



MLDS CENTER

Maryland Longitudinal Data System

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Memorandum

To: MLDS Governing Board

From: Mr. Ross Goldstein, Executive Director

Date: September 4, 2026

Subject: Project Approvals and Updates

Purpose

This agenda item is to update the Board on:

1. Projects that have been reviewed and approved by the Executive Director under the *Project Approval and Management Procedures*;
2. When necessary, projects that require Governing Board approval; and
3. Updates on ongoing projects.

Please note that in addition to the information presented for each new project, this memorandum also includes the complete project abstract submitted by the researcher for your further information and review.

Approved Projects

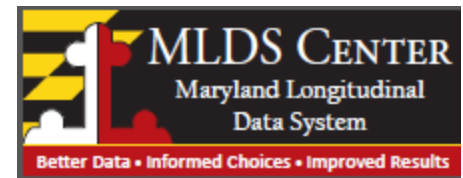
ERA # 141	Evaluating the Effect of the English as a Second Language (ESL) Reclassification Policy on Students' Test Scores and Academic Outcomes
Researcher	Mr. Fadel Ugarte UMBC
Research Questions	1. What are the secondary and postsecondary outcomes of current and reclassified English Language (EL) students? 2. Is there a statistical difference in the academic outcomes of current and reclassified EL students? If so, can this difference be attributed to the state's English Language Development (ELD) reclassification policy? 3. What implications, if any, do the findings of RQ2 have for Maryland's ELD reclassification policy?
RPB Review	The RPB was supportive of the project.

Exec. Dir. Determination	Approved. The subject of this project is responsive to the Research Agenda, provides information about student performance that can be used to improve the state's education system, requires the use of longitudinal cross sector data, and is being conducted by a qualified researcher.
Board Action	Informational

ERA # 147	Interwoven Life Courses: A Multi-Channel Sequence Analysis of Placement, Education, and Juvenile Justice Trajectories Among Children in Out-of-Home Care in Maryland
Researcher	Ms. Meng-Hsuan Yu University of Maryland School of Social Work
Research Questions	1. What distinct trajectory patterns of placements, education, and involvement in juvenile justice are observed among children placed in (Out-of-Home Care) OOHC in Maryland? 2. Are individual- (e.g. demographics) and contextual (e.g. community poverty and crime rate) factors predictive of membership in identified trajectories? 3. Do trajectory patterns predict adolescence and young adulthood life, including high school graduation/GED, apprenticeships, educational attainment (e.g., high school completion and college enrollment) and early labor market outcomes (e.g., employment) and what patterns of disparities emerge across trajectory groups? 4. What risk factors predict OOHC reentry within a predictive risk modeling framework, and does the inclusion of the trajectory membership improve model performance?
RPB Review	The RPB was supportive of the project.
Exec. Dir. Determination	Approved. The subject of this project is responsive to the Research Agenda, provides information about student performance that can be used to improve the state's education system, requires the use of longitudinal cross sector data, and is being conducted by a qualified researcher.
Board Action	Informational

Project Updates (Informational)

On August 6th, the Institute of Education Sciences released its first round of Fiscal Year 2027 requests for applications, including programs for the National Center for Education Research and the National Center for Special Education Research. Proposals are due October 1. The Research Branch is coordinating several proposal submissions, including proposals to the State Longitudinal Data Systems State Policymaking grants program and the Research Training Programs grant program.



*This form is subject to disclosure in a Public Information Act request.

Project Title	Agency Control #
Evaluating the Effect of the ESL Reclassification Policy on Students' Test Scores and Academic Outcomes	141

Contents

Section 1. Principal Investigator.....	1
Section 2. Project Information.....	2
Section 3. MLDS Center Research Agenda.....	2
Section 4. Data and Cross Sector Analysis.....	4
Section 5. Financial Information.....	5
Section 6. Special Considerations.....	6
Section 7. Project Team.....	7
Section 8. Submission.....	7

Section 1. Principal Investigator

Principal Investigator (please list additional project team members in Section 7)
Fadel E. Ugarte
Principal Investigator's Email Address
fadelu1@umbc.edu
Name of University or Organization
University of Maryland, Baltimore County
Principal Investigator Background and Qualification (provide overview of experience and attach a CV)
MLDS research team member since August 2024. PhD Candidate in Public Policy from UMBC. Previous work experience includes working as a junior economist at the Inter-American Development Bank (IDB).

A completed form is available [here](#) for your review.

Important: Once submitted, this application is a public document that will be shared with stakeholders throughout the project review process and generally made available pursuant to a *Public Information Act Request*.

Section 2. Project Information

Background and Purpose of the Study (No more than 500 words; please include references; references do not count toward the word count)
English Learner (EL) students are among the fastest-growing student populations in the US (Flynn & Hill, 2005; Tran, 2015). Although Maryland has not historically been a high-EL-growth state, its proportion of EL students has increased rapidly since 2017, rising from 8.5% of its entire student population to 10.7% in 2020 (Maryland State Department of Education [MSDE], 2022). By 2021, the proportion of EL students in Maryland had surpassed the national average, reaching 11.2% (98,567 students), compared to 10.6% nationwide (MSDE, 2022; NCES (a), 2025). EL students experience additional challenges in their education compared to their non-EL peers. They must learn a new language while simultaneously learning the content of their other classes (Flynn & Hill, 2005). This added burden, along with limited access to proper educational resources, explains why EL students generally exhibit poorer academic outcomes than their non-EL peers (Batt, 2008; Master et al., 2016; Gibson, 2016). However, a growing body of literature has found evidence that strong English as a Second Language (ESL) programs can help reduce this academic gap (Loeb et al., 2014; Master et al., 2016). Descriptive statistics from the MSDE show that EL students who achieve English proficiency score higher than their EL peers and, in some cases, higher than the state's average for all students in their grade (MSDE, 2022). These results are consistent across all test components of the Maryland Comprehensive Assessment Program (MCAP) for the grades 3rd – 8th for the years 2016-2019. For example, the average ELA proficiency rate across all grades was 49.9% in 2019 for reclassified EL students, compared to 8.4% for current EL students (MSDE, 2022). Moreover, the average proficiency rate for reclassified EL students was 6.2 percentage points higher than that for all students (MSDE, 2022), indicating a reduction in the achievement gap between EL students and their peers. The same pattern is observed in the math section of the test. However, there are no state-level studies on whether the effects of ESL instruction carry over into longer-term academic outcomes, such as high school graduation rates and college enrollment. Studies evaluating this hypothesis in other states use English Proficiency test scores to determine whether being reclassified as English proficient (after being an EL student) by the 10th grade, a crucial stage for postsecondary education, affects postsecondary academic outcomes (Carlson & Knowles, 2016). The purpose of this study is to use Maryland's ACCESS test scores to evaluate the impact of being reclassified as a former EL student on student secondary and postsecondary outcomes, such as SAT scores, high school graduation rate, course-taking, and college enrollment rate and college attainment, to provide evidence on the effectiveness of Maryland's ESL instruction and ESL reclassification policy.
Research Project Question
1. What are the academic secondary and postsecondary outcomes of current and former EL students? 2. Is there a statistical difference in the academic outcomes of current and former EL students? If so, can this difference be attributed to the effectiveness of EL instruction and the state's EL reclassification policy?

3. Do the results from RQ2 suggest that the state would benefit from a reform of its EL reclassification policy? If so, provide recommendations.
Research Methods (Please include information for: Sample/Cohort and Justification; Definition of Measures and Constructs; Analysis Approach) Using all available cohorts, I will identify current and former EL students in Maryland by academic year as the main study population. In addition to their EL status, MSDE data will allow me to identify their achievement indicators, demographics, and educational history (enrollment, attendance, access to other specialized programs). High school experiences (e.g., magnet school attendance, advanced coursework, etc.) will be tracked through course files, grade progression, and completion. For this study, we are particularly interested in their ACCESS test scores, which is the English test administered to EL students in Maryland to determine whether they are proficient in the language or need additional support. ACCESS test scores are not currently available in the MLDS data, so these would need to be added. The first step will be to identify current and former EL students. Then, using descriptive statistics, we will compare their secondary achievement outcomes (magnet school attendance, state assessment scores), their college readiness outcomes (SAT/ACT scores, high school completion), and their postsecondary outcomes (college enrollment) (RQ1 and part of RQ2). To determine whether the observed differences are attributable to receiving ESL instruction and being reclassified as an English-proficient student, I will use regression models to test for causality. Following Carlson & Knowles (2016), who conducted a similar study for the state of Wisconsin, I plan to use a Regression Discontinuity (RD) design. The RD method uses a mechanism that exogenously assigns individuals to treatment and comparison groups to analyze differences in outcomes for individuals on both sides of a cutoff threshold (established by the mechanism), attributing these differences to the treatment effect. In this study, Maryland's reclassification policy (the mechanism) assigns individuals to the treatment group (English-proficient students) and the comparison group (EL students who did not achieve a passing score) based on a cutoff score of 4.5 or higher on the ACCESS test. In theory, we expect to observe a difference in average academic achievement indicators on both sides of the cutoff. Because the reclassification policy is exogenous to each school and students, any difference in average achievement outcomes can be attributed to receiving ESL instruction and being reclassified as an English-proficient student (RQ2). Applying the RD to secondary and post-secondary outcomes will provide causal evidence regarding the effect of reclassification on student outcomes. The results for RQ2 will be analyzed, providing a set of policy implications for stakeholders (RQ3).
How will this research benefit the State of Maryland in terms of state or local policy and/or practice? The results will provide information about: 1. Academic indicators of the EL student population that are not available in the report "Blueprint for Maryland's Future: Workgroup on English Learners in Public Schools." For example, standardized test scores such as the SAT by current and former EL students, their high school graduation rates, course-taking, college enrollment rates, college attainment, and other post-secondary outcomes.

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2. A comprehensive analysis of Maryland's EL reclassification statistics. This will include the number of students who passed and failed the ACCESS test by academic year, to potentially identify trends and fluctuations in the data.
3. An evaluation of Maryland's reclassification policy, which will allow us to determine whether former EL students, reclassified by the 10th grade, achieve better academic outcomes than students who do not meet the reclassification standards.

It is worth noting that the results under (3) will provide empirical evidence on the effectiveness of the ESL instruction in the state. If there is a statistical difference between the two student subgroups, this could be attributed to the quality of ESL instruction. Conversely, the absence of a statistical difference could signal the need for greater investment in ESL teaching.

Explain why this research requires longitudinal cross-sector data?

The research requires observing a substantial period of students' EL experiences and linking these experiences with secondary and postsecondary outcomes in college data. Depending on the number of EL students who take the ACCESS test each year, the sample size in cross-sectional data may be insufficient to run robust statistical models.

Proposed Center Output

(Typical products for the MLDS Center include a research series presentation to stakeholders and a research brief in the MLDS Center template).

Research series presentations on RQ 1, 2, and 3

Research brief with recommendations for enhanced programs and student support.

Timeline for the proposed project (identify major deliverables and approximate dates)

December 2026 – Preliminary analysis on RQ1

January 2027 – Preliminary analysis on RQ2

March 2027 – Presentation on RQ1, 2 and 3.

April 2027 – Completed study of statewide outcomes

Summer 2027-2029 – Further development of academic papers

Plans for further development (i.e. journal submission, etc)

Further development will include academic articles to be included in my dissertation, submitted to academic conferences (such as APPAM), and submitted for publication in academic journals (such as *Education Policy* and *Educational Evaluation and Policy Analysis*).

Section 3. MLDS Center [Research Agenda](#)

Does your project relate to one of the following areas which the General Assembly has specifically directed the MLDSC to study:	Yes	No
The impact of a State or federal education program? ¹	X	
The performance of educator preparation programs?		X
Best practices regarding classroom instruction?		X

¹ All projects must relate to a state or federal education program. If you are not sure, please contact ross.goldstein@maryland.gov.

Project Approval - Detailed Application

The impact of child welfare programs on the educational and economic outcomes of students?		X
An analysis of social determinants, provided by State agencies ² and appropriate local agencies, that impact education performance of students and indicate the need for wraparound services for students.		X
Does your project use State or Federal financial aid ³ data?		X
If you are requesting to use FAFSA data please explain how this research will benefit the administration of Title IV federal financial aid.		
Research Agenda Category (page 2 of the Research Agenda) – Which category does the project address? Please explain.		
Programs and Policy Evaluation – The purpose of the study is to evaluate the effectiveness of ESL instruction in the state in improving the academic outcomes of this subgroup of students.		
Research Agenda Themes (page 2-3 of the Research Agenda) - Which cross cutting theme is incorporated in the project? Please explain.		
Social determinants – The study will examine academic outcomes by EL status and race/ethnicity. Other social indicators, such as economic status, will be used as controls in the models. Equity and inclusion – The study will examine the support structures for EL students and provide policy recommendations to further improve them.		

² State agencies include: Maryland Department of Health, Department of Human Services, and Department of Juvenile Services

³ Financial aid data derived from the FAFSA may only be used in research to improve the administration of federal financial aid programs.

Section 4. Data and Cross Sector Analysis

Please review the MLDS Center [Data Inventory](#) and the MLDS Center [Data Gap Analysis](#) prior to completing this section.

Sectors* *The data falling within each sector is outlined below. The purpose of this section is to ensure the project is cross sector. Projects will not necessarily use all data elements within the sector (see methods section for definitions of measures).	X
Early Childhood Education Sector	
K-12 Education Sector	X
Adult Education Sector	
Justice Involved Youth Sector	
Child Welfare Sector	
Postsecondary Education Sector	X
Other Completions and Credentials Sector	
Workforce Sector	

Put an 'x' next to each data sector your project will include. You must have at least 2 sectors.

Do you plan to request to include external data as part of your project?

*Sectors

Early Childhood Education Sector

- PreK Academic Engagement

K-12 Public School Education Sector

- Enrollment and attendance
- Assessments
- Courses and grades
- Completions
- Discipline
- Public School Characteristics

Adult Education Sector

- GED/NEDP Exam Results
- Apprenticeship
- Adult Education
- Correction Education

Juvenile Justice Sector

- Juvenile Justice Records
- Juvenile Education Records

Child Welfare Sector

- Out-of-Home Placements

Postsecondary Education Sector

- College and University Enrollment
- College and University Courses, Credits and Grades
- College and University Degrees
- College and University Workforce Training
- Financial Aid

Other Completions and Credentials Sector

- Industry Certifications
- Licenses

Workforce Sector

- Public School Teachers
- Public School Staff
- Workforce visibility/participation
- Workforce Earnings
- Workforce Industry

Section 5. Financial Information

The MLDS Center incurs costs for every project related to: (a) IT support and infrastructure; (b) assistance from subject matter experts, (c) criminal history background checks; and (d) creation of an analytic data set. Average project costs are between \$1,000 and \$3,000. A detailed, customized estimate will be provided prior to project initiation. (Please indicate your answer with an "X")	
☐	I will reimburse MLDS Center for all applicable fees.
☐	I will only be able to provide partial reimbursement.
X	I will need a waiver.
Grant Funding (indicate with an 'X')	
☐	This project has already received funding
X	I plan to apply or am in the process of applying for grant funding
☐	No grant funding is planned
Name of Grantor	
University of Maryland, Baltimore County	
RFP or Grant Program Information (you may provide a link to the grantor's website)	
Graduate Student Research Grant https://gsa.umbc.edu/research-grants/	
Amount of grant funds sought or awarded.	
\$1,000	
Grant Application Date	
Upon approval of this project application.	
Do you intend to proceed without grant funding?	
Are you receiving other funding for this proposed project? If yes, how much?	
No	

Section 6. Special Considerations

Principal Investigators NOT affiliated with a Maryland College or University – please provide information on:

- a. Your familiarity with Maryland policies affecting your research topic; and
- b. How your project meets a specific Maryland research need?

Please also upload (with this form) any letters of reference or endorsement from a Maryland researcher or a State or local agency that vouches for your qualifications and expertise.

For projects that involve a small population, please confirm that you are aware of the MLDS Center's [data suppression policy](#) and explain how you will report your findings while conforming to the suppression requirements.

For projects that involve a single school system, university, or program, please explain the statewide implications of the project.

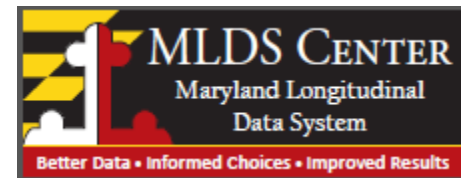
Please also upload (with this form) any letters of support from the subject (i.e. school system or university) of the study.

Section 7. Project Team

Project Team - Please list all members of the research team and indicate roles and responsibilities. - If the Principal Investigator listed in Section 1 above is NOT the primary point of contact for the project (including research, data access, and presentations to stakeholders), please indicate which team member is the primary point of contact and provide that individual's contact information.		
Name and Organization	Role	Is system access needed? (Yes/No)
Fadel Ugarte, UMBC	PI	Yes
Jane Arnold Lincove, UMBC	Dissertation Adviser	Yes
Angela Henneberger, UMB	Dissertation committee member	Yes

Section 8. Submission

Once this form is completed, please complete the online application ([here](#)) and upload this form, CVs for all members of the research team, and any other supporting materials.



*This form is subject to disclosure in a Public Information Act request.

Project Title	Agency Control #
Interwoven Life Courses: A Multi-Channel Sequence Analysis of Placement, Education, and Juvenile Justice Trajectories Among Children in Out-of-Home Care in Maryland	ERA 147

Contents

Section 1. Principal Investigator	1
Section 2. Project Information	2
Section 3. MLDS Center Research Agenda.....	10
Section 4. Data and Cross Sector Analysis	13
Section 5. Financial Information	14
Section 6. Special Considerations	16
Section 7. Project Team	17
Section 8. Submission	17

Section 1. Principal Investigator

Principal Investigator (please list additional project team members in Section 7)
Meng-Hsuan Yu
Principal Investigator's Email Address
Email: meng-hsuan.yu@ssw.umaryland.edu
Name of University or Organization
University of Maryland School of Social Work
Principal Investigator Background and Qualification (provide overview of experience and attach a CV)
Meng-Hsuan Yu has completed all required Ph.D. coursework, including advanced training in child welfare research, data analytics, and predictive modeling. Since 2023, she has collaborated with faculty at the University of Maryland School of Social Work on research using Maryland child welfare administrative data, including the Maryland Children and Family Services Review (CFSR). Through this work, she has developed strong quantitative and data management skills, including proficiency in SAS and large-scale administrative data analysis, as well as experience in child welfare policy evaluation and applied research.

Important: Once submitted, this application is a public document that will be shared with stakeholders throughout the project review process and generally made available pursuant to a *Public Information Act Request*.

Project Approval - Detailed Application

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A completed form is available [here](#) for your review.

Section 2. Project Information

Background and Purpose of the Study

(No more than 500 words; please include references; references do not count toward the word count)

Background

In 2025, approximately 5,723 Maryland youth were removed from their homes and placed in out-of-home care (OOHC) at varying ages and developmental stages (The Governor's Office for Children, 2026). Many endure multiple system transitions—placement moves, school changes, juvenile justice contact, and OOHC re-entry—that compound vulnerability and disrupt educational trajectories (Clemens et al., 2018). Only 56% of Maryland youth with OOHC experience enroll in college and 19% complete degrees, compared to 77% and 55% in the general population (MLDS Center, 2024a). This educational instability translates into labor market disadvantage: by age 24, only half of former foster youth are employed, and 22% remain in poverty (Goyette et al., 2021; Hook & Courtney, 2011). OOHC experiences also shape justice-system involvement. Prior child welfare contact and placement instability significantly increase delinquency risk (Herz et al., 2023; Ryan & Testa, 2005), and environmental stressors—community violence, economic downturns—intensify these dynamics (Chen et al., 2016; Hook & Courtney, 2011). Together, these findings highlight opportunities for stronger cross-system coordination to support greater stability at earlier stage and more positive transitions to self-sufficient adulthood for children involved in OOHC in Maryland.

Theoretical Framework

This study integrates two complementary frameworks. The Life Course Perspective (LCP) conceptualizes development as a set of interwoven, age-graded trajectories shaped by shifting social contexts (Elder, 1998), emphasizing how the timing, duration, and sequencing of events—such as OOHC placements—shape life trajectories (Fallesen, 2014; Havlicek, 2010; Jones et al., 2024; McGrath-Lone et al., 2020). Ecological Systems Theory, refined into Bronfenbrenner's Process–Person–Context–Time (PPCT) model (1995), frames development as emerging from dynamic interactions between individuals and nested environmental systems—family, school, child welfare, and juvenile justice—over time.

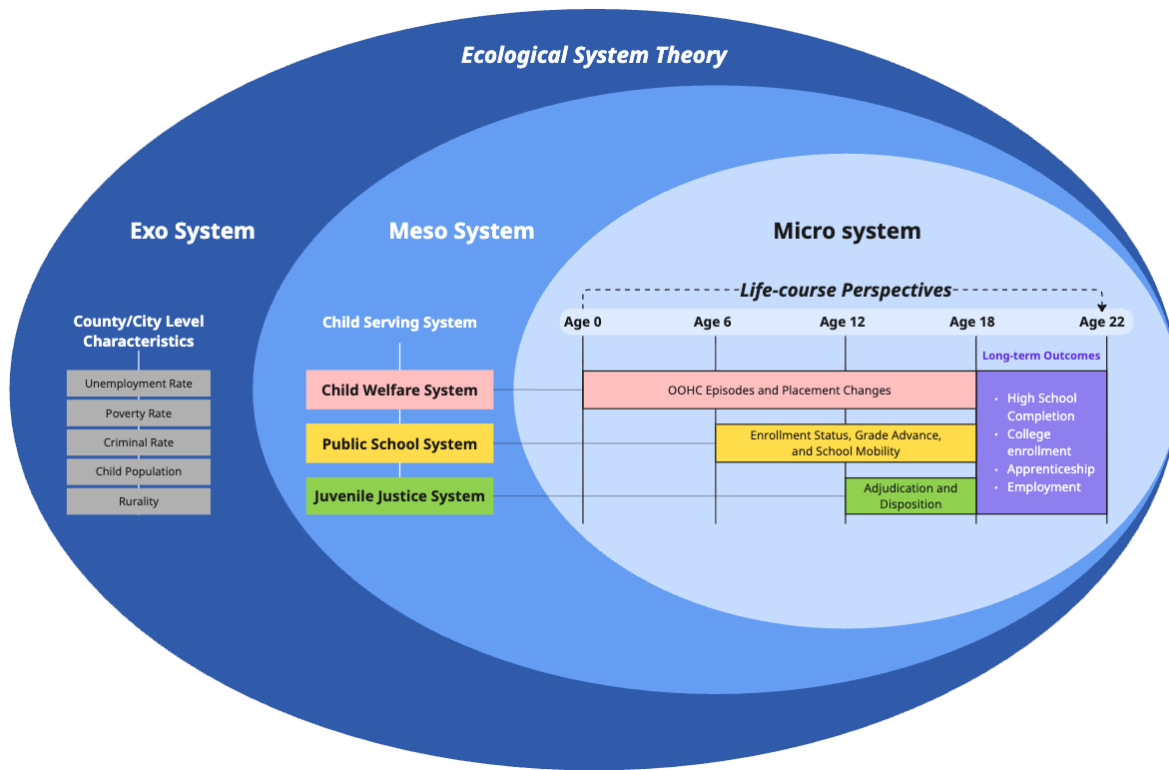
Together, these frameworks position children's placement experiences as temporally unfolding processes shaped by interacting ecological systems. The LCP foregrounds when and how placement sequences accumulate into distinct pathways; the ecological framework foregrounds the multiple systems within which these sequences occur. This integration justifies a methodological approach combining sequence analysis to identify placement trajectory patterns with regression and predictive modeling to examine their individual, contextual, and developmental factors and young adulthood outcomes.

Purpose of the Study

This study aims to model childhood trajectories across child welfare, education, and juvenile justice to better understand their predictors and outcomes. Here, a trajectory is defined as a chronologically ordered string of categorical states representing the specific evolution of an individual's life course over time. Grounded in life course perspective (Elder, 1998) and ecological systems theory (Bronfenbrenner, 1995), we examine how out-of-home care (OOHC) placement changes, academic performance, and justice involvement may shape subsequent outcomes like high school graduation/GED, Apprenticeships, post-secondary education and employment (Figure 1). Integrating these multi-system sequences is vital because children's experiences and longitudinal instability often extend across multiple systems rather than remaining within a single agency. Ultimately, identifying

high-risk trajectories and factors associated with placement instability and OOHC reentry seeks to contribute to an evidence base that could help guide earlier interventions, reduce longer-term socioeconomic disadvantage, and strengthen coordinated policy and practice responses in Maryland. A cross-system perspective further emphasizes shared responsibility for addressing needs early and promoting better outcomes for youth in OOHC.

Figure 1. Conceptual Model



References

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Research Project Question

1. What distinct trajectory patterns of placements, education, and involvement in juvenile justice are observed among children placed in OOH in Maryland?
2. Are individual- (e.g. demographics) and contextual (e.g. community poverty and crime rate) factors predictive of membership in identified trajectories?
3. Do trajectory patterns predict adolescence and young adulthood life, including high school graduation/GED, apprenticeships, educational attainment (e.g., high school completion and college enrollment) and early labor market outcomes (e.g., employment) and what patterns of disparities emerge across trajectory groups?
4. What risk factors predict out-of-home care (OOHC) reentry within a predictive risk modeling framework, and does the inclusion of the trajectory membership improve model performance?

Research Methods

(Please include information for: Sample/Cohort and Justification; Definition of Measures and Constructs; Analysis Approach)

Sample

The universal sample for this study includes children born between 2002 and 2007 who were ever placed in out-of-home care (OOHC) since 2008 in Maryland and attended a Maryland public school. To achieve the research aims, this study utilizes the Maryland Longitudinal Data System (MLDS) administrative records spanning 2008 to 2024. This comprehensive, cross-sector dataset integrates

individual-level data from multiple public sectors—including child welfare, public education, the juvenile justice system, postsecondary education, adult education and workforce employment.

Leveraging these multi-system records allows for the construction of multi-aspect childhood trajectories while structurally minimizing the left-truncation bias inherent in the 2008 data observation start date.

The analytical sample is further refined to answer specific Research Questions (RQs):

1. For RQ1 and RQ2 (Trajectory Construction & Prediction):

The study constructs and clusters multi-channel trajectories from ages 6 to 17 using the full birth cohort (2002–2007), subsequently utilizing baseline sociodemographic and contextual factors to predict membership across the emergent trajectory typologies.

2. For RQ3 (Young Adult Outcomes):

To examine the relationship between adolescent trajectory patterns and early adult self-sufficiency, the sample is restricted to youth born between 2002 and 2004. This subsample ensures that individuals cleanly reach young adulthood (ages 20–22) within the observed 2008–2024 MLDS data window, allowing for the rigorous longitudinal assessment of long-term outcomes such as high school graduation/GED, apprenticeship, college enrollment, and formal employment.

3. For RQ4 (OOHC re-entry prediction):

To integrate sequence analysis with predictive risk modeling to forecast OOHC re-entry between ages 13 and 15, a narrower subsample is established based on specific institutional eligibility criteria. The sample criteria for RQ4 are restricted to youth who: (1) experienced an OOHC placement spell and subsequently achieved a discharge to permanency before their 13th birthday within the post-2008 observation window, and (2) were living continuously in the community and not in active OOHC on the day of their 13th birthday, establishing a true at-risk baseline.

Table 1. Estimated sample description

Group	Whole sample	Young adult subsample	Re-entry subsample
Estimated sample size	4,005	1,936	1,911
Birth year	2002-2007	2002-2004	2002-2007
Earliest year starting Kindergarten	2006	2006	2006
Age in 2024	17-22	20-22	17-22
Observed outcomes	Trajectory cluster membership	- High school graduation/GED - College enrollment - Apprenticeship - Employment	OOHC re-entry between age 13 and 15
Answered RQ	RQ 1, 2	RQ 3	RQ 4

Note. Sample size was estimated using the Maryland child welfare administrative data that the PI has access to. The exact sample size will depend on the MLDS dataset.

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Table 2. Estimated sample size of each birth cohort and their age in a certain year

Birth year	Calendar year																	Estimated Sample size	Cumulative sample size
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		
2002	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	662	662
2003	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	629	1291
2004	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	645	1936
2005	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	688	2624
2006	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	689	3313
2007	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	692	4005
	The age range of the childhood trajectory (sequence)/School age range																		
n	age in a certain year of a birth cohort																		
n	Juvenile justice observation windows (age 10-17 in Maryland)																		

Measures

1. Child welfare OOHC measures include placement types, placement start dates and end dates, removal reasons, return reasons and permanency outcomes.
2. School mobility and performance measures include school enrollment status, timing of moves, chronic absenteeism, grade retention, special education status, dropout, and offenses.
3. Juvenile justice measures include justice system involvement (Complaint, Disposition, Placement), timing of each involvement, placement type, start dates and end dates of the placement.
4. Post-secondary education attainment measures include college/university enrollment status.
5. Apprenticeship measures include apprenticeship status and apprenticeship type.
6. Employment measures include employment status in Maryland and earnings in Maryland jobs subject to Unemployment Insurance.
7. Socio demographic information such as gender, race, ethnicity, grade level, eligibility for free/reduced price meals, etc. will also be used.
8. Aggregate community factors will include variables such as county poverty rate, criminal rate, unemployment rate, rurality, and child population, etc.

Analysis Plan

1. RQ 1: MCSA and Clustering

Sample: Whole sample (2002-2007)

a. Multi-Channel Sequence Construction

The study utilizes Multi-Channel Sequence Analysis (MCSA) to construct a holistic, longitudinal "life-course" for each child. By aligning cohorts by biological age rather than calendar year, the methodology integrates three distinct administrative channels—OOHC (placement changes and episodes), educational milestones (chronic absence, academic peril/grades, and grade advancement), and juvenile justice involvement (adjudication, probation, and detention episodes)—into a unified temporal framework spanning from age 6 through age 17. To capture rapid transitions across systems with high granularity, sequences will be tracked at an appropriate time resolution (e.g., quarterly or monthly). This method captures the specific timing, order, and duration of multi-system transitions for children who were first removed to OOHC since 2008, providing a comprehensive view of system-spanning trajectories starting from school age.

b. Typological Clustering

Following sequence construction, a global dissimilarity matrix will be calculated across the pooled cohorts using Dynamic Hamming Distance. Following distance matrix generation, person-centered clustering algorithms (e.g., Ward's Hierarchical Clustering) will be employed to group individual sequences into a manageable set of representative, distinct typologies (e.g., "Stable Educational Pathways" versus "High-Intensity System Involvement"). Several

empirical goodness-of-fit metrics will be used to evaluate the quality of the cluster number: the Average Silhouette Width (ASW), Hubert's Gamma (Γ), the point biserial correlation (PBC), and R2. In addition, Cluster stability will be quantified using the mean Jaccard similarity coefficient across bootstrap iterations. Lastly, the sequences in this study will be visualized using stacked state distribution plots and multi-channel sequence index plots.

2. RQ 2: Modeling Factors of Trajectory Membership

Sample: Whole sample (2002-2007)

Multilevel multinomial logistic regression modeling will be used to identify how individual-level demographics, birth cohorts, and community-level factors (such as county-level poverty or crime rates) are associated with the likelihood of a child following a specific multi-system trajectory cluster. Crucially, to leverage unobserved pre-2008 child welfare history for the older cohorts, historical placement spell numbers will be converted into an ordinal prior-history metric, and a binary left-censoring indicator will be included to statistically control for measurement gaps prior to the data start date. The county/region definition will be adhered to the MLDS suppression rules after assessing analytic sample size.

3. RQ 3: Modeling Outcomes of Trajectory Membership

Subsample: Young adult subsample (2002-2004)

Because outcomes must be tracked after age 18 within the available data window, this phase is restricted to the oldest cohorts. Multiple logistic regressions (or probit models) will be used to evaluate the longitudinal association between trajectory cluster memberships (entered as independent dummy variables) and specific young adult self-sufficiency markers observed between ages 20 and 22. These outcomes include high school graduation/GED, apprenticeship participation, college enrollment, and formal employment status. In addition, models predicting outcomes will be performed by demographic subgroups or using interaction terms as a sensitivity test to examine potential system disparities.

4. RQ4: Machine Learning and Predictive Risk Modeling (PRM):

Subsample: Re-entry subsample (2002-2007)

a. OOHC Re-entry Prediction and Model Comparison

This study integrates sequence analysis and predictive risk modeling to evaluate to what extent dynamic, life-course features improve the forecasting of OOHC re-entry. The outcome that we are predicting is whether a child is removed again to experience a second OOHC spell within two years of being discharged from their first OOHC spell to reunification and guardianship. This study compares transparent white-box models (e.g., Logistic Regression and Decision Trees) with high-performance black-box ensemble machine learning algorithms (e.g., Random Forest and XGBoost) to evaluate complex, non-linear patterns of OOHC re-entry risk. Model performance will be rigorously assessed on a 30% holdout testing set using AUC-ROC, Sensitivity/Recall, and Precision/Positive Predictive Value metrics, with particular optimization attention paid to class-imbalanced re-entry outcomes.

b. Predictive Fairness and Interpretability

To support ethical and policy-relevant implementation, model performance will be systematically evaluated across socio-demographic and regional subgroups—specifically by age, race/ethnicity, gender, and county jurisdiction.

How will this research benefit the State of Maryland in terms of state or local policy and/or practice?

This study benefits the State of Maryland with the following expected contribution:

1. Informing Cross-System Coordination and Resource Allocation

This study provides an integrated, exploratory view of how children move across child welfare, education, and juvenile justice systems over time. By identifying and characterizing common trajectory patterns, agencies such as Maryland Department of Human Services (DHS), Maryland State Department of Education (MSDE), and Maryland Department of Juvenile Services (DJS) can better understand how system involvement co-occurs and evolves. These evidence can inform more coordinated policy discussions and help assess whether current resources are aligned with the needs of youth experiencing complex, multi-system involvement.

2. Enhancing Educational and Workforce Equity

By examining how multi-system trajectories associated with later educational and employment outcomes (e.g., High school graduation/GED, post-secondary education, apprenticeship participation, and employment), this research moves beyond isolated risk factors to highlight how sequences of experiences shape opportunity. The findings will help identify key transition points—such as periods of school disruption or placement change—where supports may be most meaningful, contributing to ongoing efforts to reduce disparities for youth with out-of-home care experience.

3. Improving the Safety, Permanency, and Well-being Outcomes (CFSR)

Through the Children’s Bureau Child and Family Services Review (CFSR) round 4, Maryland has been identified as needing improvement in preventing OOHC re-entry (Children’s Bureau, 2025). This study contributes by exploring how re-entry patterns emerge across different system experiences and modeling approaches. Rather than focusing solely on prediction, it provides insight into the complexity and variability of re-entry pathways, helping agencies reflect on where prevention and family support efforts may be strengthened across systems, including in foster care, juvenile justice, and public schools.

4. Informing Evidence-Based Refinement of Out-of-Home Care

Maryland prioritizes placing children in stable, family-like settings, including kinship care. This study examines how placement trajectories unfold alongside educational and justice system involvement, offering a more nuanced understanding of stability over time. By incorporating educational continuity and outcomes alongside placement and justice trajectories, the findings can help assess whether current placement practices support coherent pathways toward permanency, and academic stability, or whether certain trajectory patterns indicate areas where additional support or policy refinement may be needed.

Reference:

Children’s Bureau (2025). Child and Family Service Reviews Maryland Final Report. Retrieved from <https://www.cfsrportal.acf.hhs.gov/document/download/EdvYzL>

Explain why this research requires longitudinal cross-sector data?

This study relies on the Maryland Longitudinal Data System (MLDS) because it seeks to explore how children’s experiences unfold across multiple public systems over time, rather than within any single domain.

1. Capturing Cross-System Trajectories

Children involved in OOHC often interact with education and juvenile justice systems in overlapping and sequential ways. Integrated data across child welfare (placements), education (enrollment), and juvenile justice (system involvement) are necessary to examine how these experiences co-occur and intersect. Single-sector datasets cannot reveal these interconnected patterns or the timing of transitions across systems.

2. Tracing Life-Course Development

This study adopts a life-course perspective to examine how sequences of childhood experiences relate to variation in young adulthood outcomes, including apprenticeship, postsecondary and career outcomes. Longitudinal data spanning from childhood (age 6) through young adulthood (age 22) make it possible to reconstruct these trajectories and observe how patterns evolve over time. With this temporal depth, it would be possible to identify how different pathways unfold or diverge.

Proposed Center Output

(Typical products for the MLDS Center include a research series presentation to stakeholders and a research brief in the MLDS Center template).

This project will be presented at the MLDS research series and we will draft a research brief.

Timeline for the proposed project (identify major deliverables and approximate dates)

	2026				2027	
	Spring	Summer	Fall	Winter	Spring	Summer
Application writing	X	X				
MLDS application		X				
Data cleaning			X			
Data analysis			X	X		
Presentation to stakeholders				X	X	
Incorporate feedback				X	X	
Further develop for dissertation				X	X	
Dissertation defense					X	X
Provide MLDS policy brief					X	X
Dissemination and Publication						X

Plans for further development (i.e. journal submission, etc)

This project will be further developed for a dissertation, peer reviewed manuscripts, and academic conference presentations.

Section 3. MLDS Center [Research Agenda](#)

Does your project relate to one of the following areas which the General Assembly has specifically directed the MLDS Center to study:	Yes	No
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Project Approval - Detailed Application

The impact of a State or federal education program? ¹	X	
The performance of educator preparation programs?		X
Best practices regarding classroom instruction?		X
The impact of child welfare programs on the educational and economic outcomes of students?	X	
An analysis of social determinants, provided by State agencies ² and appropriate local agencies, that impact education performance of students and indicate the need for wraparound services for students.	X	
Does your project use State or Federal financial aid ³ data?		X
If you are requesting to use FAFSA data please explain how this research will benefit the administration of Title IV federal financial aid.		
N/A		
Research Agenda Category (page 2 of the Research Agenda) – Which category does the project address? Please explain.		
This project aims to address two primary Research Agenda Categories within the MLDS Research Agenda: 1. Pathways & Pipelines The proposed study utilizes Multi-Channel Sequence Analysis (MCSA) to descriptively map the complex crossover trajectories between the child welfare, education, and juvenile justice sectors. By identifying the specific timing and frequency of the events, this research illuminates the pipeline through which foster youth transition into—or are diverted from—the justice system. Unlike cross-sectional reports that provide static snapshots, this longitudinal approach identifies the entry and exit points that define the educational pathways of Maryland’s most vulnerable students. This provides the MLDS with a holistic view of how system-level transitions (e.g., a placement change coinciding with a school move) associated with the pipeline to young adulthood outcome success. 2. Educational, Service & Workforce By including an earlier cohort, this study extends the observation window from childhood into early adulthood (up to age 22) by using records of 16 years (2008-2024). This allows for the rigorous investigation of young adulthood outcomes, including apprenticeship and employment status, as well as post-secondary education enrollment. The research evaluates how childhood trajectories—characterized by varying degrees of placement and school stability—serve as longitudinal predictors of economic self-sufficiency. This study aligns with the MLDS mission to understand long-term workforce participation and earnings of students in Maryland.		
Research Agenda Themes (page 2-3 of the Research Agenda) - Which cross cutting theme is incorporated in the project? Please explain.		

¹ All projects must relate to a state or federal education program. If you are not sure, please contact ross.goldstein@maryland.gov.

² State agencies include: Maryland Department of Health, Department of Human Services, and Department of Juvenile Services

³ Financial aid data derived from the FAFSA may only be used in research to improve the administration of federal financial aid programs.

This project integrates the following cross-cutting **themes from the MLDS Research Agenda**:

1. Supports and Barriers

The research explicitly models the interplay between system-level supports and structural barriers by treating OOHC placement stability, public school enrollments and mobility, and juvenile justice involvement as interconnected channels. By identifying the specific timing of transitions, the study uncovers administrative bottlenecks—such as when a child welfare placement change triggers a school move or a subsequent arrest. **Identifying the barriers can help to find and target supports to improve students' pathways to a successfully transitioning to adulthood, including high school completion, college enrollment, and apprenticeship and workforce participation.**

2. Social Determinants

The project treats childhood trajectories in OOHC, public schools, and juvenile justice involvement as a primary social determinant of health and economic well-being. By linking childhood trajectories to post-secondary education outcomes and workforce participation in young adulthood, the research assesses how environmental stability is related to young adult outcomes. This alignment provides a deeper understanding of how systemic instability in early life acts as a longitudinal predictor of socioeconomic exclusion, informing state policy to intervene in a timely manner.

3. Equity and Inclusion

Children in OOHC experience persistent educational and workforce inequities, with notable racial, ethnic, and gender disparities. This project examines trajectories by race/ethnicity and gender to identify disproportionate risks of juvenile justice crossover and uses predictive fairness analyses to ensure equitable early warning indicators. Findings will inform policies and supports aimed at improving equitable access to educational and labor market opportunities.

Section 4. Data and Cross Sector Analysis

Please review the MLDS Center [Data Inventory](#) and the MLDS Center [Data Gap Analysis](#) prior to completing this section.

Sectors* *The data falling within each sector is outlined below. The purpose of this section is to ensure the project is cross sector. Projects will not necessarily use all data elements within the sector (see methods section for definitions of measures).	X
Early Childhood Education Sector	X
K-12 Education Sector	X
Adult Education Sector	X
Justice Involved Youth Sector	X
Child Welfare Sector	X
Postsecondary Education Sector	X
Other Completions and Credentials Sector	
Workforce Sector	X

Put an 'x' next to each data sector your project will include. You must have at least 2 sectors.

Do you plan to request to include external data as part of your project?
N/A

*Sectors

Early Childhood Education Sector

- PreK Academic Engagement

K-12 Public School Education Sector

- Enrollment and attendance
- Assessments
- Courses and grades
- Completions
- Discipline
- Public School Characteristics

Adult Education Sector

- GED/NEDP Exam Results
- Apprenticeship
- Adult Education
- Correction Education

Juvenile Justice Sector

- Juvenile Justice Records
- Juvenile Education Records

Child Welfare Sector

- Out-of-Home Placements

Postsecondary Education Sector

- College and University Enrollment
- College and University Courses, Credits and Grades
- College and University Degrees
- College and University Workforce Training
- Financial Aid

Other Completions and Credentials Sector

- Industry Certifications
- Licenses

Workforce Sector

- Public School Teachers
- Public School Staff
- Workforce visibility/participation
- Workforce Earnings
- Workforce Industry

Section 5. Financial Information

The MLDS Center incurs costs for every project related to: (a) IT support and infrastructure; (b) assistance from subject matter experts, (c) criminal history background checks; and (d) creation of an analytic data set. Average project costs are between \$1,000 and \$3,000. A detailed, customized estimate will be provided prior to project initiation. (Please indicate your answer with an "X")							
<table border="1"> <tr> <td>☐</td> <td>I will reimburse MLDSC for all applicable fees.</td> </tr> <tr> <td>☐</td> <td>I will only be able to provide partial reimbursement.</td> </tr> <tr> <td>X</td> <td>I will need a waiver.</td> </tr> </table>	☐	I will reimburse MLDSC for all applicable fees.	☐	I will only be able to provide partial reimbursement.	X	I will need a waiver.	
☐	I will reimburse MLDSC for all applicable fees.						
☐	I will only be able to provide partial reimbursement.						
X	I will need a waiver.						
Grant Funding (indicate with an 'X')							
<table border="1"> <tr> <td>☐</td> <td>This project has already received funding</td> </tr> <tr> <td>X</td> <td>I plan to apply or am in the process of applying for grant funding</td> </tr> <tr> <td>☐</td> <td>No grant funding is planned</td> </tr> </table>	☐	This project has already received funding	X	I plan to apply or am in the process of applying for grant funding	☐	No grant funding is planned	
☐	This project has already received funding						
X	I plan to apply or am in the process of applying for grant funding						
☐	No grant funding is planned						
Name of Grantor							
I plan to apply for the below grants: MPower Early Scholars Investment Fund Grantor: MPower PhD Program Dissertation Grants Grantor: University of Maryland School of Social Work Academia Sinica Fellowships for Doctoral Candidates in the Humanities and Social Sciences Grantor: Academia Sinica, Taiwan							
RFP or Grant Program Information (you may provide a link to the grantor's website)							
MPower Early Scholars Investment Fund (MPower) is a collaboration between the University of Maryland, Baltimore (UMB) and the University of Maryland, College Park (UMCP). MPower has launched the MPower Early Scholars Investment Fund designed to support PhD Students, Postdoctoral fellows, and Junior Faculty. - Website: https://www.umaryland.edu/provost/mpower-early-scholars-investment-fund/ PhD Program Dissertation Grants The University of Maryland School of Social Work PhD Program offer a limited number of internal grant awards for PhD candidates to conduct their dissertation. - Website: https://www.ssw.umaryland.edu/admissions/phd-admissions/funding-and-financial-support/ Academia Sinica Fellowships for Doctoral Candidates in the Humanities and Social Sciences Academia Sinica (AS) wishes to cultivate talents working in the Humanities and Social Sciences, to assist Taiwanese doctoral candidates to complete their dissertations, and to build up a reserve of talents for AS institutes. These guidelines are established to promote this end. - Website: https://www.sinica.edu.tw/en/cp/332 Program information (English version):							

Project Approval - Detailed Application

https://file.apps.sinica.edu.tw/filepool/asweb/file/2023/2011MD7rgagelFqfDqj4CWFO/Academia%20Sinica%20Fellowships%20for%20Doctoral%20Candidates%20in%20the%20Humanities%20and%20Social%20Sciences.pdf
Amount of grant funds sought or awarded.
1. MPower Early Scholars Investment Fund Amount of grant: Up to USD \$32,500 2. PhD Program Dissertation Grants Amount of grant: USD \$4,000 3. Academia Sinica Fellowships for Doctoral Candidates in the Humanities and Social Science Amount of grant: NTD \$600,000 (approximately equivalent to USD \$21,090)
Grant Application Date
1. MPower Early Scholars Investment Fund Due date: TBD, September 1st 2026 2. PhD Program Dissertation Grants Due date: June 1st or October 1st 2026 3. Academia Sinica Fellowships for Doctoral Candidates in the Humanities and Social Sciences Due date: TBD, Possible in February or March 2027
Do you intend to proceed without grant funding?
Yes.
Are you receiving other funding for this proposed project? If yes, how much?
No.

Section 6. Special Considerations

Principal Investigators NOT affiliated with a Maryland College or University – please provide information on: a. Your familiarity with Maryland policies affecting your research topic; and b. How your project meets a specific Maryland research need? Please also upload (with this form) any letters of reference or endorsement from a Maryland researcher or a State or local agency that vouches for your qualifications and expertise.
N/A
For projects that involve a small population, please confirm that you are aware of the MLDS Center’s data suppression policy and explain how you will report your findings while conforming to the suppression requirements.
N/A
For projects that involve a single school system, university, or program, please explain the statewide implications of the project. Please also upload (with this form) any letters of support from the subject (i.e. school system or university) of the study.
N/A

Section 7. Project Team

Project Team - Please list all members of the research team and indicate roles and responsibilities. - If the Principal Investigator listed in Section 1 above is NOT the primary point of contact for the project (including research, data access, and presentations to stakeholders), please indicate which team member is the primary point of contact and provide that individual's contact information.		
Name and Organization	Role	Is system access needed? (Yes/No)
Meng-Hsuan Yu, University of Maryland School of Social Work	Primary Investigator	Yes
Roderick A. Rose, Ph.D., University of Maryland School of Social Work	Dissertation Advisor	Yes
Angela Henneberger, Ph.D., University of Maryland School of Social Work	Dissertation Committee member	Yes, Already has it
Terry V. Shaw, Ph.D., University of Maryland School of Social Work	Dissertation Committee member	Yes, Already has it
Haksoon, Ahn, Ph.D., University of Maryland School of Social Work	Dissertation Committee member	No
Eunhye Ahn, Ph.D., Brown School at Washington University in St. Louis	Dissertation Committee member	No

Section 8. Submission

Once this form is completed, please complete the online application ([here](#)) and upload this form, CVs for all members of the research team, and any other supporting materials.