to shape vulnerability to offending and subsequent imprisonment.

Review of Literature:

This literature review synthesizes theoretical and empirical research relevant to the study. It is organized into two broad strands: (1) theoretical foundations including Bronfenbrenner's Ecological Systems Theory and its application (2) empirical findings on global evidence on childhood risk and protective factors, and the organizational and social realities of Sri Lankan prisons. Across both strands, emphasis is given to mechanisms that link childhood environments to later offending and to gaps in scholarship that motivate the present study.

1. Theoretical Foundations:

Bronfenbrenner's Ecological Systems Theory:

Bronfenbrenner's Ecological Systems Theory provides a multi-layered framework for understanding how development is shaped by interactions between the individual and progressively larger social contexts.

The theory's concentric systems: microsystem, mesosystem, exosystem, macrosystem, and chronosystem offer a useful heuristic for mapping pathways from childhood environments to later maladapted behavior: Later presented the theory with new developments which Bronfenbrenner expanded his theory into the bioecological model, highlighting those proximal processes. (Guy-Evans, 2025)

- **Microsystem:** Immediate settings (family, school, peer group). Research highlights parenting quality, attachment security, exposure to domestic violence and early schooling experiences as proximal predictors of behavioral regulation, social competence, and risk-taking. Disrupted attachment and inconsistent parenting are repeatedly linked to emotion-regulation difficulties and externalizing behaviors that increase risk for later offending. (Flynn & Mathias, 2023)
- **Mesosystem:** Interactions among microsystems (e.g., parent–teacher relations, family–peer interactions). Dysfunctional mesosystem linkages, such as poor communication between caregivers and schools can reinforce disengagement, academic failure, and social isolation, which are known risk pathways to delinquency.
- **Exosystem:** Contexts that indirectly affect the child (parental workplace, neighbourhood services, local criminal justice practices). Economic strain, parental unemployment, and community disorganisation can increase stressors on families and diminish access to supportive resources.
- **Macrosystem:** Cultural values, policy environments, and wider socioeconomic structures. Societal norms regarding drugs, punishment, and social stratification shape both the availability of opportunities and the legal responses to certain behaviours (e.g., how drug offences are policed and punished).

- **Chronosystem:** Time and historical change, including life transitions and shifting social policies. Longitudinal perspectives emphasise how cumulative exposures (e.g., repeated adversity) and historical events (economic downturns, policy reforms) alter risk trajectories.

Applying this model to offending directs attention away from single causes and toward interacting, multilevel processes that shape vulnerability and resilience.

Empirical Evidence:

Global Findings on Childhood Risk and Offending

Considering the global findings, a large scale of studies has been investigated in different pathways of cross-sectional, cohort, and meta-analytic - documents elevated prevalence of childhood adversity among justice-involved populations. Empirical evidence indicates high rates of abuse, neglect, and household dysfunction among incarcerated adults and youth (Baglivio & Epps, 2016; DeLisi et al., 2017; Messina & Grella, 2006; Astridge et al., 2023). Furthermore, protective factors such as stable caregiver relationships, positive school engagement, and access to vocational training significantly mitigate risk and predict better psychosocial adjustment and reduced offending (Werner & Smith, 1992; Masten, 2014). Also research studies across disciplines consistently highlights childhood as a formative period during which environmental influences shape emotional regulation, social behavior, and long-term life trajectories. Empirical evidence demonstrates that adverse childhood experiences (ACEs), including family instability, poor parental supervision, exposure to violence, and limited educational support, are strongly associated with later substance abuse, criminal behaviour, and recidivism (Felitti et al., 1998; Baglivio & Epps, 2016; Zhang et al., 2020). These findings support ecological perspectives that emphasize the cumulative and interactive nature of environmental risks rather than single causal factors.

Microsystem Influences:

At the microsystem level, family relationships, peer interactions, school experiences, and neighbourhood contexts have been identified as primary determinants of childhood development. Studies from diverse cultural settings indicate that weak family attachment, parental substance use, and exposure to deviant peers significantly increase the likelihood of drug use and delinquency (Hawkins et al., 2008; Van der Kolk, 2017). Conversely, positive relationships with caregivers, supportive teachers, and engagement in religious or moral education serve as protective factors that promote resilience and reduce antisocial behavior. (Resnick et al., 1997; Smith, 2003).

Mesosystem Interactions:

The mesosystem reflects the quality of interactions between immediate environments, such as parent–teacher communication and family–community relationships. Empirical studies show that consistent parental involvement in schooling and strong school–family partnerships are associated with improved academic engagement and reduced behavioral problems (Wang & Degol, 2016). However, research among marginalized and justice-involved populations indicates that these connections are often weak or disrupted, limiting their protective influence

Exosystem Factors:

Exosystem influences include parental employment conditions, school administration practices, access to healthcare, and broader economic circumstances. International studies reveal that parental job insecurity, poverty, and inadequate social services contribute to chronic stress within families, increasing children’s vulnerability to substance use and later offending (Conger et al., 2010; Farrington & Ttofi, 2015). Limited access to healthcare and inconsistent institutional support further exacerbate developmental risks, particularly among low-income and urban populations.

Macrosystem Context:

At the macrosystem level, cultural norms, social inequalities, gender roles, and policy environments shape developmental opportunities. Research across global contexts indicates that structural inequalities, limited access to technology, and weak community organizations disproportionately affect disadvantaged children, restricting educational and social mobility (UNODC, 2018). While cultural and religious values can offer moral guidance, their protective impact is not universal and often depends on supportive conditions within lower ecological systems.

Chronosystem Influences:

The chronosystem captures life transitions and socio-historical changes over time. Longitudinal studies show that family disruptions, economic crises, and critical personal transitions—such as school changes or migration—have lasting effects on identity formation and behavioural outcomes (Elder, 1998; Masten & Cicchetti, 2016). Evidence suggests that personal and family-level transitions exert a stronger influence on substance use trajectories than broader national or environmental events.

Overall, global empirical evidence supports Bronfenbrenner’s assertion that childhood development is shaped by dynamic interactions across ecological systems. Studies consistently demonstrate that drug addiction and criminal behavior emerge from multiple interconnected environmental influences

Sri Lankan Context: Prison Population, Causes and Institutional Responses:

Research studies and official reports on Sri Lankan prisons point to several salient themes that are pertinent to the present study. A peer-reviewed study on prison rehabilitation conducted at Mahara Prison highlights that increasing inmate populations impair access to vocational sectors, reduce referrals to rehabilitation programs, and worsen health outcomes. Further, Sri Lanka utilizes varied custodial arrangements such as

closed prisons, work camps, and open prison camps aimed at ensuring differential levels of security and rehabilitation. Programmatic efforts include institutional treatment and the categorization of prisoners by offender profiles; however, capacity limitations and resource constraints significantly restrict service reach (Anuradha, 2023).

Urbanization, underemployment, and limited vocational opportunities are commonly cited as socio-structural contributors to offending and to the recruitment of marginalized groups into criminal activity (National Audit Office [NAO], 2023). Recent Sri Lankan research has largely focused on institutional capacity, inmate health, and rehabilitation processes (Wickramatilake et al., 2023); however, these studies have not examined prisoners' childhood backgrounds, attachment patterns, or early adverse experiences. Compared with the global literature, there remains a relatively limited body of empirical work that systematically examines how childhood ecological conditions map onto offending trajectories within the Sri Lankan socio-cultural and policy context.

Methodology:

The study was conducted using a descriptive survey design, in which a self-administered Likert-scale questionnaire was used to collect data from prisoners. Based on the central limit theorem, a sample of 57 prisoners was selected from an open prison camp located in Kandy.

Data collection was facilitated by 57 interviewers who were students enrolled in the Postgraduate Diploma in Counselling programme. They assisted in administering the questionnaires to ensure clarity and accuracy of responses. Ethical approval for the study was obtained from the Ethical Review Committee of the Faculty of Education, along with formal permission from the Prison Headquarters. Informed consent was obtained from all participating prisoners prior to data collection.

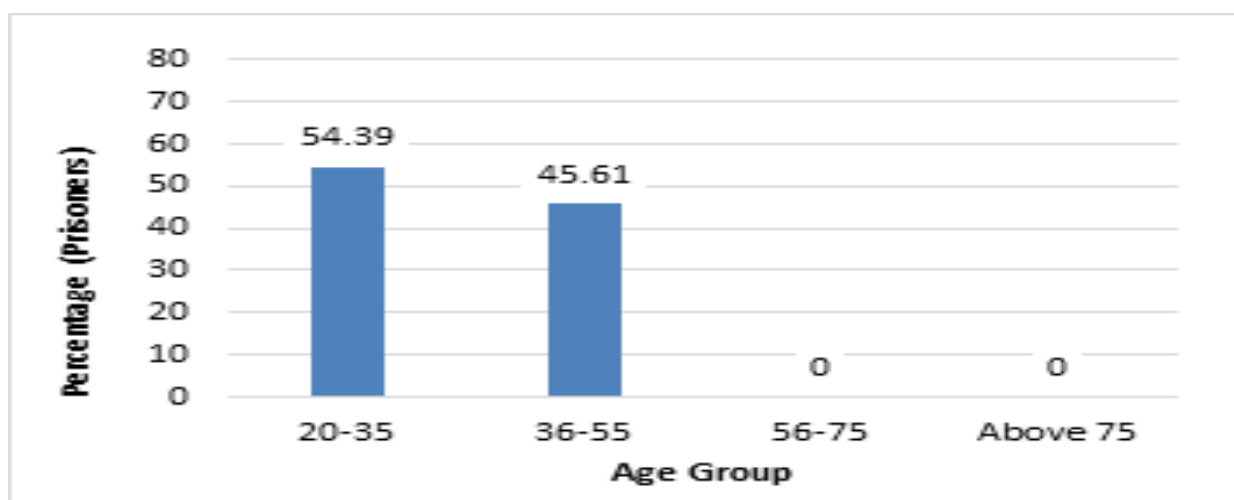
In addition to the questionnaire survey, semi-structured interviews were conducted with the prisoners to address gaps encountered during questionnaire completion. All participating prisoners had been arrested on narcotic drug-related charges, and all were under 55 years of age.

Findings:

This study intended to explore the geographical information of prisoners and examine how these factors affected their development from childhood to adolescence, based on the multi-layered framework of Bronfenbrenner's Ecological Systems Theory. The geographical analysis included age, religion, district, marital status, education level, living arrangements, and occupational type of drug-addicted persons.

Age-wise patterns of drug addiction among prisoners.

Figure 1 Age-wise Patterns of Drug Addiction among Prisoners



The Figure 1 shows that drug addiction among prisoners is most prevalent in the 20–35 age group (54.39%), followed by the 36–55 age group (45.61%). No cases were reported among

prisoners aged 56 years and above, indicating that drug addiction is mainly concentrated among younger and middle-aged individuals.

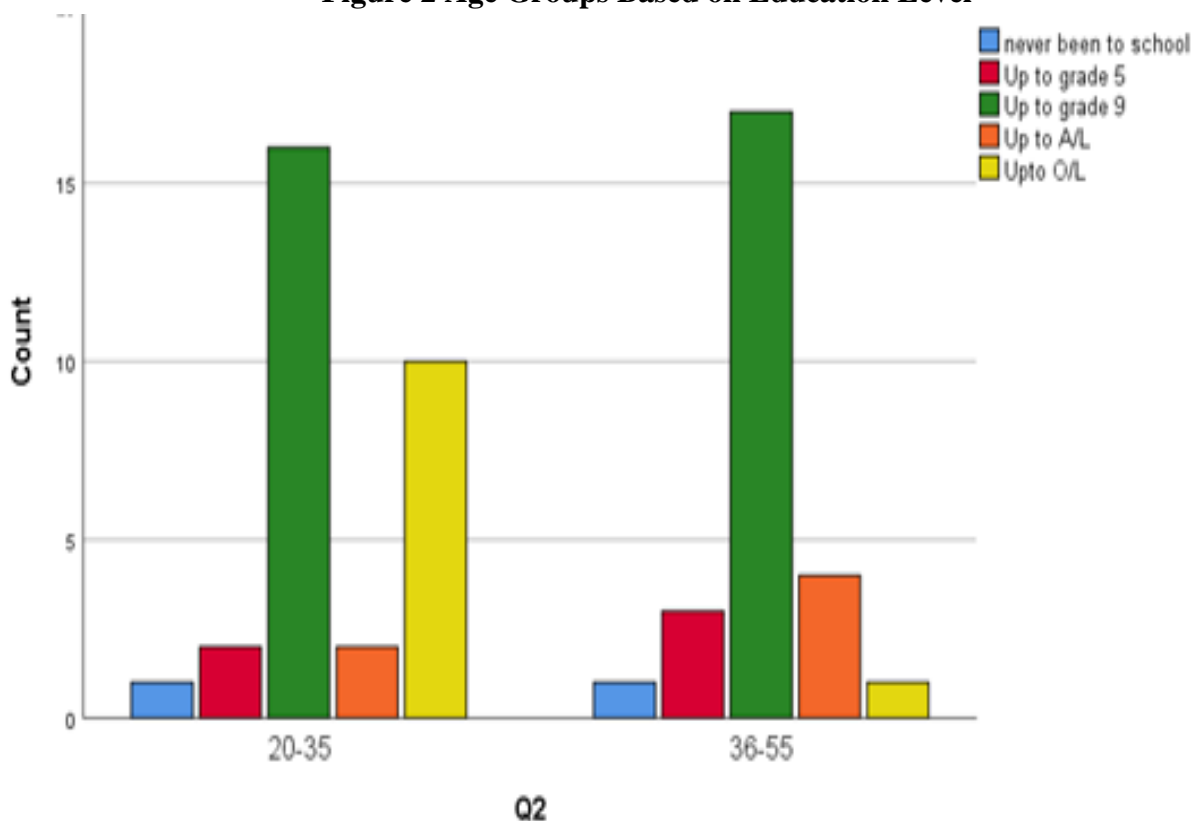
Table 1 Religion-wise distribution of drug-addicted prisoners

Religion	Percent	Valid Percent
Buddhist	27	47.4
Hindu	5	8.8
Christian	8	14.0
Islam	17	29.8
Total	57	100.0

The findings demonstrate a religiously diverse sample, with Buddhism as the dominant religion (47.4%) followed by Islam (29.8%), while Hindu representation is comparatively low.

Age groups based on education level

Figure 2 Age Groups Based on Education Level



According to the figure two, most prisoners in both age groups have a basic education, with Grade 9 being the most common highest level. Completion of higher education (O/L and A/L) is

limited, with older prisoners slightly more likely to have reached A/L. The number of prisoners who never attended school is very low in both groups, indicating that most have some formal

education. There is a shift in education trends: younger prisoners tend to have completed O/L more frequently, while older prisoners show slightly higher A/L completion.

District wise percentage of prisoners:

The table two presents the district-wise distribution of 57 respondents

Table 2 District wise Percentage of Prisoners

District	Frequency	Percentage (%)
Colombo	43	75.4
Gampaha	10	17.5
Anuradhapura	01	1.8
Ratnapura	01	1.8
Trincomalee	01	1.8
Batticaloa	01	1.8
Total	57	100.0

According to the data, a significant majority of the respondents are from Colombo District, which accounts for 43 respondents (75.4%). This indicates that more than three-quarters of the sample is concentrated in Colombo. The second highest representation is from Gampaha District, with 10 respondents (17.5%), showing a moderate

contribution to the total sample. In contrast, the districts of Anuradhapura, Ratnapura, Trincomalee, and Batticaloa each contribute only one respondent (1.8%), indicating very low representation from these regions.

Marital state of drug addicted

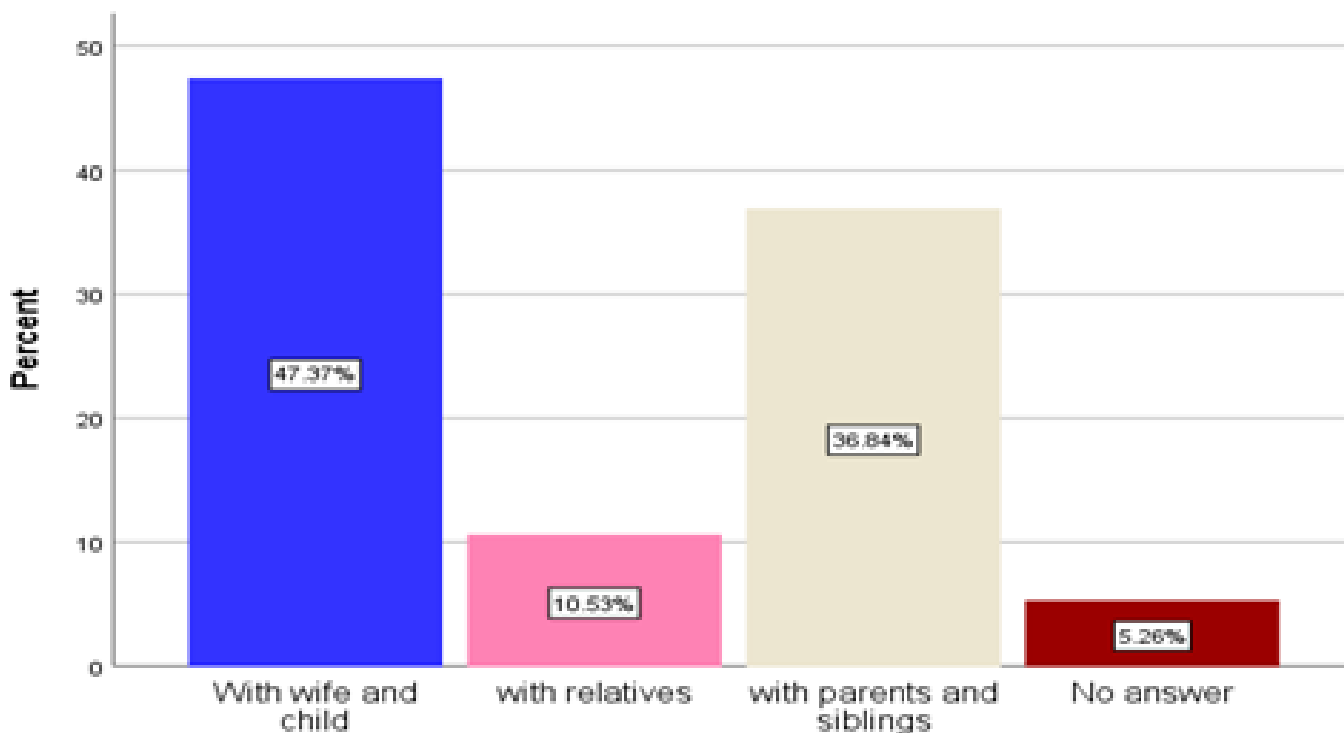
Table 3 Marital State of Drug Addicted

	Frequency	Percentage (%)
Married	36	63.2
Unmarried	21	36.8
Total	57	100.0

According to the data, the majority of the respondents are married, with 36 individuals representing 63.2% of the total sample. This indicates that nearly two-thirds of the respondents are married.

Residential and Family Living Status of the prisoners:

Figure 3 Residential and Family Living Status of the Prisoners



According to the data, the largest group of respondents, 27 individuals (47.4%), were living with their wife and child, indicating that nearly half of the sample had primary family responsibilities. A considerable proportion, 21 respondents (36.8%), were living with their parents and siblings, reflecting extended or

parental family support structures. A smaller group, 6 respondents (10.5%), were living with relatives, showing alternative family arrangements. Only 3 respondents (5.3%) did not provide an answer regarding their living arrangements.

Table 4 Occupational Categories of Drug-addicted Prisoners

	Frequency	Percentage (%)
Realistic	43	75.4
Entrepreneurship	11	19.3
Traditional	02	3.5
No response	01	1.8
Total	57	100.0

The findings suggest that most drug-addicted persons in the sample were engaged in realistic and entrepreneurial job types, while participation in traditional occupations was very limited. This occupational pattern may reflect the socio-economic background and skill levels of the respondents.

Prisoners Responses for the Micro System:

The questionnaire consisted of ten statements, including 9 positive statements and one negative statement. It mainly collected responses related to five key areas within the microsystem, namely: family, siblings extended family members (Question number 1, 3, 4), peers (Question

number 2, 6, and 7), neighbors (Question number 9), and school/ religious school teachers (Question number 5, 8), medical facilities (Question number 10) which directly influence childhood development. Given 10 statements as follows related to Micro system.

Microsystem: Immediate Environment:

- 1.1 I was blessed with love and support from my parents/guardians during my childhood.
- 1.2 My friendships helped me develop self-confidence.
- 1.3 I had a positive relationship with my siblings.

- 1.4 I did not have a loving relationship with my grandparents.
- 1.5 My teachers encouraged me to study.
- 1.6 My friends encouraged me to study.
- 1.7 I had friends who encouraged me to engage in positive behaviors.
- 1.8 Dhamma education (religious education) guided me in a positive direction.
- 1.9 My neighbors influenced my development.
- 1.10 I was able to receive medical care promptly when I was sick.

Figure 4 Influence of the Micro System for the Development of Childhood

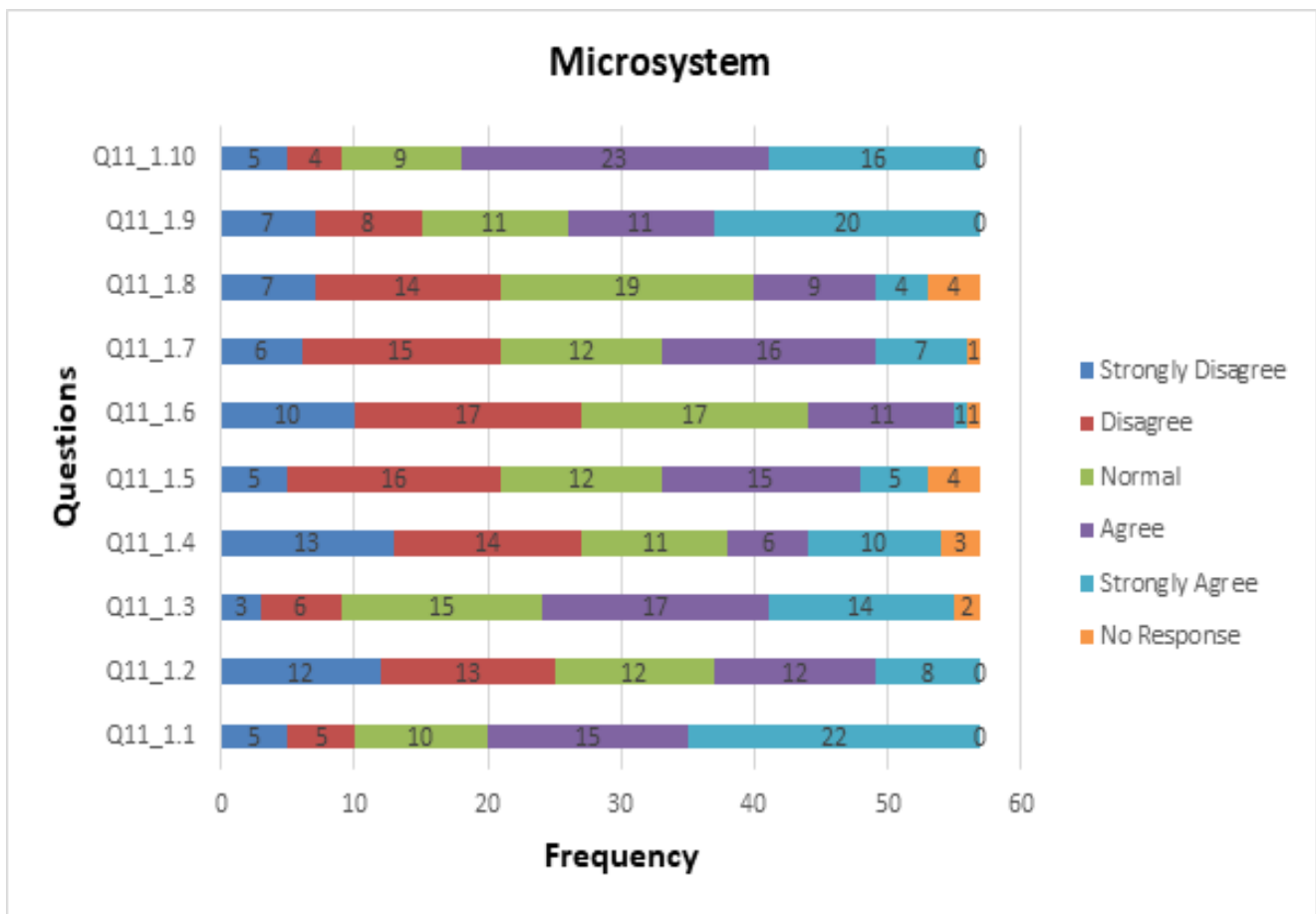


Figure 4 illustrates that the majority of respondents agreed or strongly agreed that they received consistent love and support from parents or guardians, highlighting family support as a strong protective factor during childhood, despite a small proportion reporting inadequate parental care. Relationships with siblings showed mixed

responses but generally leaned toward neutral to positive, indicating variability in sibling dynamics. Regarding grandparents, most respondents disagreed with the negatively worded statement, suggesting that many experienced loving relationships, although some reported emotional distance or lack of support.

Peer relationships emerged as a significant microsystem influence, with most respondents acknowledging that friendships contributed positively to self-confidence and encouraged positive behaviors. However, classmates' influence on academic motivation was moderate and inconsistent compared to the stronger motivational role played by teachers. Dhamma education received notably positive responses, emphasizing the importance of religious and moral guidance in shaping values and behavior. In contrast, neighbors exerted a limited and inconsistent influence. Additionally, most respondents reported timely access to medical care during illness, indicating generally adequate healthcare support within their immediate environment, despite challenges faced by a minority.

Prisoners Responses for the Mesosystem:

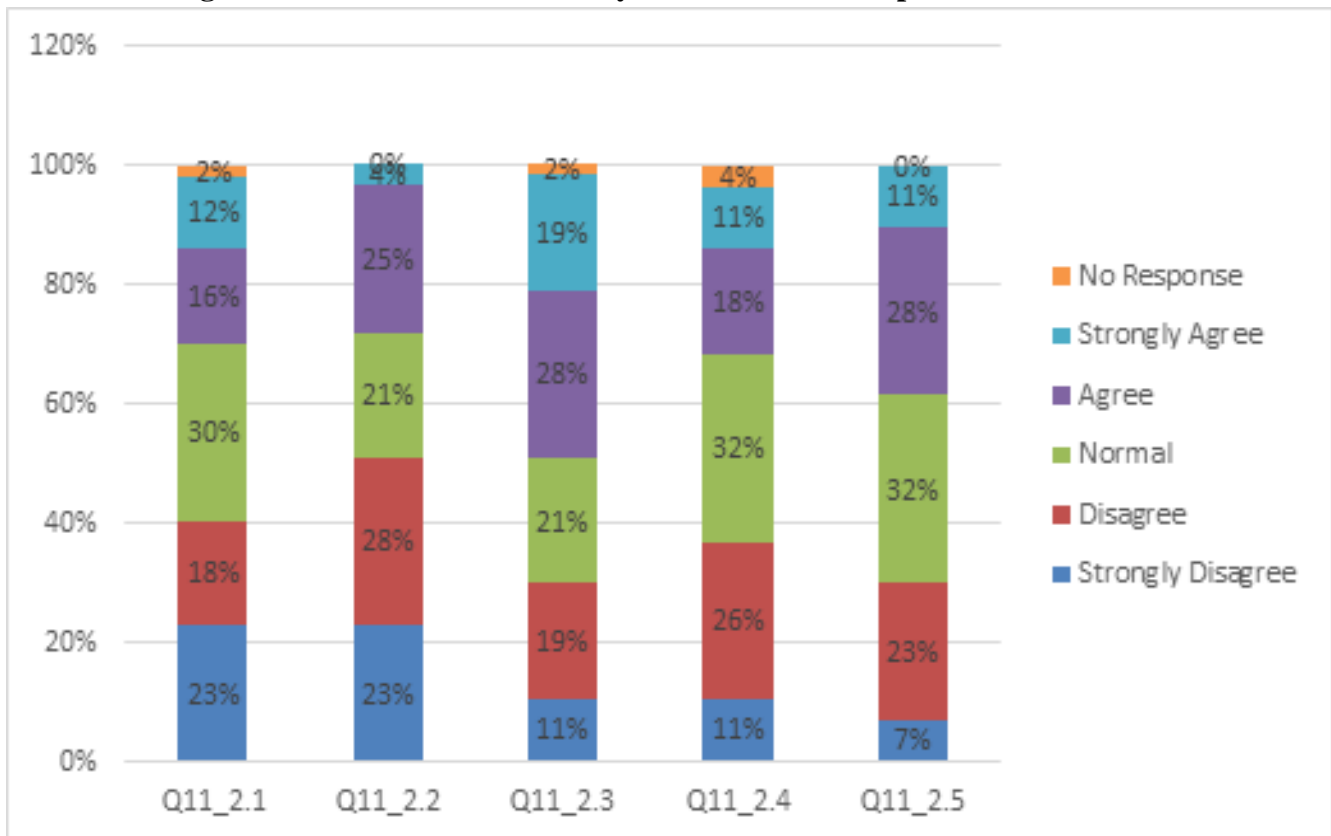
The following diagram indicates of key Mesosystem interactions, highlighting how connections between Parent-teacher communication, Family and friends' relationships, Family – community interaction, Family –

healthcare interaction, Family involvement in religious activities. The questionnaire consisted of five statements which all were positive statements as follows.

Mesosystem: Interconnections:

- 2.1 Communication between my parents and teachers helped me perform well in school. (My parents often visited my school to monitor my progress.)
- 2.2 The relationships I had with my family and friends helped me develop a positive attitude.
- 2.3 The way my family interacted with the community and participated in community activities helped my social development. (For example, helping with charity work and funerals.)
- 2.4 Interactions between my family and healthcare providers helped me develop good health awareness. (For example, having a family doctor.)
- 2.5 My family's involvement in religious activities helped shape my behavior in a positive way.

Figure 5 Influence of the Mesosystem for the Development of Childhood



According to Figure 5, responses on parent–teacher communication show a mixed pattern. Many respondents disagreed or strongly disagreed that communication between parents and teachers supported their school performance. Although some respondents agreed, a large number of neutral and negative responses indicate that parental involvement with schools was inconsistent and had limited positive impact for many participants. Regarding family and friends’ relationships, many respondents agreed that positive relationships helped them develop a positive attitude. However, the presence of neutral and disagreement responses suggests that such supportive relationships were not experienced by all participants. Responses on family–community interaction were moderately positive, with many agreeing that family involvement in community activities supported development. Nevertheless, a noticeable number of neutral and negative responses indicate wide variation in community engagement among families. Family–healthcare interaction also showed mixed responses. While some participants agreed that regular contact with healthcare providers supported good health, many expressed neutrality or disagreement, suggesting unequal access to consistent healthcare services. Family involvement in religious activities received the most positive responses among all mesosystem factors. A higher level of agreement highlights the strong role of religious engagement in shaping attitudes and values through family–religious institution relationships.

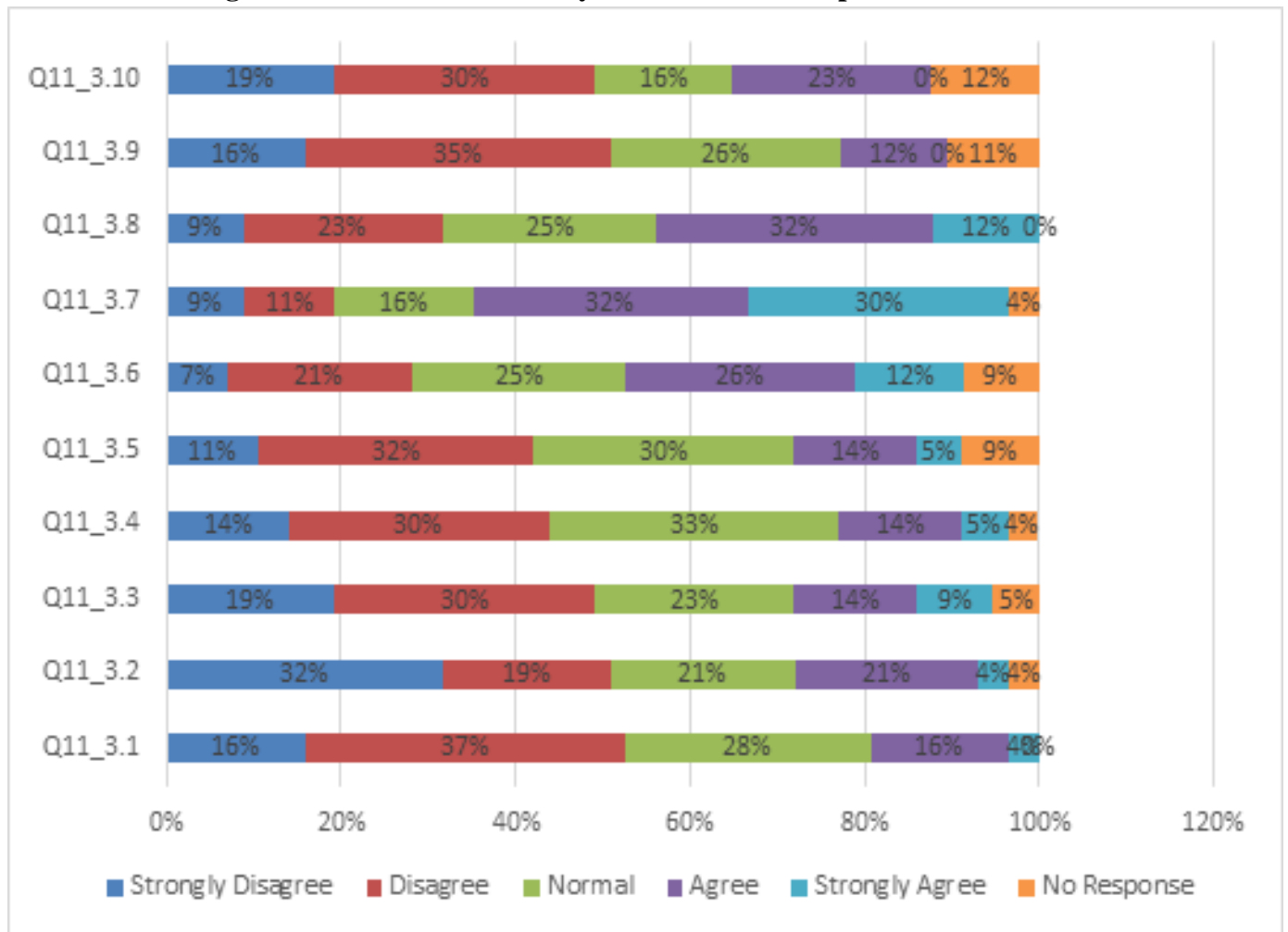
Prisoners Responses for the Exosystem:

Figure 6 illustrates the influence of the exosystem on childhood development. Ten statements were assessed using a five-point Likert scale, consistent with the previous sections of the questionnaire. Among these items, nine statements were positively worded, while one statement (Item 3.7) was negatively worded.

Ecosystem: Indirect influence (Indirect environments affecting childhood)

- 3.1 My parents’ workplaces and employment conditions positively influenced my well-being.
- 3.2 Community organizations (such as youth clubs, religious groups, and NGOs) influenced my development.
- 3.3 School administration decisions influenced the quality of my education (e.g., regular school attendance and proper wearing of uniforms).
- 3.4 Media (television, radio, and the internet) influenced the way I thought and behaved during my childhood.
- 3.5 State laws and policies positively influenced my education (e.g., ensuring equal educational opportunities for all).
- 3.6 The availability of public transportation facilities facilitated my access to school and other activities.
- 3.7 The economic situation in my country negatively affected my family’s lifestyle (e.g., rising prices of goods).
- 3.8 State laws and policies positively influenced my personality development (e.g., awareness of state laws before engaging in drug use).
- 3.9 Local government policies positively influenced my safety (e.g., state policies on child protection).
- 3.10 Social services or welfare programs (where available) helped to build stability in my family.

Figure 6 Influence of the Exosystem for the Development of Childhood



The findings related to exosystem factors show mixed perceptions among respondents regarding external influences on their development. Parents’ workplaces and employment conditions (3.1) received more disagreement than agreement, suggesting that many respondents felt their parents’ work situations did not positively support their well-being. Community organizations (3.2) also showed divided responses, with similar levels of agreement, neutrality, and disagreement, indicating that their influence varied across individuals. Responses to school administration decisions (3.3) and media influence (3.4) were largely neutral or negative, suggesting that these factors did not consistently support positive educational or behavioral outcomes. State laws and policies related to education (3.5) and personality development (3.8) showed moderate agreement, but a substantial proportion of neutral and negative responses indicates limited perceived impact among many respondents. Public

transportation facilities (3.6) received mixed responses, suggesting unequal access that affected participation in school and other activities. The economic situation of the country (3.7) received the highest level of agreement, indicating that most respondents felt economic conditions negatively affected their family lifestyle. Local government policies on safety (3.9) and social welfare services (3.10) showed moderate agreement alongside notable neutrality and disagreement, reflecting inconsistent benefits across families. Overall, the results suggest that exosystem influences affected respondents unevenly, with economic conditions showing the strongest impact, while institutional and policy-level supports were perceived as limited or inconsistent.

Prisoners Responses for the Macrosystem:

Figure 7 illustrates the influence of the Macrosystem on childhood development. Six

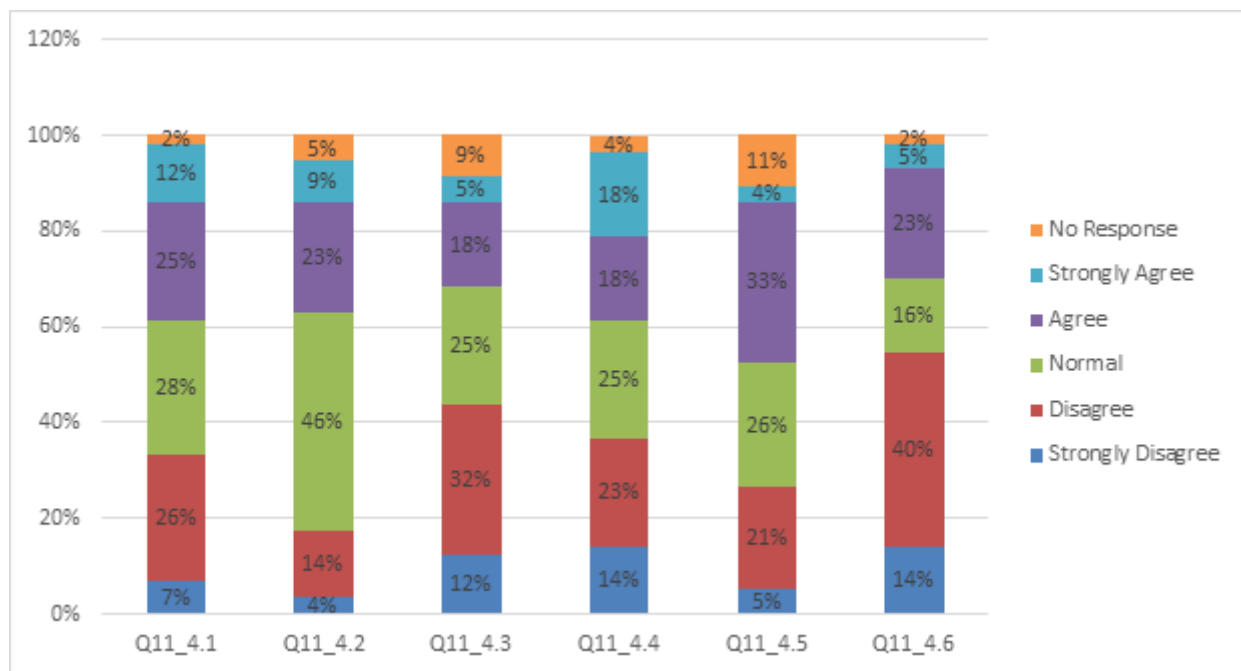
positive statements were assessed using a five-point Likert scale, consistent with the previous sections of the questionnaire.

Macro system: Cultural and Social Context (Societal and cultural influences on childhood)

- 4.1 The religious beliefs held in my family strongly influenced my childhood development.
- 4.2 The availability of public health facilities influenced my overall well-being during childhood.
- 4.3 Access to technology, or the lack of it, shaped my childhood learning experiences and social interactions.

- 4.4 The behavior and attitudes of people around me influenced my respect for the environment and public property (e.g., valuing nature and resources, avoiding the destruction of public property, and preventing environmental pollution).
- 4.5 Gender roles and societal expectations influenced the way I was shaped during childhood.
- 4.6 Community organizations, such as youth clubs, religious groups, and NGOs, influenced my development.

Figure 7 Influence of the Macrosystem for the Development of Childhood



The findings related to macrosystem factors show varied influences on respondents' childhood development. Family religious beliefs (4.1) received relatively high levels of agreement, indicating that religion played an important role in shaping childhood development for many respondents. Responses to the availability of public health facilities (4.2) were largely neutral, suggesting that access to healthcare had an inconsistent influence on overall well-being during childhood. Access to technology (4.3) showed higher levels of disagreement, indicating

that limited access to technology negatively affected learning experiences and social interactions for many respondents. The behavior and attitudes of people in the surrounding environment (4.4) received mixed responses, with moderate agreement, suggesting a varied influence on respect for the environment and public property. Gender roles and societal expectations (4.5) showed relatively high agreement, highlighting their strong influence on shaping childhood experiences. Community organizations (4.6) received more disagreement

than agreement, indicating that such organizations did not play a strong developmental role for many respondents. Overall, the results suggest that cultural values and social norms had a stronger influence on development than institutional supports such as healthcare, technology, and community organizations.

Prisoners Responses for the Chronosystem

Figure 8 illustrates the influence of the Macrosystem on childhood development. Six negative statements were assessed using a five-point Likert scale, consistent with the previous sections of the questionnaire.

Chronosystem: Influence of Time and life transitions (Changes and transitions over time)

6.1 Major national or global events (such as wars, disasters, or epidemics) that occurred

during my childhood influenced my development.

6.2 Rapid technological changes (e.g., the introduction of the Internet and mobile phones) influenced my learning and relationships.

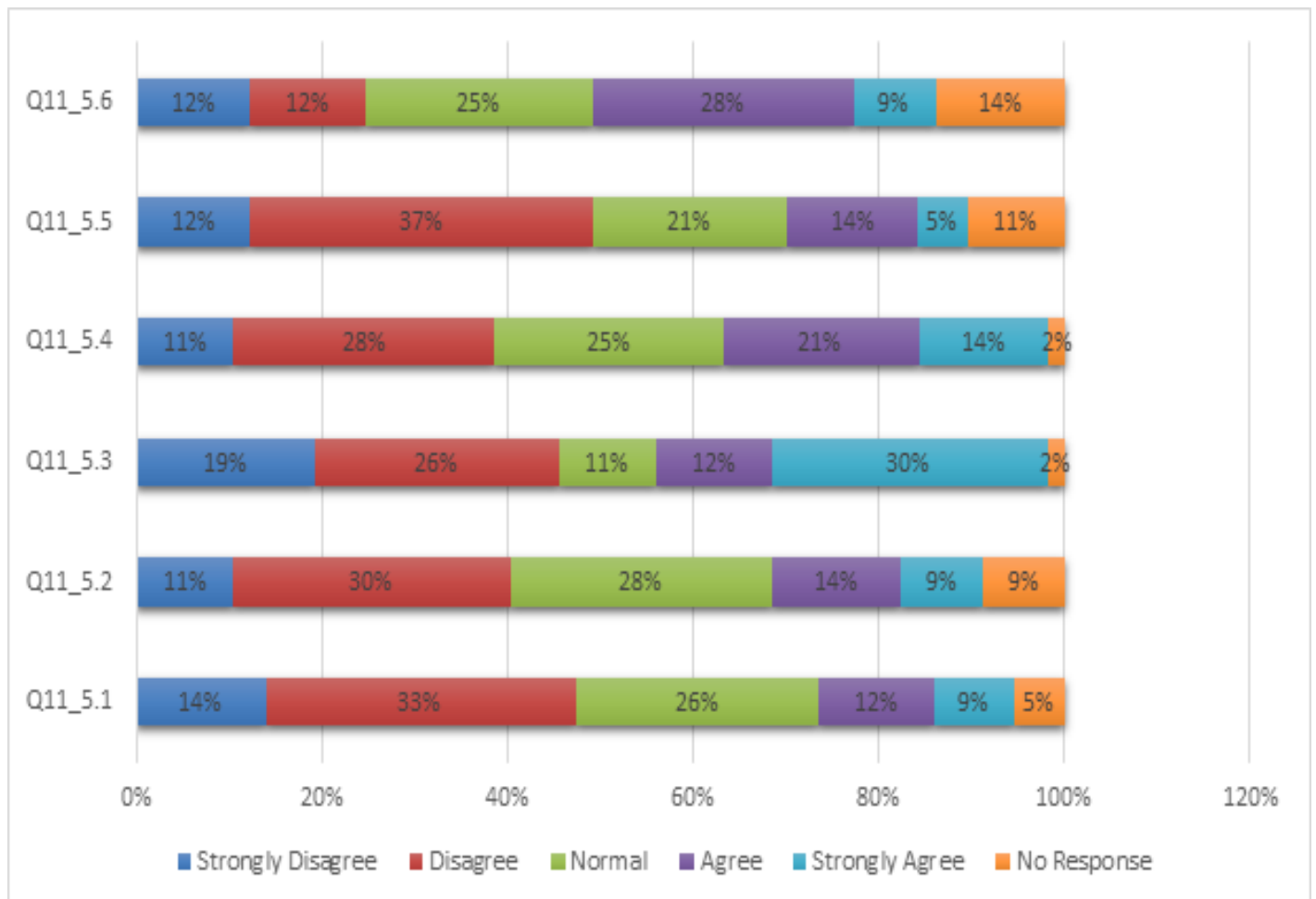
6.3 Changes in my family structure (e.g., divorce, remarriage, or separation) influenced me during childhood.

6.4 Economic challenges or crises in my country affected my family’s well-being.

6.5 Environmental changes (e.g., droughts or floods) influenced my life.

6.6 Personal transitions (such as coming of age, moving to new schools, or relocating to a new place) helped shape my identity.

Figure 8 Influence of the Chronosystem for the Development of Childhood



The findings related to chronosystem factors indicate varied influences of life events and transitions on respondents' development. Major national or global events (6.1) received more disagreement than agreement, suggesting that such events were not perceived as having a strong direct influence on childhood development for many respondents. Rapid technological changes (6.2) showed mixed responses, with a large proportion of disagreement and neutrality, indicating that technology had an uneven impact on learning and relationships. Changes in family structure (6.3) received relatively higher agreement, showing that family-related transitions played an important role in shaping childhood experiences for many respondents. Economic

challenges or crises (6.4) showed moderate levels of agreement, indicating that economic conditions had a noticeable effect on family well-being. Environmental changes (6.5) were largely viewed as having limited influence, as reflected by higher disagreement and neutral responses. Personal transitions such as moving schools or relocating (6.6) received the highest agreement, highlighting their strong role in shaping identity and development. Overall, the results suggest that personal and family-level transitions had a stronger impact on development than broader national or environmental events.

Comparative Distribution of Ecological System Factors:

Table 5 Comparative Distribution of Ecological System Factors

	N	Percentiles			Mean Rank
		25th	50th (Median)	75th	
Microsystem	57	29.00	33.00	37.00	4.49
Mesosystem	57	12.00	15.00	18.00	1.60
Ecosystem	57	24.00	29.00	36.50	4.24
Macrosystem	57	16.00	20.00	22.00	2.33
Chronosystem	57	14.00	17.00	24.50	2.34

The percentile distribution and mean rank analysis provide a clear comparative understanding of the relative influence of the five ecological systems on respondents' childhood experiences.

The Microsystem shows the highest central tendency, with a median score of 33.00 and relatively high 25th and 75th percentiles (29.00–37.00). This indicates that immediate environments such as family, peers, school, and close relationships had a consistently strong influence on respondents' development. This is further supported by the highest mean rank (4.49), confirming the microsystem as the most influential ecological level.

The Ecosystem (Exosystem) also demonstrates a strong influence, with a median score of 29.00 and a wide interquartile range (24.00–36.50), suggesting variability in how broader social structures such as parents' workplaces, community services, and economic conditions affected individuals. Its high mean rank (4.24) places it second only to the microsystem, highlighting the substantial indirect impact of societal and institutional factors.

In contrast, the Mesosystem records the lowest median score (15.00) and the lowest mean rank (1.60), indicating that interactions between microsystems - such as parent - teacher relationships and family - community linkages -

were perceived as less influential or inconsistently experienced by respondents. This suggests weak or uneven coordination among key support systems during childhood.

The Macrosystem shows moderate influence, with a median score of 20.00 and a relatively narrow percentile range (16.00 –22.00). Its mean rank (2.33) indicates that cultural values, social norms, laws, and policies had a noticeable but not dominant role in shaping development, possibly due to limited awareness or indirect exposure during childhood.

Similarly, the Chronosystem reflects a moderate level of influence, with a median score of 17.00 and a wider spread at the upper percentile (75th = 24.50), suggesting that while time-related changes and life transitions significantly affected some respondents; their impact was not uniform across the sample. Its mean rank (2.34) closely aligns with the macrosystem, indicating comparable influence.

Chi-Square analysis of ecological system rankings:

Table 6 Chi-Square Analysis of Ecological System Rankings

Friedman Test	
N	57
Chi-Square	153.045
df	4
Asymp. Sig.	.000

The Friedman test was conducted to examine whether there were statistically significant differences among the five ecological systems across the 57 respondents. The results show a Chi-square value of 153.045 with 4 degrees of freedom, and the Asymptotic Significance value is .000 ($p < .001$).

This indicates that there is a highly statistically significant difference in the median scores of the ecological systems. In other words, respondents did not perceive all ecological systems (Microsystem, Mesosystem, Exosystem/Ecosystem, Macrosystem, and Chronosystem) as having an equal level of influence on their childhood development.

The significant Friedman test result justifies the comparison of mean ranks, which reveals the relative strength of influence among the systems. Systems with higher mean ranks (such as the Microsystem and Ecosystem) exerted a stronger perceived influence, whereas systems with lower mean ranks (such as the Mesosystem and Macrosystem/Chronosystem) were perceived as less influential.

Overall, this finding confirms that childhood development is shaped unevenly across different ecological system levels, supporting the theoretical assumption of Bronfenbrenner’s Ecological Systems Theory that immediate and contextual environments influence individuals differently over time.

Hypothesis Testing Using the Friedman Test

Hypotheses:

- Null Hypothesis (H_0): There are no differences between the interconnected environmental systems in causing imprisonment.
- Alternative Hypothesis (H_a): There is at least one difference between the interconnected environmental systems in causing imprisonment.

The Friedman test revealed a statistically significant difference among the ecological systems, $\chi^2(4) = 153.045, p = 0.000$. Since the p-value is less than the significance level (0.05), the null hypothesis is rejected, indicating that at least one system has a different influence on imprisonment compared to the others. If needed, post hoc tests can be conducted to identify which specific ecological systems differ significantly.

Figure 9 Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distributions of Microsystem, Mesosystem, Ecosystem, Macrosystem and Chronosystem are the same.	Related-Samples Friedman's Two-Way Analysis of Variance by Ranks	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

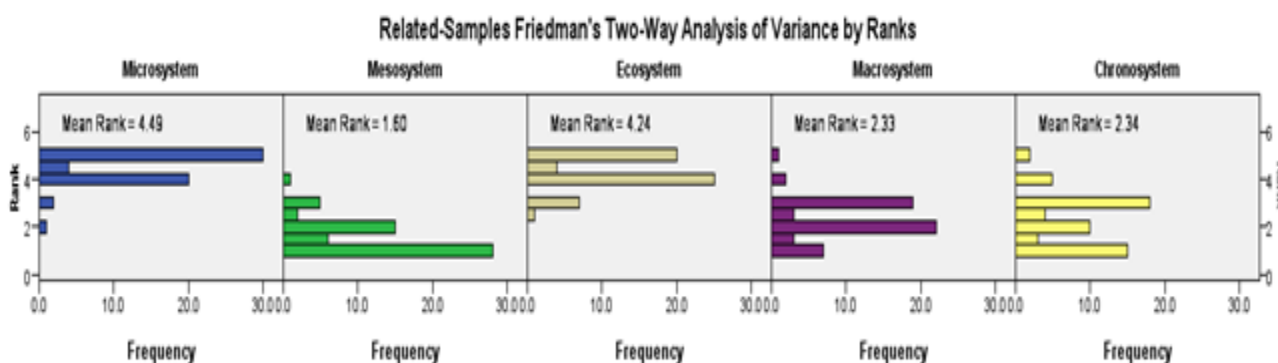
A related-samples Friedman two-way analysis of variance by ranks was conducted to examine whether there were differences in the distributions of the Microsystem, Mesosystem, Ecosystem, Macrosystem, and Chronosystem influences on childhood development.

The null hypothesis stated that *the distributions of all five ecological systems are the same*. The results of the Friedman test indicated a statistically significant difference among the ecological systems ($\chi^2(4) = 153.045, p = .000$). As the significance value was less than the accepted alpha level of .05, the null hypothesis was rejected.

This finding confirms that the five ecological systems do not exert equal influence on childhood development. Instead, the impact varies significantly across system levels, supporting Bronfenbrenner’s Ecological Systems Theory, which emphasizes differential influence of environmental systems on human development. The rejection of the null hypothesis further validates the comparison of mean ranks and percentile distributions, allowing for meaningful interpretation of the relative strength of each ecological system.

Analysis of Mean Ranks for Ecological Systems

Figure 10 Mean Ranks for Ecological Systems



Total N	57
Test Statistic	153.045
Degrees of Freedom	4
Asymptotic Sig. (2-sided test)	.000

The figure presents the mean ranks of the five ecological systems based on the Friedman test, illustrating their relative influence on childhood development in the sample of 57 respondents.

- The Microsystem received the highest mean rank (4.49), confirming it as the most influential system, reflecting the strong impact of immediate environments such as family, peers, and school.
- The Ecosystem (mean rank = 4.24) was the second most influential, indicating the importance of indirect influences such as parents’ workplaces, community resources, and institutional structures.
- The Chronosystem and Macrosystem had moderate mean ranks (2.34 and 2.33, respectively), suggesting that time-related changes, societal norms, and policies contributed moderately to childhood development.

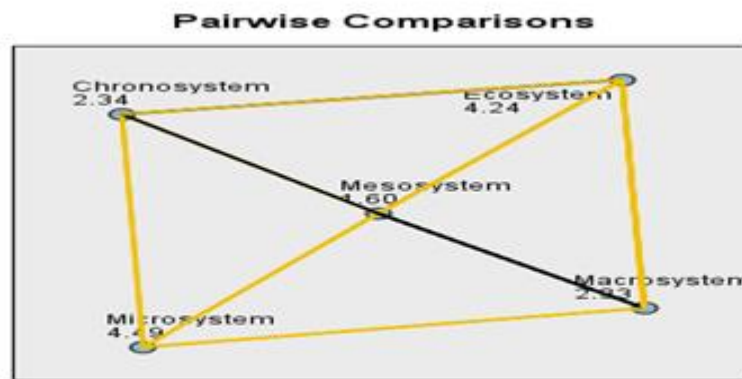
- The Mesosystem had the lowest mean rank (1.60), highlighting that interactions between microsystems (e.g., parent–teacher collaboration or family–community linkages) were perceived as less influential or inconsistently experienced.

The Friedman test results in the figure ($\chi^2 = 153.045$, $df = 4$, $p = 0.000$) confirm that these differences in influence are statistically significant, supporting the rejection of the null hypothesis and demonstrating that ecological systems impact childhood development to varying degrees.

This visual representation reinforces the quantitative analysis and provides a clear comparison of the relative influence of each ecological system.

Pairwise Differences in Ecological System Influences

Figure 11 Mean Ranks for Ecological Systems



Each node shows the sample average rank.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Mesosystem-Macrosystem	-.737	.296	-2.488	.013	.129
Mesosystem-Chronosystem	-.746	.296	-2.517	.012	.118
Mesosystem-Ecosystem	-2.640	.296	-8.915	.000	.000
Mesosystem-Microsystem	2.895	.296	9.774	.000	.000
Macrosystem-Chronosystem	-.009	.296	-.030	.976	1.000
Macrosystem-Ecosystem	1.904	.296	6.427	.000	.000
Macrosystem-Microsystem	2.158	.296	7.286	.000	.000
Chronosystem-Ecosystem	1.895	.296	6.397	.000	.000
Chronosystem-Microsystem	2.149	.296	7.256	.000	.000
Ecosystem-Microsystem	.254	.296	.859	.390	1.000

As shown in Figure 11, pairwise comparisons were conducted to examine differences among the five ecological systems following the significant Friedman test. Since five systems were analyzed, a total of ten pairwise comparisons were possible. The results indicate statistically significant differences in six comparisons: Mesosystem–Ecosystem ($p = .000$), Mesosystem–Microsystem ($p = .000$), Macrosystem–Ecosystem ($p = .000$), Macrosystem–Microsystem ($p = .000$), Chronosystem–Ecosystem ($p = .000$), and Chronosystem–Microsystem ($p = .000$). These findings suggest that the Microsystem and Ecosystem differed significantly from the Mesosystem, Macrosystem, and Chronosystem in terms of perceived influence. The remaining pairwise comparisons were not statistically significant, indicating relatively similar influence levels among those systems.

Discussion:

The findings reveal socio-demographic patterns among drug-addicted prisoners, indicating that substance abuse and imprisonment occur across all religious groups in Sri Lanka. This pattern aligns with the Statistical Report on Drug-Related Arrests in Sri Lanka (2024), which shows higher representation among Buddhists, followed by Muslims, Hindus, and Christians. The distribution confirms that drug addiction is not confined to a single religious group. Although religious affiliation alone is not a sufficient protective factor, the strong religious presence among respondents suggests that faith-based rehabilitation approaches may be effective when combined with psychosocial interventions.

Educational attainment among respondents was generally low, with most having completed only basic schooling up to Grade 9. Limited completion of O/L examinations indicates restricted educational engagement and reduced employment opportunities, which may increase vulnerability to substance abuse. The concentration of respondents in the Colombo District highlights the influence of urbanization, where greater exposure to drugs, peer pressure,

and social risks may contribute to higher incarceration rates.

Family characteristics further highlight the social impact of imprisonment, as most respondents were married and had significant family responsibilities. Living arrangements indicate continued reliance on family support, which may function as both protective and risk factors. Occupationally, most respondents were engaged in informal or semi-skilled employment, often marked by job insecurity and financial instability, conditions that may increase susceptibility to drug use. Furthermore considering Statistical Report on Drug-Related Arrests in Sri Lanka (2024), indicate same proportion in aged 25 to 29. Also the majority were reported from Colombo district, 52.9% married as this group, even though this report indicate highest amount of drug use was reported from have completed O/L in this sample indicate up to grade nine. This study investigated the job category based on the Holland's code Career model. According that majority of the sample indicate the realistic job. That means looks like labors. Same nature indicated the statistical report on drug related arrested in Sri Lanka. (2024).

Overall, the findings suggest that drug addiction and imprisonment result from multiple interconnected socio-demographic factors rather than a single cause. This underscores the need for comprehensive prevention and rehabilitation strategies that integrate education, employment opportunities, family support, and community-based interventions to reduce substance abuse and recidivism.

The findings show that family support, peer relationships, teachers, and religious education were the most influential microsystem factors in participants' childhoods, while neighbors and classmates had a less consistent influence. This pattern supports Bronfenbrenner's Ecological Systems Theory, which emphasizes the importance of close and direct interactions in shaping emotional, social, moral, and educational development. Similar to previous studies, peer relationships played a key role in developing self-

confidence and positive behavior (Wentzel, 1998; Hartup, 2005) In contrast, the weaker influence of neighbors is consistent with studies suggesting that community-level factors are less influential than family and school environments (Leventhal & Brooks-Gunn, 2000). Overall, these findings confirm that close relationships within the microsystem play a central role in childhood development.

The findings indicate that exosystem and macrosystem factors had a generally limited and uneven influence on participants' childhood development. Many respondents reported that parents' employment conditions did not positively support their well-being. This aligns with prior research showing that parental work instability indirectly affects children through increased family stress (Conger & Donnellan, 2007; Repetti et al., 2019). Community organizations and school administrative practices were perceived as inconsistently supportive, reflecting uneven access to quality community engagement and school-level support. Previous studies similarly note that such structures function as protective factors only when they are accessible and effectively implemented (Leventhal & Brooks-Gunn, 2000; OECD, 2018). In contrast, media emerged as a stronger macrosystem influence, with many respondents acknowledging its role in shaping attitudes and behaviors, consistent with research on media's impact on child and adolescent development (Livingstone & Helsper, 2007).

Perceptions of state laws, public services, and welfare programs were largely neutral or negative, indicating limited awareness, weak implementation, or restricted access. Economic hardship was identified as a major negative influence, supporting the Family Stress Model, which links financial strain to adverse developmental outcomes (Masarik & Conger, 2017). Overall, these findings support Bronfenbrenner's Ecological Systems Theory by demonstrating that indirect environments influence childhood development unevenly through their interaction with family and community contexts. Strengthening employment

conditions, policy implementation, community resources, and social welfare systems is essential to promote more equitable developmental outcomes.

The findings indicate that macrosystem factors related to culture and society exerted a moderate but uneven influence on childhood development. Cultural elements such as religious beliefs, environmental values, and gender expectations emerged as more salient influences, suggesting that deeply embedded social norms play a key role in shaping children's values, identity formation, and moral development. This supports prior research demonstrating that religion and cultural belief systems function as powerful macrosystem forces by providing moral frameworks and behavioral guidelines that influence children indirectly through family and community practices (King & Boyatzis, 2015; Super & Harkness, 2020).

In contrast, public health services, access to technology, and community organizations showed more variable and context-dependent effects. These inconsistencies may reflect disparities in access, quality, and awareness, particularly in low- and middle-income contexts. Previous studies have noted that structural resources at the macrosystem level contribute to positive developmental outcomes only when they are equitably distributed and effectively integrated into daily life (Viner et al., 2012; UNICEF, 2021). Similarly, unequal access to digital technology has been shown to widen developmental and educational gaps rather than uniformly enhance learning opportunities (Livingstone et al., 2017).

Overall, these findings reinforce Bronfenbrenner's Ecological Systems Theory, highlighting that macrosystem influences do not operate uniformly but interact dynamically with family, school, and community contexts. The results underscore the importance of culturally sensitive and context-responsive policies that strengthen positive societal norms while addressing structural inequalities to promote more equitable childhood development outcomes.

The findings indicate that chronosystem influences were experienced unevenly across participants' childhoods. Large-scale national or environmental events affected some individuals, but their impact was not universal. In contrast, economic hardship and personal life transitions—such as changes in family circumstances, schooling, or residence—emerged as more salient influences on development. This suggests that proximal, time-bound experiences had a stronger developmental effect than distant or indirectly experienced events.

These results align with Bronfenbrenner's Ecological Systems Theory, which emphasizes that development is shaped not only by environmental contexts but also by the timing and sequencing of life events (Bronfenbrenner, 1992). Consistent with prior research, economic instability during childhood has been shown to disrupt family functioning and increase developmental risk through cumulative stress processes (Masarik & Conger, 2017). Similarly, personal transitions such as school changes and residential mobility have been identified as critical periods that influence identity formation and psychosocial adjustment

Overall, the findings highlight the importance of life-course timing and transitional experiences in shaping developmental trajectories, reinforcing the need for early and sustained support during periods of economic strain and major life change.

Taken together, the findings strongly support Bronfenbrenner's Ecological Systems Theory, demonstrating that proximal and directly experienced systems, particularly the microsystem, exert the greatest influence on childhood development. Indirect systems such as the ecosystem also play a critical role, while mesosystem interactions appear weaker. Broader cultural, policy-related, and time-based influences contribute moderately, shaping development in less direct but meaningful ways. These results emphasize the importance of strengthening immediate support systems while improving coordination, policy implementation, and long-term social support mechanisms.

The findings from the comparative distribution and Friedman test analyses provide clear evidence that the five ecological systems exert differential influence on childhood development among the sample of 57 respondents. Consistent with Bronfenbrenner's Ecological Systems Theory, the Microsystem was identified as the most influential system, reflecting the critical role of immediate environments such as family, peers, and school in shaping emotional, social, and cognitive development (Bronfenbrenner, 1992). The Ecosystem (Exosystem) demonstrated the second highest influence, highlighting the importance of indirect environmental contexts, such as parental workplaces and community resources, which affect children through their impact on proximal environments (Leventhal & Brooks-Gunn, 2000; Viner et al., 2012). In contrast, the Mesosystem, representing interactions between microsystems (e.g., parent-teacher collaboration), was perceived as least influential, suggesting inconsistent interconnections between key support systems. The Macrosystem and Chronosystem showed moderate influence, indicating that cultural norms, policies, economic conditions, and life transitions play meaningful but uneven roles in development. The Friedman test results ($\chi^2(4) = 153.045, p = .000$) confirm significant differences among ecological systems, and pairwise comparisons demonstrate that the Microsystem and Ecosystem differ significantly from the other systems in perceived influence. These findings align with prior research emphasizing the primacy of direct and proximate environments in shaping developmental outcomes (Bronfenbrenner, 1992; Wang & Degol, 2016). Overall, the study highlights that childhood development is unevenly shaped across ecological layers. Strengthening family, school, and community linkages, and improving the implementation of macro-level supports are essential to promote more equitable developmental outcomes.

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