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Identification of Effective Strategies to Disrupt Recruitment of Victims in Human Trafficking: Qualitative Data, Systems Modeling, Survivors, and Law Enforcement

Final Technical Report

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Introduction

Purpose and Goals

Recruitment of victims into operations that traffic people for the purpose of sexual exploitation (herein referred to as “sex trafficking”) is a critical, yet not well-understood, aspect of human trafficking (Martin et al., 2023). Trafficking could not happen without successfully recruiting and obtaining of victims, including the *initial* recruitment phase. Thus, the recruitment process is an essential function of a trafficking operation. Research on recruitment in sex trafficking has primarily focused on individual and interpersonal dynamics between traffickers and victims (Farrell and de Vries, 2019). There is a robust body of literature describing and documenting violence, manipulation and force throughout the duration of a sex trafficking experience, but few studies differentiate when in the trafficking process these experiences occurred (Martin et al., 2023; Kulig & Cullen, 2021; Baird & Connolly, 2023). This literature is typically derived from the perspective of individuals who have been victimized in sex trafficking. There is a significant lack of data collected directly from traffickers about their motivations and actions, including in the initial stages of recruitment of victims (Barrick et al., 2023). Although there is an abundance of research on broad tactics used in both recruitment and maintenance of victims in an operation, there is sparse evidence describing *initial* recruitment strategies and how these mechanisms line up with particular victim characteristics (Martin et al., 2023).

Cutting-edge approaches to modeling trafficking operations have used social network analysis (Cockbain, 2018; Denton, 2016) while other research has attempted visualizations to depict trafficking networks and operational structures (Martin et al., 2014). Systems and mathematical modeling offer the potential for new ways of understanding trafficking operations – including recruitment (Dimas et al., 2022a; Martin et al., 2022; Sharkey et al., 2021; Caulkins et al., 2019; Konrad et al., 2017). Recent advances in the use of operations research and computational modeling have yielded new and promising approaches to understanding trafficking networks, supply chains, and decision-making about potentially effective disruptions and resource allocation (Dimas et al., 2022a; Dimas et al., 2022b; Tezcan & Maass, 2023; Kosmas et al., 2023; Kosmas et al., 2024; Kosmas et al., 2022; Ray et al., 2024). Computational modeling requires empirical data at numerous stages of the modeling process (Sharkey et al., 2021). Unfortunately, these data are sparse or nonexistent given that human trafficking is hidden, illegal, and dangerous, and therefore challenging to research. For example, there is a dearth of longitudinal studies of trafficking experiences over time, representative samples of victims and their experiences, and other types of rigorous research. Similarly, we lack scientific and empirical understanding of the complex movement of potential victims in and out trafficking situations based on different characteristics and in response or relation to different types of intervention and disruption.

This project used an innovative, transdisciplinary, and mixed methods approach to gather evidence about recruitment of victims into sex trafficking in order to develop conceptual and analytic models. Our goal was to illuminate and understand the complex pathways of recruitment and re-recruitment, interventions and their cascading outcomes on recruitment into trafficking operations, the implications for victim wellbeing, and effects on broader society. The transdisciplinary team included researchers (engineering/operations research, social sciences, public health, and public policy) and a sex trafficking survivor-centered advisory group. The process of building a transdisciplinary team requires close attention to building trust, shared language, and common purpose (Martin et al., 2022). Our approach to data collection and

computational modeling included key insights from the lived expertise of our survivor-centered advisory group (Sharkey et al., 2021).

This study focused on the state of Minnesota because our approach was new and exploratory. We wanted to develop our methods and approach within the context of one state to reduce logistical barriers and see if models worked. We believe that our transdisciplinary process and our findings can be replicated in other contexts with targeted community engagement and localized data collection. Our novel and comprehensive approach contributes to an existing evidence base to better conceptualize recruitment, guide prevention of recruitment, and identify strategies that disrupt, rather than displace, recruitment networks and activities.

Research Questions

The project sought to answer four research questions and goals displayed in Table 1.

Table 1. Research questions and project goals

Research Questions	Project Goals
(1) How are recruitment networks <i>structured</i> in operations of trafficking for sexual exploitation?	(A) Close a significant gap in knowledge about the <i>structure and function</i> of recruitment networks and tactics in sex trafficking operations.
(2) How do recruitment networks <i>function</i> within the overall sex trafficking operation, including concomitant labor trafficking committed by the operation?	
(3) Do recruitment networks offer the potential for <i>effective intervention</i> and interdiction to disrupt sex trafficking operations? If so, how can we create mathematical models to capture the cascading impacts that disrupting recruitment may have across the operation?	(B) Identify shared objectives for interventions across diverse stakeholders to identify potentially <i>effective interventions</i> . (C) Model potentially <i>effective intervention</i> opportunities to disrupt, not simply displace, recruitment networks and tactics.
(4) What are the <i>unintended consequences</i> and <i>ethical</i> implications of disrupting recruitment networks? Can mathematical models capture these unintended consequences?	(D) Surface <i>ethical</i> considerations and <i>unintended consequences</i> of any disruption or interdiction.

About this Report

This technical report has three primary sections. The methods section describes how we conducted qualitative, quantitative, and computational research using a mixed-methods approach. Then, the results section describes key findings organized according to the research questions listed in Table 1. Finally, the report concludes with key implications arising from this research project. The appendices include references, products, and publications from this grant, a list of key personnel and their roles, the semi-structured interview consent form and interview guide, an overview of the math underlying the computational model and analysis, and results from quantitative research.

A Note on Language

As is well known in the field, there is a lack of agreement on some of the basic terms and concepts related to transactional sex and trafficking. Terminology varies across studies and is often imprecise (Russell, 2018; Weitzer, 2020; Zhang, 2009; NASEM, 2020). Some usage of terms conflates experiences across a spectrum of exploitation (Fedina et al., 2017). We want to be clear and precise in how we use and define terms and concepts in this report. We use the term “sex trading” as an umbrella term to refer to the exchange or sale of sex or sexual activity for something of value. This term encompasses the full spectrum of experiences in transactional sex including trafficking, exploitation, and voluntary engagement.

We use the term “sex trafficking” to refer to human trafficking for sexual exploitation as described by the United States Trafficking Victim Protection Act (TVPA); defined as recruiting, transporting, transferring, harboring, or receiving people through force, fraud, or deception, with the aim of sexually exploiting them for profit. Third-party facilitation is an essential component of the legal definition of trafficking in relation to adults. However, for minors, U.S. law defines any inducement of a minor to perform a commercial sex act as sex trafficking regardless of third-party facilitation (US Government, 2000). Minnesota state statutes view sex trafficking as “receiving, recruiting, enticing, harboring, providing, or obtaining by any means an individual to aid in the prostitution of the individual; or receiving profit or anything of value” (BCA, 2023). Minnesota’s Safe Harbor law decriminalizes youth who trade sex and views them as victims of sexual exploitation. Safe Harbor created a statewide network of funded services and supports for youth up to age 24 who are victims of sexual exploitation (MDH, 2023).

The focus of this research is recruitment into operations that traffic individuals for sexual exploitation, with a secondary focus on minors engaged in sex trading (which the TVPA defines as sex trafficking). The findings of this report do not purport to encompass all forms of transactional sex. In this report, the term “victim” refers to a person who is actively being victimized in sex trafficking. We acknowledge that victimization does not encompass a person’s full identity. Some people whose experience in commercial sex meets the definition of trafficking may not identify with the term “victim.” We recognize the right of individuals to choose for themselves how they wish to identify. When a person has been formerly victimized in sex trafficking, we use the term “survivor.”

It is typical in the field to use the term “vulnerability” to describe factors associated or causal to involvement in sex trading or sex trafficking (e.g., Franchino-Olsen, 2021). The term vulnerability typically denotes factors associated with individuals. In this report, we use the term “susceptibility” rather than vulnerability to describe a person’s risk of being trafficked. We believe this term appropriately locates risk for sex trafficking within broader structures rather than individual characteristics. This view also aligns more closely with our computational modeling approach.

Methods

The methods section describes the project's transdisciplinary and mixed methods approach, including data collection, analysis, and triangulation. The first section describes our research approach. This study had two parts: qualitative data collection and computational modeling (including the quantitative data needed to run the model). The second section describes our qualitative data collection, which included a systematic literature review (Martin et al., 2023), key informant interviews (N=31), and review of comprehensive law enforcement case files (N=4).

The third section provides an overview of our computational approach. Computational modeling may not be familiar to readers outside of operations research and engineering. Consequently, we aim to introduce our approach in lay terms before diving into the technical specifications and data collection. We follow the principle that all models are wrong, but some are useful (Sharkey et al., 2021); a concept often attributed to George Box. In order for a model to be useful, the assumptions and premises of the underlying mathematical formulas must be based on accurate empirical data. For this study, we applied a standard operations research model called the Markov Chain (Hillier & Lieberman, 2021). This class of models is used to understand the probability (or likelihood) of a phenomenon transitioning from one state to another. For example, we could develop a Markov Chain to model transitional probabilities of weather conditions changing from sun, to rain, to clouds, to fog. In such a model, the states associated with different weather conditions could be based on scientific understanding of weather conditions, and past weather data could be used to predict future transition probabilities between states.

In this study, we developed a Markov Chain to model pathways and transition probabilities of individuals as they move between different states associated with risk of experiencing sex trafficking (including sex trading among youth). The model takes into account that not everyone who is susceptible to recruitment will end up experiencing sex trafficking. A Markov Chain model requires empirical data at two stages: (1) to develop the model (i.e., guide precise characterization of the states and enumeration of the transition pathways), and (2) to establish transition probabilities between states (including the probability of sex trafficking or trading). In section three, we provide technical detail on the Markov Chain model and describe our approach to identifying data for stages one and two. The methods and results related to the Markov Chain model are in direct response to our third research question. This novel approach to understanding susceptibility to recruitment is a potentially fruitful way to identify opportunities to prevent sex trafficking (and re-trafficking).

Research Approach

Transdisciplinary Research

This project used a transdisciplinary approach to team science (National Academies, 2015) that seeks to integrate and synthesize knowledge across academic disciplines and lived expertise (Lotrecchiano & Misra, 2018). This approach requires close attention and time to build the team through trust, respect, vulnerability, and recognition of multiple forms of expertise (Martin et al., 2022), which we began during a previous project completed by the team. Trafficking is complex, variable, illegal, hidden, stigmatized, and dangerous. Thus, much of the knowledge needed to understand how recruitment networks are structured and how they function is poorly understood. There is little clear empirical evidence about the motivations and strategies of traffickers and the details of recruitment (Barrick et al., forthcoming; Martin et al., 2023). A

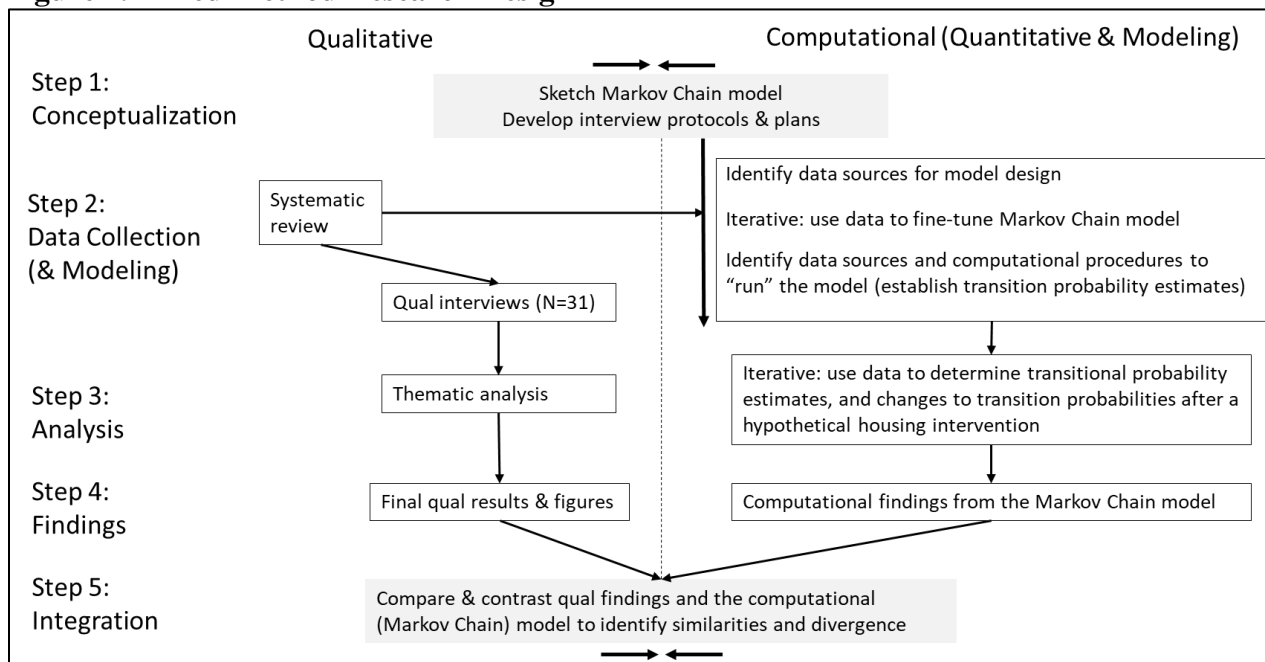
transdisciplinary approach is therefore necessary to overcome the significant data challenges inherent in research on trafficking to develop computational models (Sharkey et al., 2021).

The project team consisted of 19 people, including qualitative researchers (anthropology, criminology, public health, and public policy), engineers and operations researchers, and a survivor-centered advisory group. A full list of team members and roles is provided in Appendix 3. The survivor-centered advisory group was composed of five people including those with lived expertise and deep social service experience working with people victimized in trafficking. Members of the advisory group have a combined expertise of more than 90 years of experience in the field. Each advisory group member is knowledgeable about the experiences of hundreds of victims of trafficking. The advisory group contributed to project direction, guided model development, supported analysis, reviewed findings, and provided key insights to fill data gaps. A transdisciplinary approach, including close collaboration with lived experts, offers a creative and innovative way to approximate the hidden data for modeling purposes.

Mixed Methods Research Design

Within the transdisciplinary approach, this study used an emergent, concurrent mixed methods design to gather and triangulate qualitative research, computational modeling assumptions and decisions, and quantitative data needed to populate the computational model (Markov Chain). Below, Figure 1 shows the design using a variation of the notation system suggested by Creswell and Plano Clark (2018).

Figure 1. Mixed Method Research Design



NOTE: Diagram based on notational guidance for mixed methods research provided in Creswell and Plano Clark (2018). The study also collected data from comprehensive, law enforcement case files, which were not used in this analysis.

Figure 1 depicts how we developed two independent tracks – qualitative and computational – for data collection, analysis, and visualization of findings. It was necessary to diversify sources of data within each track because grounded information about recruitment into

sex trafficking operations is not neatly contained within any one data source. This study combined and triangulated multiple and distinct sources of information across the qualitative and computational tracks. To collect qualitative data, we conducted a systematic literature review (Martin et al., 2023) and qualitative interviews (N=30 with 31 interviewees). These sources helped answer the research questions and provide data and insights to develop the Markov Chain model. To develop and run the Markov Chain model we conducted a targeted search of the extant literature to attempt to identify salient quantitative data and we analyzed quantitative data from the Minnesota Student Survey (MSS). The survivor-centered advisory group guided and supplemented analysis of these data sources, but we do not consider their input as a data source, as they were part of the analytic team.

Figure 1 shows how we integrated findings at the beginning and the end of the process to achieve the “mixing” of data sources that is the hallmark of mixed methods research (Creswell and Plano Clark, 2018). We then triangulated these data to home in on key features of recruitment into sex trafficking to distill data points to guide and support mathematical modeling, as well as to understand the process and outcomes of recruitment into trafficking from two distinct vantage points.

Qualitative Data Collection

Systematic Review of Literature on Sex Trafficking Recruitment

We conducted a systematic review of peer-reviewed publications on recruitment into sex trafficking operations to identify what is known, highlight gaps, and provide a foundation for our work on this project (Martin et al., 2023). The review was registered with PROSPERO (registration # 260570), and we followed all PRISMA guidelines. We included articles from 2000 to 2021 in English with no restriction on geographic area. A full description of the methods and results of the systematic review are published elsewhere (Martin et al., 2023). Here we provide an overview.

We searched titles, abstracts, and key words within six databases, using the search terms “sex trafficking,” “prostitution,” “human trafficking,” “sex work,” “pimp*,” and “recruit*.” The “*” indicates root terms that would search all words with that root (e.g., pimp* = pimps, pimping, etc.). We used a 2-stage review process. The first stage identified 5,526 articles in the initial search. We removed 1,670 duplicates. We screened the titles and abstracts for the remaining 3,856 to identify articles that meet all three of the following criteria: (1) empirical study with clearly defined methods; (2) included detailed description of recruitment; and (3) data were collected from participants possessing first-hand knowledge of sex trafficking. This screening process yielded 340 articles for full text review. After the full text review, only 122 met stage one criteria. We conducted a second stage screening process to exclude articles that: (a) only described situational or contextual circumstances that contributed to being trafficked (e.g., poverty); and (b) did not provide sufficient detail about a recruiter, the victims, or the process of recruitment. All decisions were reviewed by two or more team members at each stage. We also conducted a hand search of bibliographies. The 2-stage screening process yielded 33 articles with one more added from the hand search. The final sample included 34 articles.

To analyze the content of each article we developed a survey to gather information about: (1) study characteristics and methods; (2) presence or absence of specific information on strategies of recruitment; and (3) answers to open-ended text fields to capture what the article said about recruitment. Specific data fields are described elsewhere (Martin et al., 2023). All data

captured from the articles were reviewed and confirmed by a second team member to verify accuracy and check for completeness.

We also subjected all 34 articles to a quality assessment per PROSPERO requirements for systematic reviews. For qualitative studies (N=32) we used the Critical Appraisal Skills Programme (CASP) (CASP, 2018), and for quantitative studies we used the Quality Assessment Tool for Quantitative Studies from the Effective Public Health Practice Project (Ciliska et al., 2022). Findings from the systematic review are shared throughout this report in relation to specific findings from the other methods.

Key Informant Interviews

The primary source of qualitative data for this project was key informant interviews. We used a purposeful sampling strategy to conduct semi-structured interviews with stakeholders across Minnesota (N=31). The intent of these interviews was to gather network-related information about sex trafficking recruitment and to support Markov Chain model development, while also providing a supportive interview experience for participants. The interview guide was iteratively developed through successive reviews by the whole transdisciplinary team. We also pilot tested the interview guide with the survivor-centered advisory group to make sure the questions made sense and were answerable. In particular, we made sure question wording was sensitive to anyone with lived experience who participated in an interview.

Interviews took place between June and October 2022. We invited participants through an email with a project overview and the consent form attached. We then answered questions via email, phone, or zoom as requested. We received a waiver of signed consent for this project since the signed consent form would be the only identifying information. Prior to the interview, we asked participants to indicate consent to be interviewed and consent to record the interview checking a box on the consent form. All interviews were conducted online using the University of Minnesota's Zoom account, which is HIPAA compliant. Interviews began with a review of the consent form with verbal consent. We provided a \$75 gift card to any interviewee who self-identified as a person with lived experience in trafficking as an expression of gratitude and compensation for their time.

Interview recordings were transcribed verbatim using automated software (Otter.ai website). A member of the research team checked the transcripts by listening to the recordings to confirm transcript accuracy. We then thematically coded interview data and de-identified all transcripts in preparation for archiving in the National Archive of Criminal Justice Data. The full protocol was approved by the University of Minnesota's IRB. The semi-structured interview guide and project consent form is in Appendix 4.

Sampling Strategy

There is limited empirical evidence on the initial recruitment process; thus, we used a purposeful sampling strategy. As is typical in purposeful sampling, we developed a comprehensive grid of sources of expertise and content attributes that we used to identify and invite potential interviewees within each category. This grid was updated as interviews surfaced new information. We tracked progress to identify gaps and iteratively course-corrected to recruit individuals within missing or under-represented categories. A full list of categories with transcript numbers is provided in Tables 2 and 3, below.

The qualitative research team created an initial list through conversations with individuals who coordinate statewide anti-trafficking efforts in Minnesota, staff members of government entities who implement anti-trafficking efforts, and asking interviewees and people who declined for referrals. We contacted over 60 individuals and agencies from the list of potential interviewees. Only a few of our initial contacts did not respond at all to an interview request. Most of those who replied and declined an interview stated that they did so for the following reasons: (a) they did not feel they had sufficient knowledge about recruitment into sex trafficking (most were more knowledgeable about ongoing exploitation); (b) they did not have time; or (c) they did not feel comfortable doing an interview (details provided in the section below entitled, “barriers to interview participation”).

We did not systematically collect demographic information on participants. However, most participants self-disclosed their gender and race or ethnicity. The majority of our sample were white (N=20) and female. Of those who self-identified a race or ethnicity, 35% identified as a person of color, including black (N=6), Native (N=4), and Latina (N=1). None of the interviewees self-identified as being transgender or gender diverse. Most participants indicated that they were knowledgeable about the trafficking experiences of black, indigenous and people of color (BIPOC) as well as lesbian, gay, transgender, and queer populations, especially youth. Participants who identified as BIPOC were more likely to provide additional detail and context about the ways that sexual exploitation and trafficking impacts individuals within their racial and ethnic communities.

Table 2. Source of expertise

Source	Number of transcripts
Lived expertise	7
Law enforcement	7
Prosecutor’s office	3
Service provider	19

NOTE: this does not add up to 31 because several individuals indicated more than one source of expertise.

Table 3. Content attributes of interview transcripts

Content detail	Number of transcripts
<i>Operation Description</i>	
Familial	18
Small-scale	24
Gang	5
Massage parlor	10
Trap/crack house	1
Brothel	3
Peer	10
Sugaring	3

<i>Operation Scale</i>	
International	7
National	5
Minnesota	33
<i>Legal Sex Industry</i>	8
<i>Geography</i>	
Across all of MN	5
Twin Cities Metro	17
Northern MN	5
Southern MN	8
Central MN	2
MN Border State	2
West Coast State	3
<i>Race and Ethnicity of People Involved in Trafficking</i>	
Black	10
Native	12
White	6
Latina/o/x	5
Asian American Pacific Islander	8
Biracial or multiple races	4
<i>Immigrant Community Involved in Trafficking</i>	5
<i>LGBQ Community Involved in Trafficking</i>	9
<i>Transgender People Involved in Trafficking</i>	4
<i>Youth Victims of Trafficking</i>	26
<i>Adult Victims of Trafficking</i>	14

NOTE: we developed the transcript counts using a quantitative content analysis. This does not add up to 31 because interviewees described multiple content areas.

A key component of purposeful sampling is to track and assess for saturation of content across categories. We did this through a continual review of interview content to determine if we were learning new information within each source of expertise and content attribute. We did reach saturation in many areas, meaning that interviewees provided the same or similar content and we stopped learning new things from new interviewees. However, there are some areas where saturation was not met. Saturation results are provided for source of expertise and select content categories in Table 4.

Table 4. Saturation by source of expertise and content attribute category

Source of Expertise	Saturation
Lived experience expert	Yes
Law enforcement	Yes
Service provider	Yes
Northern MN	Yes
Central MN	Yes
Southern MN	Yes
Rural	Yes
Urban	Yes
Suburban	Yes
Content Attribute	
White	Somewhat
Black	Somewhat
Indigenous, Native	Somewhat
Asian	No
Latina/o/x	No
Transgender and gender non-conforming	No
Cisgender female	Yes
Cisgender male	No
Migrant, refugee, undocumented	No
Small-scale trafficking	Yes
Large-scale trafficking	Somewhat

Barriers to Interview Participation

Listed below are significant barriers faced when recruiting participants for this study.

1. The ongoing impact of the Covid-19 pandemic has significantly stressed social service and community-based agencies. People we contacted reported an increased number of people in crisis and seeking services, as well as increases in the number of people trading sex. This made it very difficult for key social service and housing providers to participate.
2. Interviews took place in an environment of cumulative collective trauma and mistrust of law enforcement related to high-profile police killings of people of color in Minnesota and the United States.
3. The initial recruitment information and consent form clearly stated our funding from the National Institute of Justice and that we would need to archive transcripts from interviews. Some potential participants, including service providers and law enforcement, expressed discomfort with archiving their interview transcript and chose not to participate because of it.
4. A pervasive anti-immigrant climate in the United States affected our ability to recruit stakeholders who work with immigrant, refugee, and undocumented populations. Not a single person with specific expertise or direct connection with migrant, immigrant, or undocumented populations agreed to participate in an interview. Some said that they did

not know about recruitment, but most indicated discomfort with participating in the project. This has not been the case for our past research. The funding source and archiving requirement seemed to be a particular barrier for this group of potential interviewees.

Interview Approach

Stakeholders know about sex trafficking from a variety of sources, including lived experience, work experience, training, reading, and conversation with other stakeholders. The goal was to gather knowledge from direct experience. We took several steps to help participants identify the sources of their knowledge. The opening question asked participants about how they know about sex trafficking to ground them in their own experience. We asked them to avoid sharing information solely based on trainings and to tell us when this was the source of information they provided. For the final transcript, we redacted any identifiable information from this section of the interview transcript and replaced it with generic descriptors as needed to preserve confidentiality. We then asked interviewees to describe the specific types of trafficking experiences or operations they had encountered. Based on that we asked about recruitment in those specific types. The interviewer then followed the participant's lead based on their experience and interest; circling back to make sure we covered all the domains.

Many of the questions in our semi-structured interview template prompted interviewees to explore their knowledge in new ways and it became clear that most participants were not accustomed to thinking about trafficking situations as abstract structures or networks. Interviewees were more used to thinking about trafficking through the lens of victim experiences rather than the tactics of traffickers. Because we sought information about recruitment into sex trafficking operations, we told interviewees that we were seeking information about the behaviors of third parties (e.g., traffickers, pimps, associates) to the commercial sex act. Thus, we provided explanations and clarifications, as needed, while we asked questions. We also restated what we heard to validate what interviewees were saying. Similarly, we proposed themes and content we heard in earlier interviews with later interviewees to crosscheck and validate to determine if we were reaching saturation on any particular areas. Some transcripts, and portions of transcripts, are conversational and do not strictly conform to a question-and-answer structure.

The interview process began with all three interviewers participating in the first two interviews to establish a similarity of interview style and approach. We then debriefed and split into teams for the first ten interviews, discussing themes and outcomes. After that, interviews were conducted by individual interviewers.

Thematic Analysis of Interviews

We conducted an iterative and cyclical thematic analysis (Saldana, 2016) that was augmented by a six-phase process for establishing trustworthiness described by Nowell et al. (2017). The interviews were coded using NVivo (2022, Release 1.6.1-1137). First, all the interviewers participated in the coding process and we began by immersing ourselves in the data by reading all the interview transcripts as they were conducted. We each kept memos to document emergent themes. Second, we generated an initial coding schema based on the interview data and the project research questions. Discussions about the identified themes and underlying answers to our research questions contributed to the development of a preliminary codebook. Next, we uploaded these transcripts into two separate NVivo qualitative coding

software projects. This allowed two research team members to review transcripts separately prior to combining our identified codes.

Third, we continued to iteratively develop and refine the codebook. Each member of the interview team coded the same two interviews to test and rework the codebook, journaling and taking note of text passages that did not fit. We then debriefed and revised the coding framework. In this process, we added additional transcripts and iterated multiple versions of the codebook looking to identify and hone themes. We also diagrammed relationships between codes (this formed the basis for figures included in the results). This process continued until the codes were internally coherent, well-defined, and supported by exemplar quotes. Two members of the interview team used this codebook to code all the transcripts. A primary coder was assigned to each transcript. Another team member reviewed all coding decisions. When a coder encountered content that did not neatly fit within the coding framework, that portion of the transcript was flagged for full team review to resolve. After all the transcripts were coded, the interview team organized and identified overarching themes and their meaning. To identify additional themes and describe findings within each code, we analyzed the transcript content within each code through a series of analytic memos. The coding team reviewed and debriefed this content.

Fourth, we prepared an overview of the codebook, themes, exemplar quotes, and code relationship diagrams for review by the entire transdisciplinary team at an in-person, all-day retreat. The entire coding schema was reviewed by the operations researchers and the survivor-centered advisory group. Fifth, based on this review, we further defined the themes and finalized a visual depiction of the data that was reviewed several times by the full team. Based on this input we streamlined the findings by combining some themes and deconstructing others. This exercise helped finalize the diagrams to summarize and display findings. We invited the survivor-centered advisory group to help us analyze this content and assess the diagrams. Then we used these themes and findings to answer the research questions listed above. Finally, we wrote up relevant findings in this technical report. All results were reviewed by the entire team prior to completion of the report.

Comprehensive Case Files held by the Minnesota Bureau of Criminal Apprehension

Ultimately, the comprehensive case files held by the Minnesota Bureau of Criminal Apprehension (BCA) did not provide sufficient information for inclusion in the findings, but we describe it here because it was part of the grant proposal and funding. The University of Minnesota team acquired access to four comprehensive law enforcement case files related to sex trafficking prosecutions through a Joint Powers Agreement (JPA) between the University of Minnesota and the BCA that went into effect on January 1, 2021. Comprehensive case files contain the documents used and produced by law enforcement personnel in the course of conducting their investigation, including numerous support and background documents. Thus, they contain more information than what is included in publicly available trial records. These case files were voluminous, containing images, lists of seized evidence, investigative notes, background checks, interview transcripts, and more. The sole purpose of case file review was to understand generalized network structures, features, functions, and “rules” of operation. The data sharing agreement did not permit identification and sharing of identifiable information pertaining to individuals in the case file.

The JPA specified the following procedures for access and use of this data. BCA staff put electronic copies of case files onto a desktop stored in the BCA office complex. UMN staff accessed these case files through a BCA supported VPN to the remote desktop. The BCA

supplied a two-factor authentication procedure to provide appropriate security. Four team members from the UMN submitted to an extensive background check and completed security training in order to access confidential BCA files. The data was password protected at both the VPN and the desktop. The UMN team was prohibited from downloading, printing, or taking notes outside of the secure desktop. We conducted all data review, extraction, and analysis within this secure BCA remote desktop. BCA staff including investigators and data practices lawyers reviewed the collected data prior to removal from the secure desktop to assure they were sufficiently anonymized in accordance with Minnesota Data Practices requirements. After that, a BCA data practices lawyer was allowed to remove our final data products and email them to the research team for inclusion in the study.

Our initial analytic plan was to abstract de-identified node and arc data to reconstruct generic recruitment networks. The abstracted models would consist of nodes (generalized and de-identified people, places, and things) and arcs (connections between nodes) and how they form networks. We developed data files and procedures to attempt this. However, it proved both extremely onerous and it did not yield a great deal of actionable information for the purposes of this project. The number of cases is small. With this procedure, it was very difficult to anonymize this kind of information. We determined that our initial plan for data collection from this source was not feasible or useful for modeling purposes related to recruitment. Instead, our team pulled qualitative information from cases to help identify and describe a series of empirically-based “assumptions” or “rules” about how recruitment networks function. This information was used to inform model parameters. We compiled this information in an analytic memo for each case file.

Additionally, and most importantly for this study, case files did not include content rich data about initiation of recruitment or the recruitment process in general. Investigators focused on different aspects of the trafficking experience in line with proving the crime as defined in Minnesota statute. This makes intuitive sense given the Minnesota statutes related to trafficking. According to Minnesota statute, a potential sex trafficking situation becomes a trafficking situation when a third party compels or profits from a sex act. The initial recruitment happens before the first commercial sex act occurs. Thus, according to Minnesota statute, recruitment activities happen before the crime of trafficking has been committed. Gathering documentation of initial recruitment is not necessarily useful in proving a trafficking case. Given this, this data source did not yield substantial information in answer to the project’s primary research questions. Therefore, we do not include data from this source in the results section because it did not contribute to answering our research questions.

The primary finding from our BCA case file review is that this data source does not appear to be a content-rich source of data on recruitment. This highlights the limitations of law enforcement data for understanding recruitment into human trafficking. Many interview participants also noted that law enforcement and prosecution personnel might not be in a good position to uncover information about the initial recruitment process. We explore this important theme from our qualitative interviews in a separate manuscript for publication.

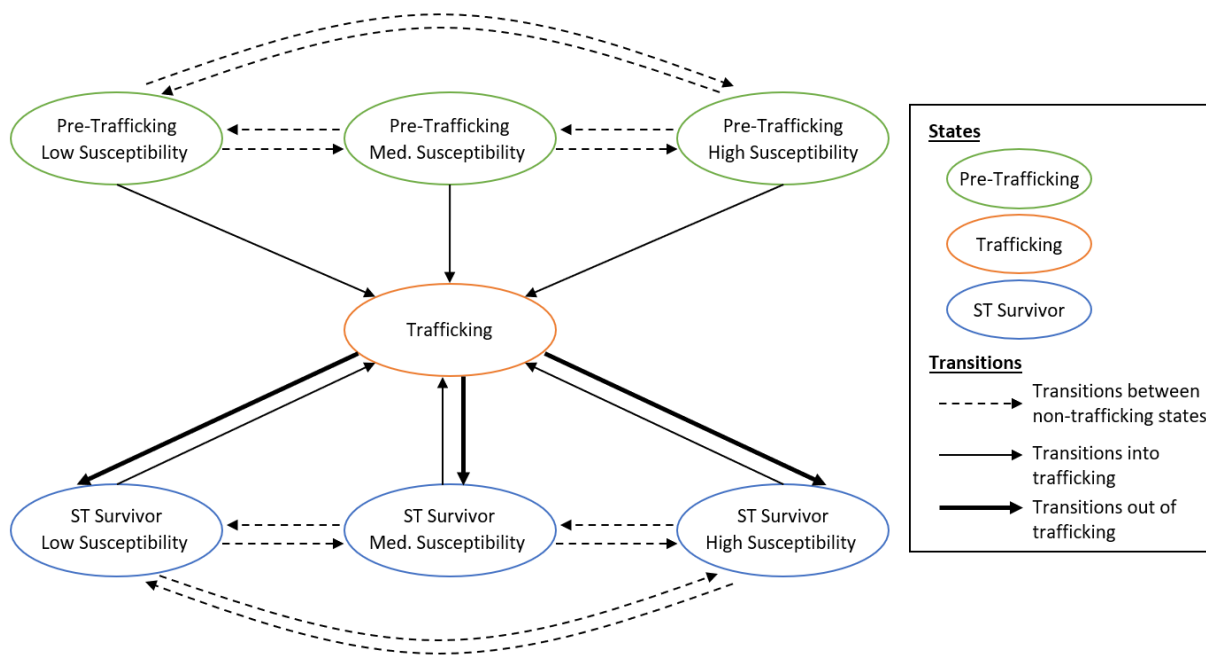
Computational Modeling

As described above, this study developed a Markov Chain to identify the likelihood of potential victims, victims, and survivors moving from differing states of susceptibility of recruitment into sex trafficking (or in the case minors, all instances sex trading). We undertook this model in response to research question 3 that asks “how” to model recruitment and

disruption of recruitment. A Markov Chain is a mathematical model of a system that consists of three main components: states, transitions, and transition probabilities. For readers interested in the technical specifications of the model, mathematical formulas are provided in Appendix 5.

Figure 2, below, shows the simple version of a Markov Chain model we developed in relation to susceptibility to sex trafficking. The diagram shows the potential pathways to and from a state of being trafficked without specifying the transition probabilities.

Figure 2. Simple Markov Chain of sex trafficking susceptibility and recruitment



In our Markov Chain that models recruitment into sex trafficking, states represent the different conditions or situations that influence susceptibility to trafficking. The transitions are the pathways a person travels between these different states. The transition probabilities describe the likelihood that a person will transition from one state to another along the various pathways. Figure 2 represents a simplified version of a Markov Chain model depicting recruitment into trafficking. This model shows, in the abstract, that a person’s current life situation could result in them having a low, medium, or high susceptibility to being recruited into sex trafficking, or currently being in a trafficking situation.

A key feature of Markov Chains is that how the process arrives at a particular state does not affect the likelihood of where it will transition to next. For example, if a person is currently in the “Pre-Trafficking: Med Susceptibility” state in Figure 2, their likelihood to be recruited into trafficking next is the same regardless of whether they recently decreased their susceptibility from high susceptibility to medium susceptibility or recently increased their susceptibility from low susceptibility to medium susceptibility. This is often referred to as the “memoryless” property of Markov Chains. However, memory can be built into a Markov Chain by redefining the states so that they are defined by not only one feature (e.g., susceptibility level), but by multiple (e.g., susceptibility level, and whether or not someone has been trafficked before). This is what we have done for the Markov Chain in Figure 2. To capture the differences in

susceptibility between people who have not been previously trafficked and those who had been trafficked (i.e., to add “memory” about their prior trafficking experience), we designate separate low, medium, and high susceptibility states for both of these populations. This allows us to understand the pathways and probabilities of both initial recruitment and re-recruitment into trafficking. While adding memory to the model enables us to more precisely incorporate how likely it would be for a person to transition from one state to another, it does have some drawbacks; adding more detailed states requires the Markov Chain to have more states, which requires more data to populate these states. For example, because we added memory about prior trafficking experience, the model in Figure 2 has 6 susceptibility states (3 for people who haven’t experienced trafficking and 3 for trafficking survivors), rather than only 3 (which would be the case if trafficking experience was not defined as a feature in the model). Other information could also be added into the Markov Chain’s “memory” as well, for example, tracking how a person’s susceptibility level has changed over time. However, as we will discuss in more detail below, data needed to populate sex trafficking recruitment Markov Chains is currently very limited, so adding memory into the model needs to be done with the data limitations in mind.

The lines in Figure 2 depict transitions between states, in other words, how a person’s current life situation may change over time. Dashed lines represent a change in susceptibility levels for a person who is not currently being trafficked. For example, a person struggling with substance use disorder with stable housing may have a reduced susceptibility if they go into recovery. This change could transition them along the dashed line from “Pre-Trafficking: Med Susceptibility” to “Pre-Trafficking: Low Susceptibility”. Alternatively, their housing situation could become more precarious, causing them to transition along the dashed line from “Pre-Trafficking: Med Susceptibility” to “Pre-Trafficking: High Susceptibility”. Thin solid lines illustrate recruitment into trafficking and bold solid lines indicate leaving a trafficking situation.

A Markov Chain model requires transition probabilities corresponding to each transition line. The transition probability indicates how likely it is that a person’s situation changes in one way versus another. This allows us to model the empirical reality that some transitions (or changes) are more likely than others. In addition to being a visual tool to illustrate how a person’s susceptibility to trafficking can change over time, a Markov Chain enables us to use mathematics to investigate how social or intervention changes may affect people’s susceptibility to trafficking. For example, we can use the Markov Chain to model how a change to a transition probability, perhaps by improving access to services and support systems, affects the percent of people recruited into trafficking and other related metrics. More details on this are included in the results section.

In the weather example described above, it is not difficult to develop a model and identify transition probabilities because there is an abundance of empirical evidence about weather conditions and historical weather data to analyze. Unlike the weather, we lack clear empirical evidence about sex trafficking, and there is no clear probability or longitudinal data in relation to how sex trafficking susceptibility changes over time and life course pathways in the aggregate or generally (e.g., NASEM, 2020). Thus, in order to approximate transition probabilities, we focused our Markov Chain model specifically on the population of youth in the child welfare system. We chose this focus because there is more data on this population compared to others. Further, there is strong empirical evidence that youth in the child welfare system and foster care systems have much higher incidence of sex trafficking than a general population of youth

(Franchino-Olsen, 2021; Martin et al., 2021; de Vries et al., 2020) strengthening this modeling choice. This focus provided a frame for us to identify empirical evidence for two stages of developing a Markov Chain: (1) conceptualize states and transition pathways, and (2) determine transition probabilities. We describe our process for identification of empirical data in two sections below, “Stage One: Process for Conceptualizing States and Pathways,” and “Stage Two: Determining Transition Probabilities.”

Even with this specific focus, we could not identify the full range of data needed to establish transition probabilities. Given the state of empirical evidence, we had to develop novel ways to verify and validate our modeling choices and transition probabilities through lived experience with the survivor-centered advisory group, quantitative data from the Minnesota Student Survey (MDE, 2023), and the academic literature (e.g., Tueller et al., 2021). We describe our process below in the section called, “Stage Two: Determining Transition Probabilities.” By triangulating these sources, we were able to identify reasonable approximations of transition probabilities to and from involvement in sex trading given different levels of susceptibility to sex trading (low, medium, and high), involvement in certain institutions (e.g., incarceration), changes in susceptibility levels, being trafficked, and being re-trafficked.

A further complication for our modeling process is that much of the literature and extant data about youth in child welfare and sex trading does not differentiate whether or not a third party was involved. As noted above, the TVPA views youth involvement in any type of commercial sex act as a form of sex trafficking; but for clarity’s sake when presenting results we use the broader term “sex trading.”

While our remedy for the present data limitations necessitated a focus on youth, we acknowledge that anti-human trafficking research and interventions have disproportionately focused on children. There is comparatively less research on adults, and almost no research on the full life course of adults involved in trafficking and their lives after trafficking. Additionally, racism, ableism, classism, and other societal issues shape susceptibility to human trafficking. However, we were not able to account for these structural factors in this initial modeling effort. We therefore advocate for future work within the anti-human trafficking field to prioritize the needs and experiences of people from a broader set of demographics. For this exploratory project, it was not feasible. In the next subsections, we describe our process for identification and approximation of empirical evidence for these two stages.

Stage One: Process for Conceptualizing States and Pathways

The model depicted in Figure 2 is too simplistic to capture the full complexity of life histories and pathways. Our transdisciplinary team worked together to enumerate common states and pathways. However, we had to be careful to limit the number of states because the more states we identified the more information needed in the data to determine transition probabilities. As we conceptualized states and pathways it was important for us to calibrate the level of detail included in our Markov Chain model with the level of specificity in the available data we would use to identify transition probabilities. This was a challenge. Our focus on the child welfare population, by definition, meant an experience of out of home placement and foster care for all youth in our model, so we did not have to include those as states in the model. We conceptualized the states based on empirical data on key factors associated with sex trading among youth in the child welfare population. Specifically, we triangulated three sources of information: (1) quantitative data from the Minnesota Student Survey, (2) data in the extant

literature, and (3) insights from the survivor-centered advisory group. We describe our process for each of these below.

Data Sources

Minnesota Student Survey Data (1). We used the 2019 Minnesota Student Survey (MDE, 2023) to identify correlations between variables related to sex trading for youth with experience in the child welfare system. The Minnesota Student Survey is a census-style survey of students in Minnesota schools administered every 3 years by Minnesota Departments of Education, Health, and Public Safety. The Minnesota Student Survey has one question about sex trading, “Have you traded or sold sex or sexual activity to receive money, food, drugs, alcohol, a place to stay, or anything else?” This question was only asked to students in 9th and 11th grades. The total sample of students who completed the survey included 71,007 students who answered the question about sex trading (Martin et al., 2020; Martin et al., 2021).

To help us identify states associated with susceptibility to sex trading, we analyzed a subsample of youth in the Minnesota Student Survey who indicated involvement in the child welfare system (N=1,940). We first conducted bivariate analysis to examine which factors were correlated with sex trading. For all factors with a statistically significant relationship to sex trading, we conducted logistic regression modeling. We examined sex trading as an outcome and sex trading as a predictor. The results of the logistic regression model are provided in a table in Appendix 6. Unfortunately, the Minnesota Student Survey does not provide longitudinal data or sequencing of events because it is a point in time survey. Thus, the Minnesota Student Survey data was not able to provide us with transition probabilities for the Markov Chain. More detailed information about the Minnesota Student Survey, including the survey instrument, can be found here: <https://education.mn.gov/mde/dse/health/mss/>.

Instead, the Minnesota Student Survey served two functions in our data triangulation process. First, we used this to identify and hone in on key factors to include in conceptualizing susceptibility states within the full Markov Chain model. Second, we used these figures to *test, confirm, and refine* transition probabilities; the Minnesota Student Survey data were not used as model inputs (i.e., transition probabilities), but rather as a way to validate our model outputs. Using our initial estimate of transition probabilities, determined by the process described below in the *Stage Two: Determining Transition Probabilities* section, we compared the Markov Chain outputs with data from the Minnesota Student Survey to provide an outside check on model assumptions. Take, for example, the factor of substance use disorder. We include this as part of the medium and high susceptibility state. Results from the Markov Chain analysis of the proportion of youth in the child welfare system who end up in substance use treatment should roughly reflect the proportion of youth in the Minnesota Student Survey who indicated substance use treatment. In this way, the Minnesota Student Survey data served as a guardrail to help assure that our transition probabilities would produce outputs that were realistic.

Data on Extent Literature (2). There are many individual and societal level factors that affect an individual's susceptibility to being recruited into sex trading and trafficking. As noted above, we could not include every single factor on its own. The more individual susceptibility factors that we included, the more detailed data we would need to populate the corresponding transition probabilities within the model. This poses challenges due to the limited data available in the current literature. Through a review of the literature and detailed discussions with the transdisciplinary team (including the survivor centered advisory group), we decided to control for some of the factors associated with sex trafficking through our focus on youth who have been

involved in the child welfare system (e.g., history of out of family placement, prior abuse, etc.). We identified three primary factors with strong research evidence for correlation with sex trading and trafficking: homelessness, mental health, and substance use (Franchino-Olsen, 2021; Reid et al., 2019; Jaeckl and Laughon, 2021). These also strongly correlated with the Minnesota Student Survey data analysis.

We decided to create states by combining these factors and assigning two levels for each of these three susceptibility factors (e.g., a youth either has or does not have access to safe and stable housing), resulting in eight combinations of vulnerabilities leading to our enumeration of states of susceptibility (see Table 5). While housing, mental health, and substance use issues were noted in the literature among youth who had traded sex compared to those who have not, the literature is unclear whether these factors were present before, during, or after trading sex. That is, did homelessness, mental health, and substance use issues increase a youth's chances of trading sex, or did trading sex increase a youth's chances of experiencing homeless, mental health, and substance use issues in the future? Unfortunately, the literature is sparse on sequencing and timing of these events in the lives of youth involved in sex trading.

Insights from the Survivor-Centered Advisory Group (3). To fill these gaps in the extant literature, the operations research team designed six vignettes to discuss with the survivor centered advisory group to get their perspective on sequence and co-occurrence of factors. For example, we used the following vignette to guide a discussion about whether housing or substance use had more of an impact on a person's susceptibility to trading sex.

Example Vignette: Chelsea and Thea are 16 year old classmates with similar economic backgrounds from the same neighborhood. Chelsea recently started having problems with housing due to problems with her family but doesn't drink or use drugs. Thea lives with her family but recently started using drugs and alcohol to get through the day.

For each vignette, we asked questions related to how susceptible the youth in the vignette were (not very vulnerable, somewhat vulnerable, very vulnerable), whether one youth was more susceptible than the other, and whether there was any additional information the survivor-centered advisory group would want to know about the youth to decide. We did this process with six other vignettes that honed in on the susceptibility factors we selected. All six vignettes are included in Appendix 7.

Triangulation of Data: Conceptualization Process

A particular youth's susceptibility to trading sex depends on many things. The three sources of information above clarified three points. First, some of the susceptibility factors increase the risk of trading sex more than others for most youth. Second, having more than one susceptibility factor can affect a youth's overall sex trading risk. Third, due to limited data on the precise impact each of these factors has on trading sex, we should group the eight combinations of susceptibility into low, medium, and high levels as shown in Table 5.

Table 5. Markov Chain susceptibility level characteristics

State	Homelessness	Mental Health Challenges	Substance Use	Susceptibility Level
1	No	No	No	Low
2	No	No	Yes	Medium
3	No	Yes	No	Medium
4	No	Yes	Yes	High
5	Yes	No	No	High
6	Yes	No	Yes	High
7	Yes	Yes	No	High
8	Yes	Yes	Yes	High

In addition to states related to levels of susceptibility, we needed additional states to capture other relevant circumstances. Based on the data sources above, we included states to represent incarceration or being in institutions like mental health facilities, chemical dependency rehab, etc. Finally, The Markov Chain literature requires a specific type of state referred to as an “absorbing state.” Absorbing states are such that once someone enters an absorbing state, they “get stuck there” and will not go to any other state. In a sense, an absorbing state represents the exit from the Markov Chain. Thus, our Markov Chain needed to include states to represent people leaving the cycle of susceptibility to sex trading. We also needed to account for youth who were susceptible to sex trafficking and sex trading, but who do not ever end up in sex trafficking or sex trading. In other words, the Markov Chain should include transitions out of a cycle of susceptibility with and without having been trafficked or traded sex. The inclusion of absorbing states reflects reality and is mathematically sound. Without absorbing states, the Markov Chain will have the mathematical property that if enough time passes, every person in the Markov Chain will trade sex, which is not realistic. Using our transdisciplinary process and the data described above, we identified many ways for a person to exit the Markov Chain cycle. Some may be desirable (e.g., someone having all of their needs met and developing strong support and coping mechanisms that will stay with them throughout the rest of their life) and others undesirable (e.g., death or aging out of the sex trade but still struggling to find stable housing or manage substance use).

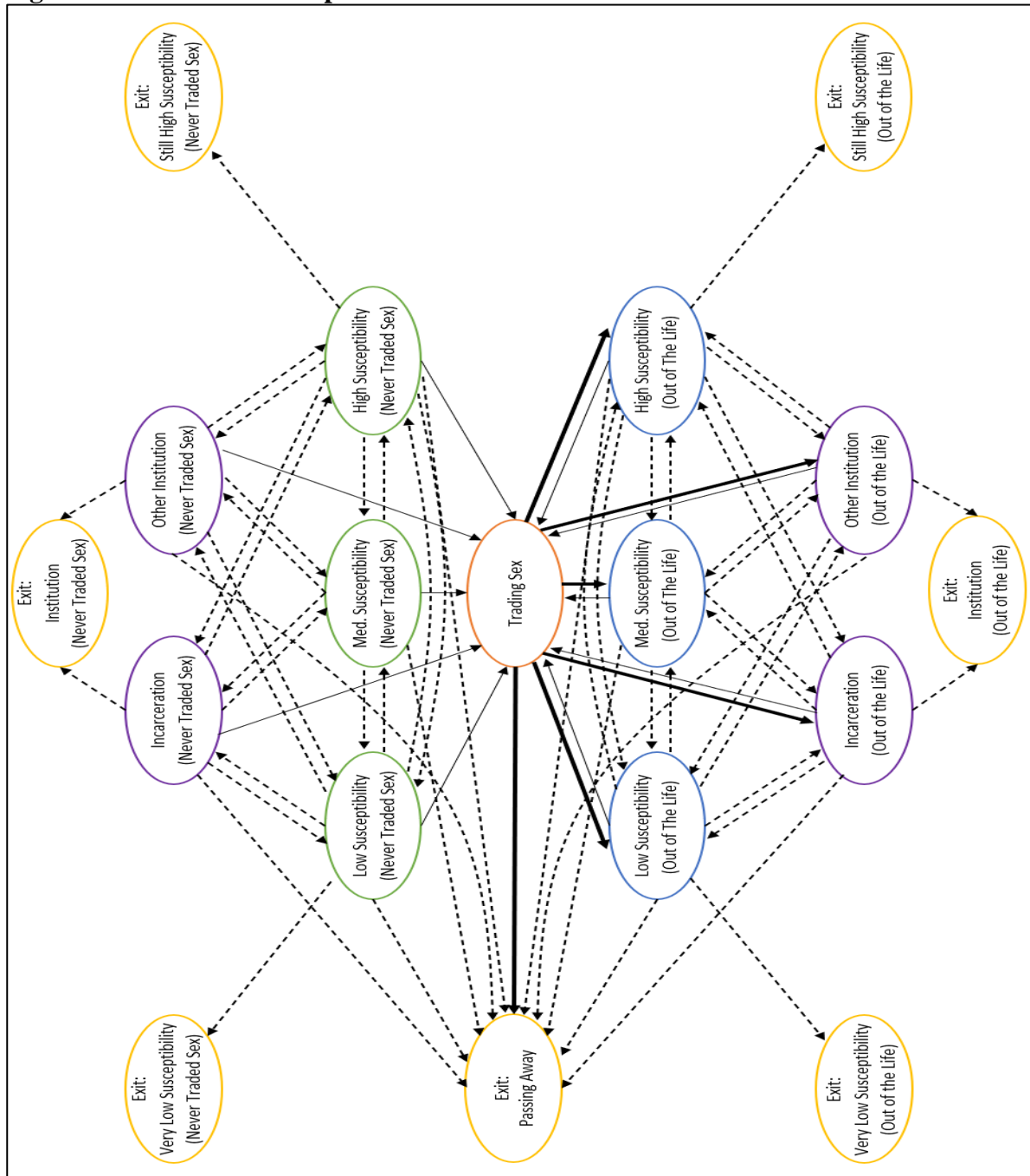
Through discussions with the survivor-centered advisory group, we identified three categories of absorbing states for inclusion into the model: (1) passing away, (2) no longer susceptible to recruitment into sex trading but still struggling with housing, mental health, substance use, etc., and (3) needs are met with strong support and coping mechanisms that stay with them throughout the rest of their life. For each of these absorbing states, we also note whether a person who enters the absorbing state had ever traded sex or not, which allows us to calculate summary Markov Chain statistics related to how many people ending their journey through the Markov Chain in each of these absorbing states had ever traded sex. These figures were then tested against findings from the Minnesota Student Survey and the extant literature to help us calibrate and refine transition probabilities.

Figure 3 brings together all of this data into our Markov Chain model conceptual representation of states and pathways. It is complex. Yet, we believe this complexity represents the complicated pathways of life experiences that many youth in the sex trade industry encounter over time.

The Markov Chain model we developed is easily adaptable to include additional detailed states and other populations as new data sets emerge to support a more detailed model. In particular, we believe our work captured the most salient states that youth in the child welfare system can occupy in terms of susceptibility to trafficking, but we do not have the data on the likelihoods that other populations would have transitioning between these states. Therefore, this model can be used for analysis on other populations as data.

While we believe our Markov Chain conceptualization is strongly rooted in empirical evidence, the empirical evidence on transition probabilities is much weaker. The next section describes our analytic approach to identifying reasonable transition probabilities. As more data becomes available, these transition probabilities can be refined.

Figure 3. Detailed visual representation of the Markov Chain model



Stage Two: Determining Transition Probabilities

As noted above, the data needed to populate the Markov Chain model is complex. Each of the transitions within a Markov Chain model (e.g., each of the lines within Figure 3) require a corresponding transition probability. This indicates the chances that a person will move from the state they are currently in immediately into a connecting state. In other words, since there are multiple options for how a person's situation could change next, we need to give the Markov Chain some information about how likely it is that a person's situation will change one way or the other. In the field of probability, these types of cases are analyzed under the topic of conditional probabilities. Unfortunately, the ideal type of data needed to populate our Markov Chain is absent from the extant literature. Data that does exist (e.g., the Minnesota Student Survey and statistics reported in the literature) provides only simple relationships, such as having risk factors that increase the chances of trading sex, that relate to our model output metrics, rather than our input data (i.e., transition probabilities). Since data related to the transition probabilities doesn't exist, we developed an inverse optimization model to work backward and identify the transition probabilities (i.e., input data) that would produce output metrics that aligned with the extant literature (including the Minnesota Student Survey). This allowed us to create a validated baseline model that represented how susceptibilities interplay with sex trafficking recruitment. Although the estimates we arrived at should be viewed as speculative, we took many steps to ensure that they are realistic. As more probabilistic or life course data emerges, these transition probabilities could be refined.

We first reviewed the literature to identify whether any prior studies exist that provide the specific input parameters (i.e., transition probabilities) needed for the Markov Chain. Data we were looking for required a before and after nature to provide the conditional probability information from which to infer whether having a particular vulnerability influenced a person's likelihood of trading sex or if a person's history of trading sex influenced their vulnerability afterward. No data of the nature needed for this model was found. Rather the extant literature focuses on aggregated statistics related to odds ratios and percentages detailing the proportion of study participations who had ever experienced certain risk factors for trading sex and whether or not they ever traded sex (e.g., Reid et. al., 2019; Franchino-Olsen et. al., 2022). The literature does not distinguish the degree to which these factors were present before trading sex, were caused by the sex trading experience, or were co-occurring. For example, we conducted statistical analysis of the Minnesota School Survey data pertinent to trading sex. However, the Minnesota Student Survey does not shed light on directionality magnitude. Similarly, prior literature does not provide sufficient data on how a person's susceptibility changes over time. These types of statistics are not transition probabilities, but we were able to use them as model validation metrics as described below.

To supplement the limited data availability, the operations research team designed a structured parameter quantification estimation approach. Specifically, the operations research team designed multiple vignettes to elicit information from the survivor-centered advisory group and the qualitative researcher team to estimate the transition probabilities (see Hanea et al., 2022, for more information about uncertainty quantification with content experts). The vignettes are available in Appendix 8. The elicitation literature, such as Hartley and French (2018), documents the difficulty of obtaining probability estimates from humans and provides guidance on

approaches that provide the most effective ways to elicit such information. Bias in judgments is a common issue, yet a bigger issue in this task was related to the uncertainties of assigning likelihood numbers to the susceptibility states we identified. In line with the literature on estimation, we focused on vignettes that asked respondents to order the likelihood that a youth's situation would change in particular ways. For example, survey responses to the following vignette and the ensuing team discussion helped us determine which transition probability out of the state "stable housing; substance use; mental health challenges" should be the greatest.

Example Vignette: "Aurora is 16 years old and is in foster care with a stable and supportive housing situation. However, Aurora uses drugs and alcohol frequently and has anxiety and depression. She has not previously traded sex. Which of the following below do you think is the most likely to happen next to her?" Response options include: (a) she starts trading sex; (b) she goes to an institution, such as a juvenile center or a rehab facility; (c) she addresses either (or both) of her mental health and substance use problems, making her less vulnerable; (d) she becomes more vulnerable (perhaps because she loses her stable housing); (e) she stays in the same situation (nothing changes from the prompt); or (f) she passes away.

These choices reflected the states that we included in the Markov Chain model. While the above approach provided comparative ordering information about transition probabilities, we also attempted to elicit quantitative percentages by asking the advisory group to consider various scenarios in which 100 child welfare involved youth are currently in the same circumstance (i.e., state). Since these 100 youth will not all have the same experiences of what happens to them next, we asked the advisory group to estimate how many of these 100 youth would experience different events next. That is, we asked the advisory group to consider the following:

Example Probability Elicitation Exercise: "Consider 100 youth who are currently trading sex. We only know that they are in the foster care system, but we do not know anything else about their past vulnerabilities or stories. What would be your best guess on what would happen next for these 100 youth? Please select the number of youth you think will experience the events below next. Example: If you select 30 for 'Going to an institution', it means that you expect about 30 of the youth trading sex right now will go directly to an institution from trading sex. The total number must equal 100." Response categories included (a) institutions; (b) having no housing, mental health, or substance use concerns; (c) having no housing concerns, but having difficulties with mental health and substance use; (d) having difficulties with housing, mental health, and substance use; and (e) passing away.

Not all possible options of what could happen next were included as response options due to the limitations described above in needing to minimize the number of states. For example, we did not separate institutions into "incarceration" and "other institution" categories, nor did we include states such as having no housing concerns, but having difficulties with either mental health or substance use, but not both. We made this decision based on the elicitation literature

that shows that the difficulty humans have in meaningfully answering these types of questions increases as more response categories are included.

Following the vignette approach, the operations research team conducted another “probability elicitation exercise”, this time with the qualitative researchers, to generate individual transition probabilities. This involved asking the qualitative researchers questions such as “Consider 100 people that are currently trading sex. After they leave their current sex trading situation, how many of them would immediately find themselves in the following states [response options: low susceptibility, medium susceptibility, high susceptibility, pass away, incarceration, other institution]?” We structured this exercise using tables in Microsoft Excel to ensure the responses to the 6 state options added to 100. Questions of this nature were asked for a majority of the states to cover transitions around victim-to-sex trading, sex trading-to-survivor, institutions to other states, and the remaining transitions. To ensure consistency throughout this exercise, we incorporated automatic checks within the file to ensure the broad likelihood rules identified from the vignette exercise and the literature were adhered to. For example, we used consistency checks to incorporate the prior knowledge that a person experiencing homelessness who has previously traded sex, on average, has a higher chance of trading sex again, than compared to a person experiencing homelessness who has never traded sex. These consistency checks relied on the published literature related to specific state characteristics to determine if our calculations were reasonable and broadly “fit” with what is currently known.

These aforementioned processes resulted in us having some transition probability estimates from the elicitation exercises and aggregated statistical measures from the literature and Minnesota Student Survey data. However, the elicitation exercises did not produce transition probabilities for all the transitions within the Markov Chain and those that it did produce were estimates. Therefore, our next step was to use this information to identify a complete set of transition probabilities that work together in the model in a way that results in aggregated statistical output measures that align with the literature on prevalence of youth in child welfare populations who trade sex (Tueller et al., 2023) and the Minnesota Student Survey data. This is done mathematically; Markov Chain models allow us to calculate the statistical output measures through equations that contain the transition probabilities.

Identifying the set of validated transition probabilities was an iterative process. Our initial estimates from the elicitation exercises did not produce output metrics that perfectly aligned with the literature. Thus, we needed to adjust the transition probabilities. However, the chain structure of the Markov Chains makes it hard for humans to calibrate the transition probabilities manually because changing the likelihood of one event can have hard-to-trace effects on the resulting output metrics since there are numerous paths through the Markov Chain. To help us with this process, we created a mathematical model to find transition probabilities without getting too far away from the initial estimates obtained from experts and within the stated conditions of what is known from the literature. From a technical perspective, this is an inverse optimization model that searches for a transition matrix that minimizes the deviation from the initial expert estimate matrix while staying within the given constraints, such as ranges and greater/less than types of constraints between transition probabilities, hitting probabilities, and absorbing probabilities. Appendix 5 describes these technical concepts in more detail.

Process to Test Effect of Interventions to Reduce Susceptibility

The resulting validated Markov Chain model, described below in the Results section, represents our estimates for how the sex trading susceptibility and recruitment system works. A benefit of the Markov Chain is that it allows us to test the potential outcomes of intervention or changes to susceptibilities and transition probabilities. The analysis can provide insights into how changes to the system may affect youth to identify positive, negative, or unintended consequences that could occur. With a Markov Chain, stakeholders could explore this information prior to implementing any changes or interventions. This has the benefit of getting insights into potential intervention strategies prior to dedicating time, money, and other resources to pilot the intervention. For example, in the Results section below, we provide an example of how a hypothetical intervention to improve access to housing for people who have traded sex affects the number of people who ultimately leave sex trading but remain in high susceptibility states compared to those whose susceptibility is reduced because they are able to better meet their needs.

Results

Below we describe results in response to our research questions. We applied the findings from the qualitative and computational data collection toward answering the research questions we set at the beginning of the project. Table 6 shows which data types contributed to answering each question. We also identified rich insights and unexpected themes that we do not report here because they are outside the scope of the original project research questions. These are explored elsewhere, including in the manuscripts listed in Appendix 2.

Table 6. Research questions and data to answer them

Research Questions	Data Sources
(1) How are recruitment networks <i>structured</i> in operations of trafficking for sexual exploitation?	Qualitative* data (key informant interviews)
(2) How do recruitment networks <i>function</i> within the overall sex trafficking operation, including concomitant labor trafficking committed by the operation?	Qualitative* data (key informant interviews)
(3a) Do recruitment networks offer the potential for <i>effective intervention</i> and interdiction to disrupt sex trafficking operations?	Computational* modeling; Qualitative data (key informant interviews)
(3b) If so, how can we create mathematical models to capture the cascading impacts that <i>disrupting recruitment</i> may have across the operation?	Computational* modeling
(4) What are the <i>unintended consequences</i> and <i>ethical implications</i> of disrupting recruitment networks? Can mathematical models capture these unintended consequences?	Qualitative* data (key informant interviews); computational modeling

Note: *Indicates the primary source of data

The results section is organized into five subsections corresponding with the research questions listed in Table 6 and a summary section where the two strands of data are “mixed.” First, to describe how recruitment networks are structured, we explore interviewee data about the differentiated patterns of recruitment relationships and strategies, followed by exploration of contextual factors. Then, in response to research question two, we combine data about recruitment relationships and contexts with findings related to what we term “recruitment mechanisms” within the whole process of recruitment and re-recruitment. The two parts of research question three each have their own sections that provide data and findings related to computational modeling using the Markov Chain model. Then we explore unintended consequences and ethical implications of our work. Finally, we conclude with insights from mixing the two types of data.

Research Question 1: How are recruitment networks structured in operations of trafficking for sexual exploitation?

To envision the structure of recruitment networks in response to this question, we relied on the transdisciplinary approach to shape our analytic approach to the qualitative interviews. Operations research envisions many types of networks that make up a business operation, including networks of relationships, information, or money. To answer this question, we

explored what our data suggests about relationship networks within sex trafficking operations that carry out the recruitment function. We explore who is involved in recruiting potential victims of trafficking, the nature, and types of relationships between recruiters and victims, and the contextual factors that shape the specific recruiters and how they recruit victims. Our systematic review (Martin et al., 2023) identified this as a gap in the extant literature on sex trafficking.

All of the key informants shared information about the people who recruit potential victims into sex trafficking operations. We define “recruiter” as the person who facilitates the initial introduction into a sex trafficking operation. This includes instances where the potential victim has never been involved in sex trading or trafficking and also re-recruitment and re-trafficking. Some of our interviewees referred to this as being introduced or recruited into “the life.” Interviewees identified that people involved in transactional sex without a third party could be particularly susceptible to recruitment into a trafficking operation.

According to our data, recruitment is structured through relationships, including familial, romantic, acquaintance, or peer relationships. One interviewee with extensive social service experience encapsulated this idea. “I don't think it's all related to poverty. I think there's a lot of social emotional pieces in it, because it's...relationships are involved” (MR010).

Our data suggested that the nature of the relationship between a recruiter and victim determines the recruitment strategy that is used. For example, a family member will use a different way of recruiting a potential victim than a romantic partner or peer. These patterns of relationship-based recruitment often determine who the recruiter might be in relation to a particular victim. Taken together our interviewees suggest that recruiters harness and leverage these relationship dynamics with specific recruitment tactics within recruitment networks formed by relationships. These relationships that foster recruitment are situated within contextual factors related to geographic or physical location, basic needs, and the broader culture. Many interviewees mentioned the foster care system as a central contextual factor because youth in foster care have had significant relationship fractures in their lives. Belonging and love are a need. As one interviewee said:

“Almost every person I've worked with at one point has been a foster child. [...] And when I say foster care, I think there's just a lack of this, that one person and that consistency, I think, just the lack of consistency in somebody's life.” - Prosecutor (MR024)

Recruiters and Relationships

Interviewees commonly suggested that recruiters could be anyone. Yet, when pushed to be more specific, they identified some key types of recruiters, including the trafficker, associates of the trafficker, so-called “bottoms” (typically a victim/former victim who partners with a trafficker), peers (including other victims), family, and sex buyers. Below we describe what our interviewees said about these different types of recruiters and the types of relationships they have with victims. We do not include a separate section for sex buyer recruiters because we learned very little about this role other than that they develop relationships with victims much like traffickers and make promises to provide for physical and emotional needs of victims.

Trafficker-recruiter

All of the transcripts provided data about trafficker-recruiters. Interviewees viewed traffickers as male, although some noted the possibility that this is not always the case. When the primary male trafficker was the recruiter, interviewees described the recruitment as happening in the context of an intimate relationship. In this case, intimacy and belonging are the primary initial recruitment pathways. Interviewees in this study described intimate partner relationships between trafficker-recruiters and victims, where the intimate partner was the recruiter. In some instances, interviewees suggested that the intimate partner relationships started by traffickers were established with the intent to traffic. While in other instances, the exploitation and trafficking arose later in the relationship. Our data suggests that both situations occur. Some interviewees also suggested that a trafficker-recruiter may also leverage power imbalances to initiate recruitment, such as if the trafficker is also a landlord.

Sexual intimacy was not the only form of intimacy used by traffickers that was identified by interviewees. A trafficker-recruiter may also initially offer belonging, safety, and basic needs. This is illustrated in one interviewee's experience as follows:

“...my trafficker, he started out as my drug dealer...I was using drugs, I wasn't allowed at home because of that. So, I was technically homeless. He would take, give me places to stay. I didn't have any money for basic need items. Because I was spending the money I did have on drugs. So, he would then do that, like provide me with those things, and really build a solid foundation of like, 'I can give you these things' until it turned into like 'I've done all this for you. What are you going to do for me?'” - Lived Expertise and Social Service (MR004)

Bottom or Main Girl-recruiter

Interviewees identified that a “bottom” or “main girl” was also involved in recruitment. This role was described as a female who was second in charge and usually a victim who was “promoted.” We found specific mention of this in 12 transcripts. Interviewees suggested that a female bottom-recruiter offers a different aspect than a male trafficker-recruiter. One interview described it as the following:

“...a lot of times, you'll have, you'll have a main trafficker, and then you'll have what we call a bottom/recruiter. And that person, in a sense, if you want to look at it is maybe like, second in command, are second in charge. And that person, though, is solely responsible for going out and finding more, more women and they're also considered the 'trainer' in a sense. So if you do get a new victim, that bottom/recruiter is responsible for if they're going on dates, she goes with them. She tells them, you know, what to do, how much you're going to charge. So like I said, in a way they're the trainer of this new, new person, and I guess it's, you know, break them in type thing.” - Law Enforcement (MR018)

Trafficking Associate-recruiter

As noted in Tables 3 and 4 above, most of our data pertains to smaller-scale and familial trafficking operations. Thus, our interviewees shed less light on more complex trafficking organizations with multiple layers of people in a “trafficking” role. Twelve transcripts provided

information about a trafficking associate-recruiter. Interviewees described these associates of a primary trafficker as a partner of the trafficker in some instances and a subordinate in others. Some interviewees said that a trafficker might have one or two associates that they work with, most identifying them as men. Interviewees described that Associate-recruiters typically develop friendly relationships with potential victims so they can then introduce the potential victim to the trafficker. The associate-recruiters build a web of relationships and connections that a trafficker can use to develop their own relationship with the victim. Traffickers, bottoms, and associates build an interconnected social web that can be leveraged to recruit someone into a trafficking operation. The social relations create a feeling of closeness that disarms a potential victim. In a less common case, the associates of the trafficker were highly hierarchal. One interviewee described about 10-15 men who were associates of the trafficker and were responsible for recruiting women.

Peer-recruiter

Peer recruitment was a very common theme across transcripts. Twenty-seven transcripts discussed peer-recruiters. Interviewees described peer recruiters as matching the demographics of the potential victim as closely as possible in terms of gender, race, and age. Interviewees described peer recruiters in the context of youth. For example, one interviewee said the following:

“He [the main trafficker] would have a bunch of minors that he had, that when they weren't in lockup, they worked for him, but their main goal was to try to get in lockup, so that they could go recruit and bring more girls back to him.” - Lived Expertise and Social Service (MR013)

Peer recruiters were typically described as part of the operation as victims who also recruited others in their peer and social groups. The initial introduction of new victims through peer recruiting happened through social ties. Some interviewees suggested that over time a trafficker would seek to develop a romantic relationship with these new victims. In situations of peer recruitment, the subsequent romantic relationship cultivated by a trafficker seems to be more of a “maintenance” tactic rather than initial recruitment.

Interviewees described several different relationship types related to peer recruiters. Some suggested that LGBTQ+ victims were encouraged towards involvement in “the life” by an older LGBTQ+ individual (sometimes seen as a mentor) as a way of survival. Another example is a victim of trafficking from Southeast Asia who had “earned” their freedom through sex trafficking and was recruiting peers in their home country. In this example, the peer recruiter used their example of “success” to give a positive impression of the trafficking situation. Some interviewees suggested that peer recruitment happens online using existing social media connections and networks to connect with people. The data exemplified this with multiple informants mentioning that recruiters will become Facebook friends with many of the potential victim’s Facebook friends as a way to establish trust.

Familial-recruiter

Family members described as recruiters included parents, siblings, aunts, uncles, cousins, or other extended family members. Sometimes traffickers and others in the operation used family terms, such as “uncle” or “cousin” to refer to close family-like bonds beyond blood relation

within an operation. While an important cue to the role of belonging in trafficking, this section does not pertain to the use of familial terms to describe relationships within a trafficking operation, such as referring to the operation as a “family” or “wife-in-laws” to describe multiple victims.

Twenty-two transcripts mentioned familial-recruiters. Our findings suggest that in familial recruitment the relationship context can be a stronger influence on recruitment than the specific tactic used. Many interviewees talked about how familial recruitment is not so much about what is said, but rather about the existing relationship between parent and child. Children follow what their parents say because of parental authority and perhaps trust. Interviewees also placed familial trafficking in the context of overall familial poverty and said that familial trafficking normalizes involvement in commercial sex. In this context, the relationship is the recruitment. One interviewee described it in the context of familial survival and “duty.”

“This is far more along the lines of survival sex. Okay, maybe it was a family business, this is the way that we're able to survive. But it played upon the same dynamic of besides needing to survive, you owe it to the family to be part of it. It's now your job. Just as it was my job to help my family, my parents in front of me and my uncles and cousins or whoever they were. It's your job to be part of that tradition as well. And so, you can't abandon that because you're abandoning me.” - Social Service (MR001)

Another described familial trafficking from the position of generational trauma.

“...it's not really that they're even drawn in, it's, you know, from the time that they're born, they're born into the scenario, most of the time, it's historical sexual abuse, at the hands of a family member. And it's, it's a way of life. And, you know, it could be generational trauma, or a history of sexual abuse through the generations. And so it, unfortunately, could look normalized to the actual victims. So, there's that side of familial trafficking.” - Law Enforcement (MR021)

Another interviewee also described how familial trafficking is generational and unfolds over time.

“It most of the times families already, you know, trafficking their kids through generational trauma, maybe the mother or the father was involved in trafficking when they were younger. So it just becomes a normal thing, like they're grooming them all their life. Like, they say things like, don't ever lay on your back and not get paid for it. They're grooming these people all of their life to be able to use their body as a meal ticket. So it's not like one day, this one generation, this one mom or pop [sound cut] for sex. This has been happening in her family or their family for years. Right? There's really not too much recruitment into it. Because they were grooming them their whole life for this.” - Lived Expert and Social Service (MR033)

Contextual Factors that Shape Recruitment Relationships

In addition to the relationship between a type of recruiter and victim, we also identified three contextual factors that shaped recruitment relationships: (1) geographic and physical locations

where potential victims shape recruitment; (2) basic needs not met; and (3) broader culture, referred to as “groomed by society.”

Physical Location

Interviewees suggested that specific locations influence how the initial recruitment into an operation happens. We identified information about this in over 80% of the transcripts. For example, many interviewees mentioned recruiters spending time in places where they suspected vulnerable people frequent. Some of these sites were more explicit regarding that criterion such as skyway or subway systems, bus depots, jails, welfare offices, homeless encampments, and residential treatment facilities. Other interviewees mentioned sites like workplaces, malls, strip clubs, gas stations, grocery stores, and nail salons that the recruiter used as a “casual” place to meet and develop relationships with potential victims. Describing the difference depending on the amenities in an area, one person stated the following about recruitment:

“So I think it [recruitment] really is dependent on the location, what's in that location. The [Twin] Cities are gonna look very different than what it looks like up here [northern Minnesota]. You know, up here, we don't have clubs, we don't have like Mall of America, we don't have those types of things. So it's going to be a lot of like, parties, school, word of mouth.” - Lived Expertise and Social Service (MR013)

Basic Needs

Some interviewees suggested that situational factors shape recruitment as much as or in tandem with the relationship between a recruiter and potential victim. Lack of access to basic needs places a person into a context where they are more vulnerable to recruitment to meet these needs. Lack of basic needs also places someone in proximity to locations that recruiters frequent. For example, youth living in homeless shelters or attending drop-in services may be specifically targeted. Losing access to transportation and being stuck in a location can lead to a recruitment situation. This type of opportunistic recruitment is described below in the section on recruitment mechanisms, specifically in a subsection on manipulation of basic needs.

Recruitment networks and recruiters of all types are connected to people who engage in survival sex, defined as sex trading that occurs as a way to meet basic needs. As described above, these social relationships can be used as a conduit to recruit someone into a trafficking operation. In this way, sex trading to meet basic needs can lead to recruitment into a more formal operation. Later sections provide more depth on this theme.

“Groomed by Society”

Almost half of the transcripts discussed cultural and social factors that contribute to the creation, existence, and maintenance of recruitment networks and their structure. One of the interviewees used the phrase “groomed by society” and we created a code for this concept. Through our informant interviews, we identified several of these contextual factors including socioeconomic status, familial norms, and broader society and culture.

Similar to the theme above, interviewees indicated that lack of basic needs in and of itself is a way that society “grooms” a potential victim by making them more vulnerable to recruitment. The push of socio-economic factors is strengthened by societal norms that perpetuate and normalize manipulative dynamics, hyper-sexualization, and materialism. One interview with lived expertise and social service experience said, “Sometimes I feel like society

makes certain, a certain group of people feel like this is the only thing that's for you because this is what you came from” (MR012).

Interviewees noted that social media is a key vehicle that perpetuated normalization of manipulative dynamics. For example, one interviewee with lived expertise and social service experience, discussing widespread and joking use of the terms “pimp” and “ho” said, “So, I think that our society has a play in recruitment, because of how those things are portrayed” (MR013). Another interviewee said:

“The media, the songs, the movies. Like everybody thinks it's okay to do drugs, because it's all over you know, the songs and the internet and, you know, the hip hop culture and the rap culture and the TikTok culture, either, even, I mean, it's just everywhere, like Only Fans, and all of that is, is glorified.” - Lived Expert and Social Service (MR033)

Hyper-sexualization on a societal level was described as a way of grooming both potential victims and buyers, as well as possibly traffickers. Many interviewees suggested media makes manipulation and trafficking seem normal, or as one social service provider phrased it, a “natural dynamic of society” (MR010). Familial and generational norms were discussed as a way in which trafficking is normalized and maintained. The environment itself, grooms children to be involved in the recruitment network.

While the social processes behind the notion of “groomed by society” can impact everyone, interviewees noted specific and deeper ways that our society pushes or “grooms” people of color, indigenous people, and people living in generational poverty to be more susceptible to recruitment into trafficking. Interviewees discussed the impact of legacies of colonialism, racism, and exploitation on communities and families as a way of grooming specific communities—specifically racial and ethnic minorities. An interviewee with both lived expertise and social service experience described it as, “a generational curse” (MR012). Another said:

“Indigenous folks, native folks who are doing this, because it has been reinforced that Native people are a commodity in this country from the second we taught them how to fish, right? Like coming into this place here, we taught them how to bait right, like these things. We have intentionally been a commodity in the country, you know, and exported to other countries, like all of these different things that happened, that I think we cannot let that piece go. And just distill it down to well, they just don't have enough economic resources.” - Social Service (MR026)

Conclusion

This section laid the groundwork for how recruitment networks are structured. Our primary finding is that relationships form the backbone of recruitment networks and that the recruitment happens within specific contexts, specifically geographic locations, lack of basic needs, and normalization. Almost any type of relationship could be a recruitment network within a trafficking operation including intimate partners, friends/peers, family members, and social acquaintances. The next section builds on these conclusions to describe findings in response to a question about how recruitment networks function.

Research Question 2: How do recruitment networks function within the overall sex trafficking operation?

This section describes what we learned about how recruitment networks function. The first sub-section below describes the concept of “recruitment mechanism.” We define a recruitment mechanism as “what gets you in” or “what gets you back in.” This is the specific tactic, point of leverage/advantage, or “thing” a specific recruiter does or says to initiate the recruitment process. We define “tactic” and describe specific tactics in the section below called “Recruitment Mechanisms.” A salient feature of our findings is that recruitment mechanisms vary depending on the contexts of the existing or newly developed relationship between the recruiter and the potential victim. The following section examines these tactics in the context of re-recruitment in a section called “Re-recruitment into trafficking.” The conceptualization of recruitment mechanism is a key finding. However, interviewees noted a great deal of variability in how these recruitment mechanisms unfold in reality. A prosecutor we interviewed, said, “I think things are less organized than we want them to be from a prosecution perspective, or from coming up with a model, right? I think it's really dependent” (MR024).

The third section below provides a visualization of the entire process of recruitment, called “Recruitment is a Process.” The notion that recruitment (and re-recruitment) is a process is another key finding. It starts with the first time a potential victim is recruited into a trafficking operation. Critically, for victims, the potential for re-recruitment is embedded throughout their experiences in a trafficking operation unless enough appropriate resources and supports are in place. Through thematic analysis of the qualitative interviews, we identified six key components of this process: (1) what gets you in; (2) what keeps you in; (3) initial exit; (4) basic needs not met; (5) what gets you back in; and (6) survivor support. We discuss this in depth below through a figure visualizing this process as surfaced from interview transcripts.

Recruitment Mechanisms

A key aspect of our data collection was to identify the tactics used by recruiters to recruit victims into a sex trafficking network. We define the term “tactic” to describe the specific strategy and actions a recruiter uses in the context of a relationship between the recruiter and the potential victim. Based on our analysis, themes across transcripts suggest that the specific tactic used by a recruiter emerges from the triangle in Figure 4 (potential victim, type of recruiter, and site of recruitment). We identified the following “tactics”: coercion and force, fraud, belonging, seduction, basic needs, glamour, and normalization.

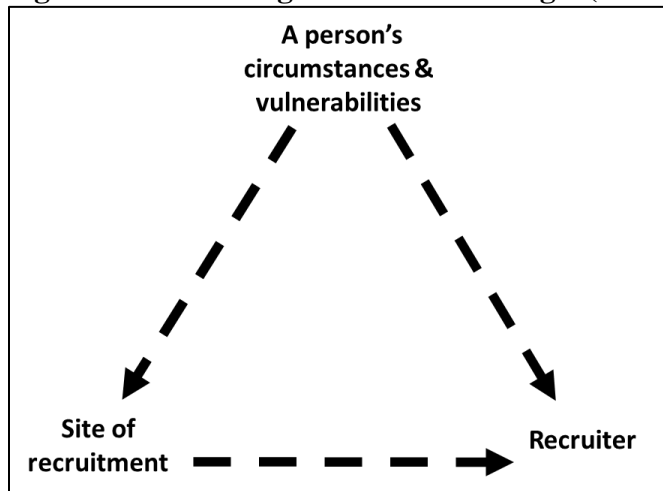
Based on our data we refer to this as “what gets you in.” Figure 4 below shows three components our data surfaced that come together to shape the recruitment mechanism. Potential victims' circumstances and vulnerabilities influence the type of recruiter that attempts to recruit. For example, if the potential victim is an adult heterosexual female looking for acceptance, the recruiter may be an adult male trafficker. In some locations (e.g., youth in juvenile detention or schools), the site of recruitment is an intermediary, influencing the type of recruiter. For example, if a trafficker is looking to recruit young people in school, they will likely determine that peer-recruiters are the right choice. Alternatively, if a person uses substances, a trafficker would zero in on that and offer drugs. Our data indicated a relation between these factors, and some instances of intentionality in determining who from an operation will initiate recruitment of specific potential victims, particularly victims in specific locations.

On interviewee described recruitment in relation to the “crime triangle” as a way that traffickers leverage vulnerabilities.

“So I kind of compare it to like, the crime triangle, where you have the suspect, and the victim and the opportunity. Same with trafficking is you have someone who is a predator, and you have a victim, who's vulnerable, and they're by themselves, or it's an easy way to talk to them, whether it be through social media or in person. That's the trafficking opportunity. And once you have those three things, you have a pretty viable chance of having a sex trafficking organization.” - Law Enforcement Analysts (MR028 & MR029)

However, we did not interview traffickers or recruiters directly, so we cannot confirm whether this is a deliberate strategy or just emerges in practice. The relationships that structure the triangle, as described in the previous section, determine the tactics that recruiters may use or combine.

Figure 4. Trafficking recruitment triangle (What gets you in)*



*NOTE: Dashed lines represent a possible influence from one factor to another. The arrowhead indicated direction of influence. *Indicates that this relationship is included as part of a larger visualization in Figure 5 below.*

It is clear that many of the recruitment tactics we describe below are interconnected. It would be unlikely that a recruiter would use only one of these. For example, we articulate the offer and manipulation of belonging as a distinct tactic to lure a potential victim, but of course, the need to belong is in the background or subtext of many of the other tactics as well. As described by interviewees, actual instances of trafficking recruitment blend aspects of the tactics listed below, depending on the relationship a recruiter has developed with their potential victim(s) and the identity and experiences of the potential victim. Describing recruitment like this complicates it. In doing so, we are able to identify the different ways that recruitment can happen more deeply than just saying that one type of recruiter will recruit in one way. Below we describe what the interviewees said about each tactic.

Coercion and Force

All interviewees discussed the use of coercion and force as a constituent part of trafficking. This is not surprising. Similar to the broader literature on trafficking (Lotspeich et al., 2023), interviewees did not provide a consistent definition of coercion or force. Most used it to describe a situation when someone was compelled to participate in a commercial sex act. Some interviewees explicitly stated that coercion and use of force were not typically part of the initial recruitment. However, several of the tactics listed below imply subtle coercion (e.g., normalization). In the beginning of a recruitment relationship, in the first encounters between the recruiter and potential victim, interviewees suggested that a recruiter does not typically use force. Our data suggest that overt coercion and the use of force come later, as part of the transition from the initial recruitment (or re-recruitment) phase into a maintenance phase of being trafficked (“what keeps you in”).

Coercion in a family context for example will look different from coercion between romantic partners. Not only will it differ in the words said by a recruiter, but also there is a different type of grooming occurring. Speaking about parental trafficking, for example, an interviewee stated:

“You know, whatever mom says, is what it is that I need to do, and those kinds of moms are very manipulative. They'll say, ‘hey, you're the reason why my light bill is, is skyrocketing.’ You know, when really... they're not the reason.” - Lived Expertise and Social Service (MR012)

A romantic partner recruitment relationship may also pressure a potential victim by referencing all the help and support they have provided. However, the reasons for complying are different from a parent. Sometimes sexual violence is used in this process as a way to increase a victim’s vulnerabilities and strengthen the recruitment. A law enforcement officer we interviewed said that, “the rape, that violence, that happens pretty, pretty quick. They call it breaking them in.... they’ll break in the girls” (MR025).

Fraud

Interviewees also described a recruitment mechanism based on fraud in which a recruiter knowingly or substantially misrepresents what the trafficking operation will be like. A clear-cut instance of a fraud-based recruitment mechanism is bait and switch. Some interviewees described recruitment in which potential victims were recruited under the guise of being a dancer or a model, for example, but then were unknowingly being recruited for sex trafficking. Many interviewees suggested that it was most common to use fraudulent means in the very beginning to build trust with a victim. One interviewee summed up what many said about fraud.

“[T]he force part usually comes after the recruitment and grooming process after that trust is built. You know, it's, I've very rarely seen where force is the immediate control. Usually what happens is it goes from the psychological manipulation to getting that person into control by the trafficker, and once the trafficker has control psychologically, emotionally, mentally, then the physical force will start.” - Law Enforcement (MR021)

Similar to coercion and force, it is hard to differentiate fraud or fraudulent claims from aspects of the other recruitment mechanisms we identified. Many of our interviewees, including interviewees with lived expertise, identified interconnections between fraud and all the other recruitment mechanisms because what a trafficker or recruiter promises (i.e., security, care, a good life, etc.) is not what victims receive, at least not in the way they thought they would. The theme of recruitment based on fraud overlaps with seduction, glamour, basic needs, and belonging described below.

Belonging

Many interviewees talked about how the need to belong is at the root of many other tactics to recruit people into sex trafficking. As we noted above, recruitment happens through relationships and relationships create a feeling of belonging. Thus, the way a recruiter uses the feeling of belonging varies depending on the relationship context. Recruiters use belonging as a tactic to recruit by offering a sense of kinship and care to a potential victim. Interviewees discussed belonging as related to coercion, but also as a separate thing. Many victims, particularly those with a history of abandonment or marginalization, are drawn in by the promise of belonging somewhere. This was a common theme, and similar to use of fraud, it underpins many of the other recruitment mechanisms described by interviewees. Several interviewees explained how the search for connection could lead to recruitment.

“A sense of belonging, like that community, and people like get you, things like that. And so I think that's where that's it, especially at a time when you got hormones everywhere, you're a young person, it's like, you want to do whatever you can to find a person that, you know, you do feel connected with and like, understood. So I would say that, like, just identifying that you have someone that gets you.” - Social Service (MR016)

“But then it usually goes into like, intimate partner, right, and that kind of way. But also the sense of like a family and belonging that could happen, where they don't have the responsibility for caring for siblings, where they don't have, where their utilities won't be cut off.” - Social Service (MR026)

Recruiters utilizing a romantic relationship context will play on these vulnerabilities through a seductive technique in order to get a victim to enter a romantic relationship. Many interviewees described recruiters as charismatic and charming. Others stated that recruiters get to know the ins and outs of potential victims' lives in order to use it against them later and keep them as a victim. To victims however, this just appears as care for their lives.

The need to belong and the use of belonging as a recruitment tactic happens outside of a romantic context. Belonging is interrelated with the relationship between LGBTQIA+ youth, particularly transgender youth, and older adult 'mentors' as mentioned previously. Recruiters present trafficking as a way of survival in environments where queer youth do not have the needed supports. Belonging plays a role in this and other examples of recruitment of queer youth. One interviewee mentioned that in rural areas, queer youth may be easily recruited online due to feeling for the first time that it is okay to be who they are. This recruitment is

manipulative because acceptance can be turned against a young person, particularly if that young person has not yet come out as LGBTQIA+.

Seduction

More than half of the interviewees described recruitment mechanisms based on romantic seduction. This is not surprising given that this is a common theme in literature and practice. Seduction and belonging are similar. However, interviewees made clear distinctions between these two tactics. Interviewees described the recruiter-trafficker using this tactic as being charming and a good listener; offering love, care, and a romantic relationship with offers of help. This relationship then gradually shifts to coercion and emotional manipulation with a pattern of intermittent love and abuse. As one person with social service expertise said, “the light kind of switches” and they are “brought into the life” (MR003).

“But a lot of pimps I see nowadays are romancing folks, are providing things for folks that they never had before, are isolating folks that nobody cares about. So it's more a mind thing than a physical thing.” [...] A lot of pimps can be aggressive but they're learning nowadays that it's easier just to romance somebody.” - Lived Expert and Social Service (MR033)

“Traffickers are... they're some of the most evil people I've ever met, but they also are extremely [...] can be extremely charming and manipulative and so they kind of do this seduction, they basically seduce youth who they know have vulnerabilities like if they're homeless, and don't have a place to stay. And they basically seduce them into falling in love with them.” - Social Service (MR011)

This recruitment mechanism was described as being used across the board with many different types of victims in different circumstances, including a wide range of ages (youth and adult), all geographic areas, and for people in poverty or higher socio-economic status. A primary driver in how the seduction recruitment mechanism works is to fill a gap or longing for love, connection, and support experienced by a prospective victim. Interviewees described situations where the seduction took place in only a few days or playing out over months or years. This theme blurred with discussion of domestic abuse blending into trafficking.

This theme also includes the use of online flirtation or flattery, which only five interviewees specifically mentioned. This online tactic of recruitment was specific to youth because youth are online. Interviewees indicated it as an especially potent recruitment mechanism for youth with marginalized identities or youth who do not feel they belong. This highlights another interconnection with the tactic of belonging. Interviewees said that it starts with flattery and compliments and often happens on social media and dating apps. The recruiter-trafficker will approach as a friend of a friend. The online flirtation and flattery can be a way to convince someone to meet up in person where the tactic shifts to seduction.

“Yeah, the compliments, sort of things like that. Just filling their egos. Not egos but self-esteem. So it's more focused on their wanting to belong and feel something versus their basic needs situation.” - Lived Expertise and Social Service (MR004)

“I think the biggest one I've seen online enticement is just like the, the compliments, the grooming, and kind of like the hype. So, whether it's an opportunity for employment, or for a relationship, or more likes on their photo, whatever the outcome is that even just saying that someone has a nice smile can go a long way.” - Social Service (MR003)

Basic Needs

All interviewees discussed ways that traffickers manipulate and capitalize on a lack of basic needs. Coercion is implied in this manipulation, but interviewees discussed it as a separate thing too. Recruiters look to get a potential victim into a situation where they rely on the recruiter for their basic needs. Even the potential threat of losing access to the things you need to survive is a strong coercive force for a potential victim to become involved in a sex trafficking operation. One interviewee with social service expertise and deep community connection discussed the recruitment of Black cisgender boys by individual older female traffickers. The informant described this relationship as these boys feeling like they are doing no more than providing a service, not recognizing their reliance on the women for survival, thus constraining their ability to give consent to the sex acts. The boys were described as using this to be able to afford things for themselves and their siblings, things that parents often could not afford to buy them due to the impacts of general poverty and systemic racism (MR030).

A subtheme in the manipulation of basic needs as a recruitment mechanism is the idea of recruitment through convenience or opportunity. The contexts, experiences, and conditions that make someone more susceptible to being trafficked also place them in closer proximity to potential recruiters. For example, many interviewees noted that youth in homeless shelters or drop-in centers are easy to recruit due to their location and needs. Some interviewees suggested that recruitment could be successful in those moments when a potential victim was in the wrong place and was in a bad situation so they were right there for recruiting. Similarly, recruitment happens in other spaces where homeless or particularly vulnerable youth hang out, like buses, jails, homeless health clinics, the skyways or staircases or hallways, libraries, homeless encampments.

There is an opportunistic aspect to trafficking. As one social service provider said, “some were maybe like opportunistic, kind of traffickers, where they just they saw a moment, there may have been drugs, usually” (MR009). This is also about helping youth access things they do not have the money or ability to get. Traffickers can create convenience by using drugs and alcohol and chemical dependency.

Some discussion of familial recruitment also touched on convenience or opportunity since children or other potential victims are in the home. As one interviewee put it:

“I don't know how to say this in a good way. I think that a lot of times it's convenience, if that makes sense. So, I've worked with youth who are trafficked by their parents, they were traded for drugs. And in that case, kids are there and here they are. If you want to have sex with my kids, then you can and then here's my drugs in exchange. We did have a parent who traded their daughter for a car. Again, I just think it's all because they're there.” - Social Service (MR002)

Glamour

Interviewees described “glamour” as a recruitment mechanism where a recruiter presents sex trading and trafficking as a glamorous lifestyle, full of fun, material goods, and adventure. Just over three-quarters of the interviewees discussed this. Interviewees distinguished between the recruitment mechanism of meeting basic needs from this idea of glamour. This is also similar to fraud, but interviewees discussed glamour in a different way. This recruitment mechanism has two aspects: (1) offering glamorous things and a lavish lifestyle, and (2) glamorizing the life itself as fun and a way to travel. Interviewees also described the allure of “fast money,” feeling pretty, and being popular. These two quotes exemplify the themes.

“Hey, wanna party with me tonight and kind of has its lifestyle and says, hey, by the way, you know, I can provide you this, fancy shoes, place to stay, if it's something like that, in order to- as long as you have sex with these guys.” - Law Enforcement (MR007)

“But who kind of glamorize and gloat like, idolize the exploitation, because they see it as easy money and like, some of them have the goal of when I turn 18, like, I'm not going to have a job, I'm going to start an OnlyFans page, and that's how I'm going to make my income.” - Social Service (MR010)

Many interviewees described recruiters presenting themselves as wealthy, well-liked, and fun and providing purses, shoes, phones, and other material items. The use of glamor and flashy things happens early on in the recruitment process but does not last. An interviewee with social service experience within a law enforcement agency said, “I think the idea of glamour behind it, of money, of presents, of things like that, that eventually kind of dissipated over time” (MR017). Interviewees suggested that after a victim is lured in, recruiters expect the victims to pay them back for the things that they bought them and that payment would result in sex trafficking-related activities.

Glamour entices someone to a life, not just of meeting basic needs, but also of living in excess and wealth. Interviewees suggested that this glamorous image is fraudulent in that the recruiter may be doctoring evidence of their glamorous lifestyle or the potential victim may not actually be able to access this wealthy lifestyle. Interviewees also pointed out that the idea of what is glamorous depends on a person’s life experience, so for some flying on a plane and staying in a hotel can seem very glamorous.

Heavy manipulation of potential victims makes them feel like they owe the recruiter. Romantic relationship contexts intersect with glamour in that glamour can rope a potential victim in and establish a relationship of care through providing material desires. Several interviewees suggested that glamorization of the lifestyle of trafficking could be a way to assuage guilty feelings or stemming from a feeling of pride about their involvement and bringing people into the life. Some suggested that bottoms are a key part in emphasizing the potential glamor of the life. One interviewee with social service expertise pointed out that while recruiters may try to use glamorization, that not all youth fall for this, saying, “sometimes these kids are pretty fucking smart” (MR027).

Normalization

Normalization or minimization of the harms of trafficking refers to the ways in which a recruiter will make sex trafficking seem like it is not a big deal. Interviewees suggested that this was common among peer recruiters. In peer recruiting, the peer develops a relationship with a potential victim based on shared identity and solidarity. By presenting themselves as someone who has been where the potential victim is and is now doing well because of their involvement with their trafficker, they are using this to normalize the trafficking experience. This mechanism is connected to coercive behavior, but interviewees differentiated it as a specific recruitment tactic. One interviewee described a situation where a man recruited his female partner using normalization. The male partner used pornography to attempt to have their female partner become more “sexually promiscuous.” This gradual process led to the male partner recruiting their female partner into sex trafficking and using their long-term and community-approved relationship context to coerce her into trafficking.

Normalization and the contextual factor of “groomed by society” (described above) are connected. Many interviewees discussed broader cultural and social trends that pave the way to make recruitment into trafficking easier.

Re-recruitment into Trafficking

Many interviewees discussed how recruitment happens in the context of re-trafficking. We describe this as “what gets you back in.” It was not always clear when an interviewee described what gets you back into a trafficking operation or commercial sex more generally. The process differs from the initial recruitment because people with experience in trafficking know more and recruitment based on fraud or glamour do not work the same. Interviewees suggested that recruiters use whatever tactic they deem most effective based on a victim or potential victim’s current vulnerabilities and circumstances. According to our data, there is significant overlap in some of the mechanisms used to recruit victims initially and to re-recruit victims, specifically basic needs not met and belonging. Re-recruitment differs because a victim’s past experience of trafficking affects not only what vulnerabilities are present, but how a past victim or survivor responds to their circumstances. Re-recruitment mechanisms are just as dynamic as the vulnerabilities and circumstances that a potential victim may be dealing with.

The primary driver of re-trafficking according to interviewees is due in part to a past victim not being able to meet basic needs. These needs could be an ability to pay rent, buy food for themselves or children, or be able to afford substances that they may rely on. One interviewee described it like this:

“I would speculate that it's that it can be easy and one because that person already knows and how to do it. They know they have their johns, or their buyers that they're just like, yeah, if I text them right now, he'll meet me here, you know, so it's kind of, if you don't have an ID to get a job, the fallback is knowing what you know how to do. And so, yes, I--that's why I think it was so, you would see people with ebbs and flows, it's like, because sometimes they just don't have the resources or means to quite literally get out even if they want to. [...] You know, just life, life gets hard. You can't make your bills, you can't feed your kids like, well, what are you going to do? And it's quick money. It's kind of like all these things go hand in hand, you know?” - Social Service (MR027)

Many mentioned that the need for money is a significant factor that drives re-recruitment. Survivors go from having their needs provided for to some degree while being trafficking to not having that “fast money.” This is particularly acute when a survivor leaves a trafficking situation but is then without basic needs or the means to make a living. This change in circumstance can make a recruiter’s tactics more appealing because of this need.

“I think part of it is definitely that where there's something that themselves or their family needs money for, that's a trigger to go back. Another one is just that the, some of the traffickers or their people might reach back out again, and make all kinds of seductive, charismatic promises and, and basically lure them back in.” - Social Service (MR011)

Another driver of re-recruitment is lack of emotional support a survivor may have after leaving a trafficking operation. This includes relationships with other survivors or current victims in tandem with their economic situation after leaving a trafficking situation. Multiple interviewees mentioned that survivors might return to a trafficking situation due to relationships they have with other victims or the trafficker themselves. The following responses from interviewees illustrates some of the environmental factors that affect the re-recruitment.

“Sometimes they knew what they were walking into, but sometimes that was a lot safer than being out on the streets, being alone, especially in a situation where there's other girls there that they had connections with that they trusted. They sometimes went back for those that connection piece... it can be the relationships that they have with other individuals with other women that are being trafficked.” - Social Service in Law Enforcement Agency (MR017)

“... that trauma bond, that fast money, that's usually what I hear folks returning for is like, the money was fast. And like, I know how to numb myself, I'll just, you know, I need that money for, for this, for that.” - Social Service (MR009)

Another interviewee said that social service approaches that tell people what to do are not listening or truly seeing a survivor and that this approach could push people back into a trafficking situation. While trafficking causes significant harms, recruiters and trafficker work hard to make a potential victim feel wanted and special. For a survivor that is looking for that sense of belonging and connection, re-trafficking can work. This interviewee with lived expertise echoed many others who advocated for viewing and treating survivors as humans rather than only victims.

“You know, my, both of mine had different times in different ways that they spent hours with me, not talking, not interrupting me, not trying to fix it at that moment, but taking it in. I mean, now I realize, like, okay, they were using that for their benefit. But, being a person who has had, who had had a lot of like social workers, or even my parents or different people who just weren't doing that, that felt good, like to feel heard. And so those are things that I always try to tell agencies, shut up. Listen, like, you don't need to fix it in your first few sessions, just show up, let them talk, like, you know, engage, but like, don't come with your advice, don't come with your judgment, put all that aside, and just listen to what they have to say, like, build that rapport with them. Like, have pimp

mentality, you know. What would a pimp do? They're gonna take the time, they're gonna think it through, they're gonna, you know, take the point to make that person feel like they're the only person they're talking to, even though they're probably not. And that's what we need to start doing, we need to make our clients feel like they're our only client.” - Lived Expertise and Social Service (MR013)

Recruiters utilized these circumstances and vulnerabilities to their advantage and employed social tactics, many of which they had established while the survivor was still a victim within their operation. One interviewee pointed out that the language surrounding a victim’s “return” to the life may be too generous on the part of the recruiter.

“I used that word would return to them in, that's almost, it's almost giving too much. It's almost giving too much control to them. Like I don't, I don't, I don't think that they consciously just always make this choice to go back. It's just that the grooming the manipulation kicks in” (MR023).

It is clear that recruiters utilize this manipulation as a long-term means of control. One interviewee mentioned fear of retaliation as well as traffickers staying in contact with victims while they are in jail as a method of control.

“Then you also have the fact that he’s gonna keep writing you and calling you and trying to control you from jail. But I do know people who have gotten out and then when they, the other person went to jail, get out, they're back in it or getting pressured to get back to get back in it or scared for [their] life.” - Lived Expert and Social Service (MR033)

Additionally, because of the consistent abuse and victimization that survivors often experience within a trafficking operation, it is often hard, if not impossible, to reintegrate into society without the proper support and resources. This social barrier creates a circumstance in which it is easier to return to a trafficking operation. Further, stigma and shame also present pathways back into re-recruitment. Interviewees provided extensive detail about how stigma keeps people trapped in trafficking and can lead to re-recruitment. As one interviewee said:

“Like, that's what someone else say, oh, you know, her, she's 'that way'. That's coded language to say like, she's a whore. Right, basically. And people will treat her differently, treat her children differently. Access to services are different, like, everything's different in that way, even though she is the victim of violence.” - Social Service (MR026)

Another interviewee directly described how stigma leads to re-trafficking.

“Let's say the humiliation, the shame, everything that goes with already having been victimized, it's like, well, I'm already you know, piece of crap. So, I might as well make money doing it type thing. So, I think it just results back to they've already had everything stripped from them. And they, they feel like they don't deserve any better.” - Law Enforcement (MR021)

On a systemic level, many interviewees discussed the barriers and shortcomings of supportive services to address the needs of victims after they exit a trafficking operation. Many interviewees named the “social service runaround” that many survivors experience as a form of re-victimization. One person described the barrier that a lack of immediate and guaranteed services presents to someone leaving a trafficking operation in the first place.

“And you're just kind of stuck. Like your option is stay and do this, where I have these needs met, or leave into the unknown, not knowing if you'll have somewhere to sleep tonight, because let's be honest, I can't offer someone that leaves good shelter. I can't guarantee them a place to sleep tonight. I can't guarantee that that like it'll happen next week. I can't. Those are things that I just don't have the opportunity... And there's a girl that she, her trafficker had a house, they lived in a house, she showed up in an Escalade she had all these nice things. And I'm like, hey, if you leave today, I can put you in the Super Eight that has broken windows. Like we don't have good options for survivors to leave.” - Lived Expertise and Social Service (MR004)

Interviewees said that services were not sufficient for the survivor or not accessible. Further, for many survivors a criminal record barred them from accessing some services while others were not able to have continuity in their needed care, leading to them being more vulnerable for re-recruitment. Here is one example.

“I still need food stamps for probably another year and so sometimes those county-based services or state services have good intentions, but again, can keep people right there, because they need those services a little longer.” - Social Service (MR016)

In addition to services not being able to address survivors’ needs as a way to prevent re-recruitment, survivors are vulnerable to having unresolved past trauma that increases vulnerabilities and opportunities for re-trafficking (Baird & Connolly, 2023). This interviewee summarizes the many interconnected systemic and interpersonal barriers can contribute to increased re-recruitment.

“They haven't worked through like the trauma or they haven't healed through all of what got them there the first time, I guess. And then I also think sometimes, like, so, we see a lot with... with our youth who are maybe really heavily involved in substances. Um, this is pretty common that they get ready to leave just like very similar with getting sober, like you're ready to leave, you're ready to not use anymore. And then once it gets really hard or starts getting really tough, you're like, nope, I don't want to do this anymore. This isn't worth it. Like, um, or going to the hard place of like, this is what freedom is supposed to look like? Like, this is horrible. This is terrible. Like this is, I don't fit in anywhere. I don't have any money, at least before I had, you know, maybe a quote family or I had a place to stay. I guess staying, sometimes it's like, I guess staying at a trap house is better than saying nowhere.” - Social Service (MR010)

Interviewees also highlighted the stigma that is associated with receiving services or not being able to meet basic needs. This also can create a pathway to re-trafficking.

Taken together, our data on re-trafficking leads to some troubling and concerning conclusions. After leaving a trafficking situation, our interviewees suggest that most survivors do not have the ability to meet their basic needs. They also lack access to long term system support for recovery, including housing, mental health, community connections, and more. All these system and social failures lead to re-trafficking. Even further, some interviewees suggested that traffickers might be better able to meet the basic needs of survivors, even while causing harm through coercion, violence, and manipulation. This is a strong indictment of our current system.

Recruitment is a Process

When we bring all the above data together, it is clear that the function of recruitment (including re-recruitment) into a trafficking operation is a process. Using a variety of thematic codes, we were able to develop a visualization of this process. Figure 5 displays the process and each component of the recruitment process is described below.

What Gets You In

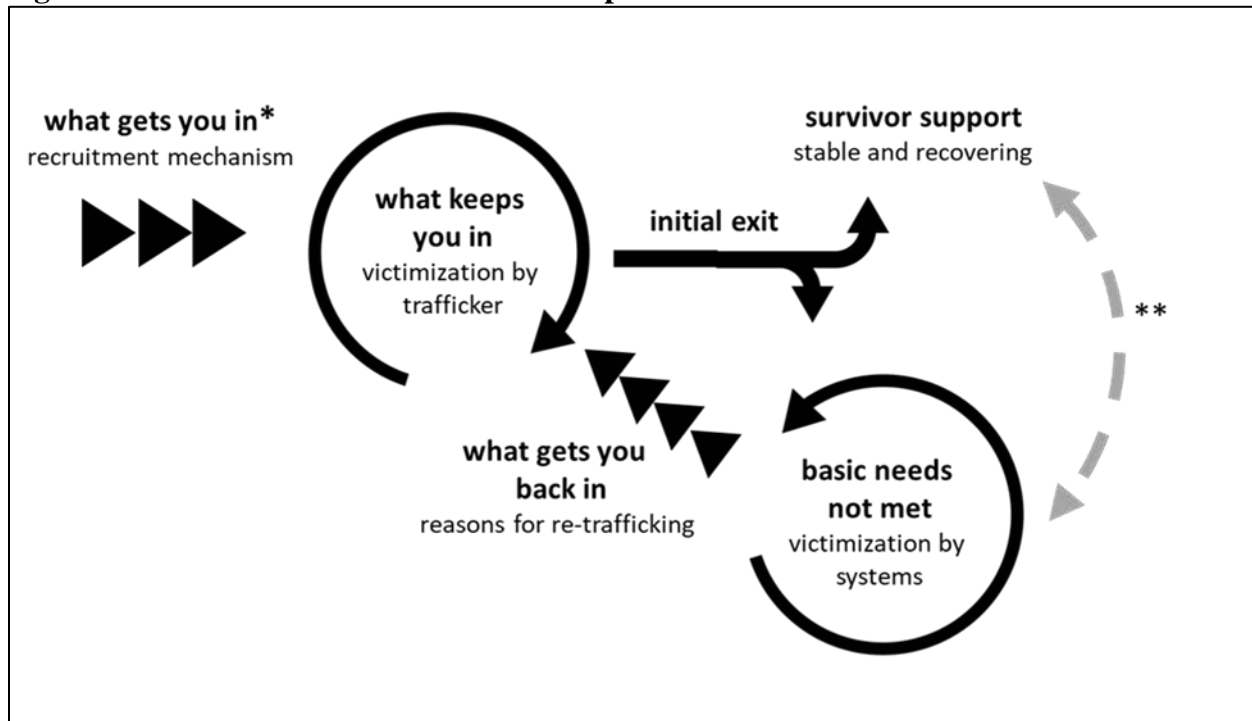
As described above, this component is a combination of vulnerabilities and circumstances that make a potential victim visible to a recruiter, who *may* then spend time cultivating a relationship with that potential victim to play upon or exploit their vulnerabilities. In some cases, the site of recruitment *may* influence who plays the role of recruiter in a trafficking operation; for example, peer recruitment in juvenile detention facilities necessitates the deployment of youth trafficking victims to recruit new victims within those facilities.

What Keeps You In

Once a recruiter gets an individual into a trafficking operation, the trafficker and their associates use continual victimization tactics to keep that individual in the operation, such as coercion and isolation. Manipulation may occur through verbal threats, physical or sexual violence, and taking advantage. While this is not recruitment per se, it does lay the foundation for future re-recruitment. One interviewee described it like this:

“So it starts off little threats, like kicking [the victim] out, then it slowly progresses into okay, I'm gonna kill your mom. Or if you don't do this, I know where your sister lives, or, I know you love your dog and threatening that and then it slowly... If this, the person doesn't get that money, it becomes more of a domestic and physical” (MR019).

Figure 5. A visualization of the recruitment process



*NOTE: *indicates that this component is visualized Figure 4. **indicates that this is a relationship the research team hypothesizes based on our data.*

Initial Exit

A combination of factors can precipitate a victim's exit from an operation including a critical incident, external intervention, and internal motivation. Examples from our transcripts of this include pregnancy or childbirth, police intervention, and an internal decision to leave, respectively. Once an individual exits a trafficking operation, our interviewees stated that survivor support is necessary to prevent re-trafficking back into a trafficking operation. This highlights one of two pathways. A person could receive adequate and long-term survivor support. Thereby having an opportunity to improve their life circumstances and potentially disrupt re-recruitment strategies. The second, and more commonly identified pathway, is that after exiting a trafficking operation the person ends up in a situation where their basic needs are not met. They experience what many interviewees described as victimization by systems (described more below).

Survivor Support

Survivors who have exited trafficking operations need immediate access to support services so that they have time to process and heal as they work to re-establish a life outside that operation. Peer support is essential as it comes from those who share experiences and understand the challenges survivors face. One interviewee's discussion on the importance of having survivor-based services illustrated this.

“But I’ve often been told that it’s like, you guys just don’t get it. And if you don’t get it, we’re never really going to be totally open about those things. Because there’s always going to be a fear of judgment, and not being able to really just put yourself out there.” - Social Service (MR008)

Survivors must also have autonomy to make their own decisions, as there is not one single timeline for healing and recovery. Many interviewees, especially those with lived expertise, described how the current provision of services and supports does not meet long-term needs on the journey to stability and recovery. Survivors of trafficking need time to heal and services do not often provide a long duration of support. Interviewees also discussed the need for autonomy and choice for survivors to determine for themselves when, how, and what services and supports they need. Other interviewees, particularly from Native communities, talked about the importance of reconnecting with culture as a form of long-term support that is part of a healing journey.

“What brings somebody back, I never know what’s going to be it for somebody, but it’s amazing to see, you know, like, once you like, if you grew up chaotic and your family grew up chaotic once you remove that veil of like chaos, and like actually start teaching and walking with them and explaining things and, you know, taking into those healing ceremonies and things that we have here in our community, like, I swear, they’re never going to be the same again, you’ve exposed them to something different. But it’s a thin window, and I’ve lost kids like forever, because I couldn’t, I couldn’t produce that fast enough, you know, those moments, which is hard. [...] Rebuilding this community, you know, to what we, because we’ve had systems before, you know, this isn’t some dream of ours, this is actually something we had, which is hard to convince people that, you know, that were taught negative about us, you know, of themselves.” - Social Service (MR027)

Interviewees also noted that this is a protective factor and a form of generational strength in the face of colonization. Some interviewees also mentioned faith or religious practice as a similar source of strength and healing over time.

Some interviewees described the long-term needs associated with the co-occurring issues of substance use and sex trafficking, as well as involvement in other criminal activities as part of the trafficking experience. One interviewee summed this up as follows:

“[R]ecovering has been a method and a way that I’ve seen folks get out. I’ve also seen commitment to children and wanting to take care of their kids is a way for them to get out. I would say, definitely services in different ways that could be, again, treatment, mental health services, and housing, employment. And then, and having a network or a group with folks that have same or similar experiences, and being able to process that scene representation of folks who have gotten out has also been inspirational, and critical, as part of a healing network for people to get out as well.” - Social Service (MR031)

Basic Needs Not Met

Individuals who have exited a trafficking operation sometimes face challenging re-entry experiences that result in their basic needs not being met. Conflicting and complex application requirements can cause survivors to engage in a time- and energy-consuming social service runaround that may still result in a denial of access resources. The quote below exemplifies the social service runaround.

“So we drive to the building, we drop it off, they have a drop box that says, you know, like, this is where you put your paperwork, she put her paperwork in there, and I was like, I'm here, I'm a witness, I'm going to sign the top of it and say, caseworker submitted on this date, because you don't know what's going to happen. It went in the box. And it was received late by the worker, even though we turned it on in the day that it was due, and she lost her public assistance.” - Social Service (MR002)

Criminal records, shame, and blame may also become barriers for survivors trying to access services such as housing or applying for a job.

What Gets You Back In

Survivors whose basic needs (food, shelter, supportive relationships, etc.) are not being met may decide that the most viable option for survival is to return to the trafficker/operation that victimized them. However, immediate access to reliable and consistent support services may aid survivors on their journey to recovery and may dissuade them from feeling the need to re-engage with their trafficker/operation.

Conclusion

In this section, we described seven interconnected recruitment mechanisms that recruiters use to identify and recruit victims. A recruitment mechanism uses a relationship between the recruiter and potential victim, combined with a tactic (e.g., glamour), that may happen in a specific location (e.g., a party). The recruitment mechanism is just the tip of the iceberg. We also described how recruitment mechanisms feed into a much larger system that keeps victims in a trafficking operation and supports re-recruitment. More troubling, interviewees suggested that our current system for helping survivors of trafficking is woefully inadequate and this causes harm and is a feeder into re-trafficking. Figure 5 provides a conceptual model to visualize this process.

Research Question 3a: Do recruitment networks offer the potential for effective intervention and interdiction to disrupt sex trafficking operations?

According to our data, recruitment networks offer the potential for effective disruption of sex trafficking operations. However, perhaps not in ways that are most obvious. While it is morally and ethically imperative to help people escape trafficking situations, the cycle described in Figure 5 suggests that merely removing a person from a trafficking situation is not sufficient to prevent re-recruitment. It is critical to help victims exit or escape a trafficking situation and to

hold perpetrators accountable, yet our data suggest that more lasting prevention of trafficking and re-trafficking lies in disrupting the ability of trafficking operations to recruit victims.

As described above, we found that recruitment happens in the context of relationships and that it is a process. These relationships thrive in a context of scarcity, lack of belonging, and socio-cultural norms and conditions. Disruption opportunities, according to our data are located in the deeper root causes that underpin the recruitment process for initial recruitment and re-trafficking. The components of Figure 5 offer a direction into potentially effective disruptions of recruitment.

The recruitment tactics we described above typically unfold in a broader context of lack of basic needs, structural inequities, prior abuse, and other hardships. Tackling the problem of basic needs provision could disrupt the underlying mechanisms of “what gets you in” and “what gets you back in.” Similarly, provision of appropriate and long-term support for survivors, could disrupt the cycle of recruitment to re-trafficking. Figure 5 describes a pattern where people who leave trafficking situations are victimized by societal systems set up to support them, experience difficulties accessing and obtaining social services, and generally are left without support. This makes people who have experienced trafficking vulnerable to re-trafficking or re-engagement in sex trading. Interviewees suggested that one mechanism leading back to being trafficked is familiarity; it provides more certainty about what to expect (e.g., “the devil you know”) and is a way to survive. Providing basic human needs and eliminating harms caused by the criminal justice and social service systems could disrupt the power of recruitment networks that facilitate re-trafficking.

Interviewees provided ideas for prevention that could lead to disruptions. Most interviewees stated that starting young and educating youth was a core element of preventing recruitment. Many said that teaching youth about consent, healthy relationships, not talking to strangers, internet safety, and having inclusive sex education (inclusive of LGBTQIA+ identities) were all important topics to prevent youth from being vulnerable to recruitment. Interviewees, including law enforcement, mentioned that educating parents on what trafficking can really look like and encouraging conversations about it as well as monitoring youth’s activity online was an important intervention. There was also discussion about how law enforcement officers, hotel staff, medical staff, and others who might interact with victims should be educated on signs of someone being trafficked.

Some interviewees suggested that a good way to disrupt recruitment could be to understand why and how traffickers become traffickers and seek to disrupt that process. For example, one person, talking about familial trafficking, suggested that trauma leads some people to become traffickers.

“I think that what I see is substance abuse is a symptom, obviously, of trauma. And a lot of communities are experiencing trauma. A lot of individuals obviously are experiencing trauma, but then we have so many different things that are traumatizing people, whether it's historical trauma, whether it's like systemic racism, whether it's like living in poverty, any of those different things. So like, how do we address all of those different things and, and create communities that care, I think, is important, too, because we look at so much of it, like, you did this, this is bad. You're a bad person, which like, obviously, this is like, selling your kids for sex is super terrible. But how do we also take into account that like, you've experienced harm, too, and we need to provide you with critical resources? I don't

know. Like, maybe we just create a restorative justice. I don't know.” - Social Service (MR002)

Similarly, another interviewee suggested that traffickers and victims often come from the same communities and contexts.

“Because if we look at community and the whole ecosystem, why is the trafficker trafficking, and we know that they're usually coming from the same environments that make victims and survivors at risk for, for being trafficked. So, I think that we have this whole prevention thing that we could do that, you know, women's and children's bodies are not commodities, and that what can we do that provides everybody with access to economic stability and opportunities to thrive is kind of a big question, a bigger question and how we do that.” - Social Service (MR031)

These disruption ideas are just a starting point. One of the contributions of this study is to connect the conceptual model that came from interviews described above with a computational model to examine how changes to the deeper roots of recruitment might influence the life course trajectory of potential victims of trafficking. The next section explores our findings from the Markov Chain model in two ways. First, we account for the range of factors that make a person susceptible to recruitment and organize them into specific states and pathways within the Markov Chain model. Then we examine how the Markov Chain model can help us assess the impact an intervention might have on the underlying susceptibility to being recruited into sex trading or trafficking by modeling a hypothetical housing intervention. It was beyond the scope of this study to model an actual intervention or set of interventions.

Future work could combine the Markov Chain model with a resource allocation model to provide decision makers with insights into the most effective combination of interventions to reduce sex trading prevalence and decrease susceptibility while adhering to resource constraints. Data constraints are a limiting factor since a resource allocation model would require detailed information about an intervention (or set of interventions) such as a budget, effectiveness, and population served. From our data, it seems clear that interventions to prevent the initial recruitment of a potential victim offer the most opportunities to disrupt rather than displace sex trafficking crime.

Research Question 3b: If so, how can we create mathematical models to capture the cascading impacts that disrupting recruitment may have across the operation?

The Markov Chain model we have developed shows that it is possible to mathematically model the impact of disrupting recruitment into sex trafficking. The model provides an opportunity to visualize the complex life course pathways potential victims, victims, and survivors travel based on their susceptibility to recruitment into a trafficking operation. Further, the Markov Chain model allows us to test the effect of interventions to prevent human trafficking in a realistic, simulated model environment prior to implementing such interventions in reality. This analytic tool is especially useful to determine which set of interventions to implement when it would be costly and infeasible to implement and evaluate all possible interventions.

In the methods section, we presented a simplified and complex version of our Markov Chain to model changing susceptibility to recruitment into sex trafficking and sex trading. The simplified version references sex trafficking as the focal outcome because this was the initial aim

of this study. The methods described how we built a more complex version of the Markov Chain to model susceptibility conditions and pathways between states specifically for youth in the child welfare system. We also provided guidance about how this choice of population affected our language and focal outcome. For the remainder of the results, we use the term “sex trading” rather than “sex trafficking.” Although the TVPA defines youth under age 18 who engage in a commercial sex act as victims of trafficking, use of this term potentially conflates many different types of experiences. For clarity’s sake, we use the term “sex trading” because it is more general, and it encompasses survival sex, sexual exploitation, and third-party trafficking.

The Markov Chain model we developed allows us to measure and investigate two metrics. First, we can examine the transition probabilities between states to model the likely scope and scale of involvement in sex trading and other life course experiences among youth in the child welfare population. Second, we can model a hypothetical housing intervention to determine what effect an improvement in housing may have on the transition probabilities into and out of sex trading. This includes initial recruitment and re-recruitment into sex trading.

The work presented here is somewhat speculative due to data limitations. Yet, the Markov Chain model we present is adaptable and modular. With new and improved data, future work can refine, add, remove, and improve the states, pathways, and transition probabilities. It can be used to investigate other metrics or interventions if more or better data is available in the future. It is important to note that the answer to this research question relies on both the Markov Chain model and the data collected to populate it. We discuss each of these now to help answer this research question.

The Markov Chain Model

In this section, we demonstrate that our model can be used to capture the cascading impacts of recruitment disruption. Specifically, we provide an example that explores what would happen to transition probabilities if we added additional sustainable housing options for survivors to the system. Since we are not modeling a real intervention, we developed assumptions of effectiveness of a hypothetical intervention based on a quantification estimation approach applied to the expertise of the qualitative researchers and advisory group. The collected data was refined, while keeping the core observations intact, so that it reflected known data (e.g., Tueller et al., 2022) in the literature about the experiences of youth trading sex. This is described in the Methods section.

A longitudinal data set is needed for more accurate and specific quantitative figures, but as aforementioned, such data is lacking in the trafficking literature. Likewise, we did not have access to precise outcome or cost data for any specific intervention. Thus, the example we provide is hypothetical and illustrative, yet very easy to modify if longitudinal data is available. In the absence of clear data, our approach allowed for a collection of initial estimates on the likelihoods that a person would move from one state in the Markov Chain immediately to another state in the Markov Chain.

To evaluate the impact of the hypothetical housing intervention, we must first evaluate the Markov Chain model that reflects the system of recruitment into sex trading prior to the housing intervention. Table 7 shows the transition probabilities for the pre-intervention model using the process described in the Methods section. Specifically, Table 7 shows the pathways and transition probabilities from low, medium, and high susceptibility states to the other states including other susceptibility states, sex trading, institutions, and the absorbing states (e.g., passing away or leaving the susceptibility cycle). For example, consider 100 youth who are in a

low susceptibility state prior to the hypothetical housing intervention. Table 7 indicates that for 40 of these youth, the next time their situation changes, their susceptibility to trading sex will decrease even further and they will transition out of the cycle of susceptibility. Additionally, 49.9% of youth (or approximately 50 out of 100 of the youth) currently in a low susceptibility state would be expected to transition to a higher susceptibility state next. Note that all the probabilities in each column (i.e., for each susceptibility level) add to 100%.

Multiple assumptions in the design of the Markov Chain can be seen in Table 7. These assumptions are described in the Methods section. For example, a person can only transition into the absorbing state representing that all of the person's needs are met and that they have developed strong support and coping mechanisms if the person is currently in a low susceptibility state. Therefore, Table 7 shows that "Exit: Very Low Susceptibility" can only be transitioned into if the person is currently in a "Low susceptibility" state (and displays 'NA' otherwise).

Additionally, we assume that a person's housing, mental health, or substance use situation changes one at a time. For example, if a person loses their housing it is reasonable that their mental health may be impacted. According to our assumption, the person would first transition into a lower housing stability state and then also transition into a state indicating more mental health challenges. Thus, a person's housing and mental health situation can change in a short period of time, but we assume one happens before the other, even if it is only shortly before the other. This is important because it dictates which transitions are possible between states of the different susceptibility levels listed in Table 5. For example, Table 5 lists two medium susceptibility states: a state representing using substances but having stable housing and adequate mental health (State 2), and a state representing having poor mental health but having stable housing and no substance use (State 3). Since transitioning from the former state to the latter state (or vice versa) would require a simultaneous change in both the mental health and substance use status of a person, it is not a valid transition in our model. Therefore, Table 7 has a "NA" in the "Medium Susceptibility" to "To Similar Susceptibility" category. A person could however transition from one high susceptibility state to another high susceptibility state. For example, someone who is experiencing homelessness, has mental health issues, and a substance use disorder (State 8 in Table 5) may transition to a state where they are homeless and have mental health issues, but no longer have a substance use disorder (State 7). Although they have improved their situation, they are still in a high susceptibility state according to Table 5.

Table 8 shows how the transition probabilities changed after implementing a hypothetical housing intervention based on a quantification estimation approach applied to the expertise of the qualitative researchers and advisory group. Since this is speculative, we were conservative in the impact the housing intervention would have on the transition probabilities. Thus, we opted to err on the side of underperformance.

Results from the Markov Chain Model

From these input data our model allows us to calculate general system performance measures, referred to as hitting probabilities¹ and absorption probabilities in mathematical terms

¹ Our team was cognizant that the mathematical term 'hitting probability' may be triggering for some people because of the dual meaning of physically hitting someone. Therefore, in conversations within our team, including with our survivor-centered advisory group, we refrained from using the term. This experience illustrates the importance of transdisciplinary work and critically assessing the harms some academic or technical terms may have on different audiences.

(the mathematical details of which are presented in Appendix 5). A ‘hitting probability’ refers to the likelihood that a person within the Markov Chain will ever ‘hit’, or visit, a particular state of the Markov Chain if they are currently in another state. For example, Figure 6 displays the likelihood of victims or survivors of ever trading sex (or trading sex again if they are currently survivors) in the boxes below the green states. Our results indicate that a person who has never traded sex and is currently in a highly susceptible state has a 16% chance of ever trading sex. The hypothetical housing intervention we considered focused on providing additional housing access for survivors. Two numbers are shown for the states representing survivors who are currently out of the life; the left-most number represents the probability for survivors to eventually be re-recruited into sex trading prior to the housing intervention, and the second represents the probability after the intervention. The propagating effect of the housing program can be seen for these states. For example, the likelihood that a survivor with a high susceptibility will be re-recruited into sex trading decreased from 33% pre-intervention to 31% post-intervention.

Table 7. Transition probabilities prior to a hypothetical housing intervention

From	Low Susceptibility	Medium Susceptibility	High Susceptibility
To			
Exit: Very Low Susceptibility	40%	NA	NA
Exit: Still High Susceptibility	NA	NA	26%
Pass Away	0.1%	0.2%	0.3%
Trading Sex	5%	6%	15%
Incarceration	3%	4%	8%
Other Institution	2%	4%	5%
To Lower Susceptibility	NA	50%	12%
To Similar Susceptibility	NA	NA	33.7%
To Higher Susceptibility	49.9%	35.8%	NA
Total	100%	100%	100%

The second analysis we conducted was to investigate how this hypothetical housing program might affect the exit points for the people who are currently trading sex. Mathematically, this is done by calculating “absorption probabilities.” In Figure 7, the orange oval represents people who are currently trading sex. Blue ovals denote the states to which a person trading sex can move and thereby leave the system. Numbers below these states again show the before and after likelihoods. For example, prior to the intervention, we would expect 45% of people who traded sex to still have challenges with their housing, mental health, and/or substance use when they eventually exit the Markov Chain (i.e., the sex trading recruitment system). However, implementing the hypothetical housing intervention is estimated to improve the outlook for more people, resulting in an estimated 38% of survivors exiting the Markov

Chain while still struggling with housing, mental health, and/or substance use. Additionally, the model estimated an increase in the percentage of survivors whose basic needs are met and who develop strong, long-term support networks (from 29% pre-intervention to 37% post-intervention).

While the hypothetical housing intervention yielded only a few percentage points reduction in re-recruitment likelihood (see the hitting probabilities in Figure 6), it resulted in a more drastic change to the way survivors exit the system (see the absorption probabilities in Figure 7). This means that the hypothetical housing intervention facilitated exits from the susceptibility cycle represented by this Markov Chain model in ways that are more desirable (i.e., leaving with a strong support system and all needs met vs. leaving with housing, mental health and/or substance use issues). This finding suggests that housing stability could lead to substantial life changes for the better, even though these impacts may not be immediately evidenced in initial transition probabilities. Thus, our hypothetical example provides insights for practice. Our model shows that it is important to look at interventions as part of a larger system.

Table 8. Transition probabilities after a hypothetical housing intervention

From	Low Susceptibility	Medium Susceptibility	High Susceptibility
To			
Exit: Very Low Susceptibility	44%	NA	NA
Exit: Still High Susceptibility	NA	NA	26%
Pass Away	0.1%	0.2%	0.3%
Trading Sex	5%	6%	15%
Incarceration	3%	4%	8%
Other Institution	2%	4%	5%
To Lower Susceptibility	NA	55%	17%
To Similar Susceptibility	NA	NA	28.7%
To Higher Susceptibility	45.9%	30.8%	NA
Total	100%	100%	100%

Conclusion

The Markov Chain modeling demonstrates the necessity of a systems modeling approach to capture the cascading effects of an intervention rather than only looking at immediate or short-term impact. Our work on identification of disruptions is still speculative and hindered by lack of data. Yet, it shows a promising approach to thinking about disruptions. Future work could use the Markov Chain model to explore the possibilities of many different types of interventions aimed at reducing susceptibility to recruitment into sex trading or trafficking. Furthermore, the survivor-centered advisory group found the Markov Chain approach very useful for explaining the complexity of pathways in survivors' journeys. In particular, they felt it could help survivors

work through internalized shame and stigma related to re-trafficking or re-engagement in sex trading. Our work makes clear that without addressing the underlying dynamics behind recruitment, interventions are not likely to be successful.

Figure 6. Impact of hypothetical housing intervention on probability that a survivor in a state will eventually trade sex again

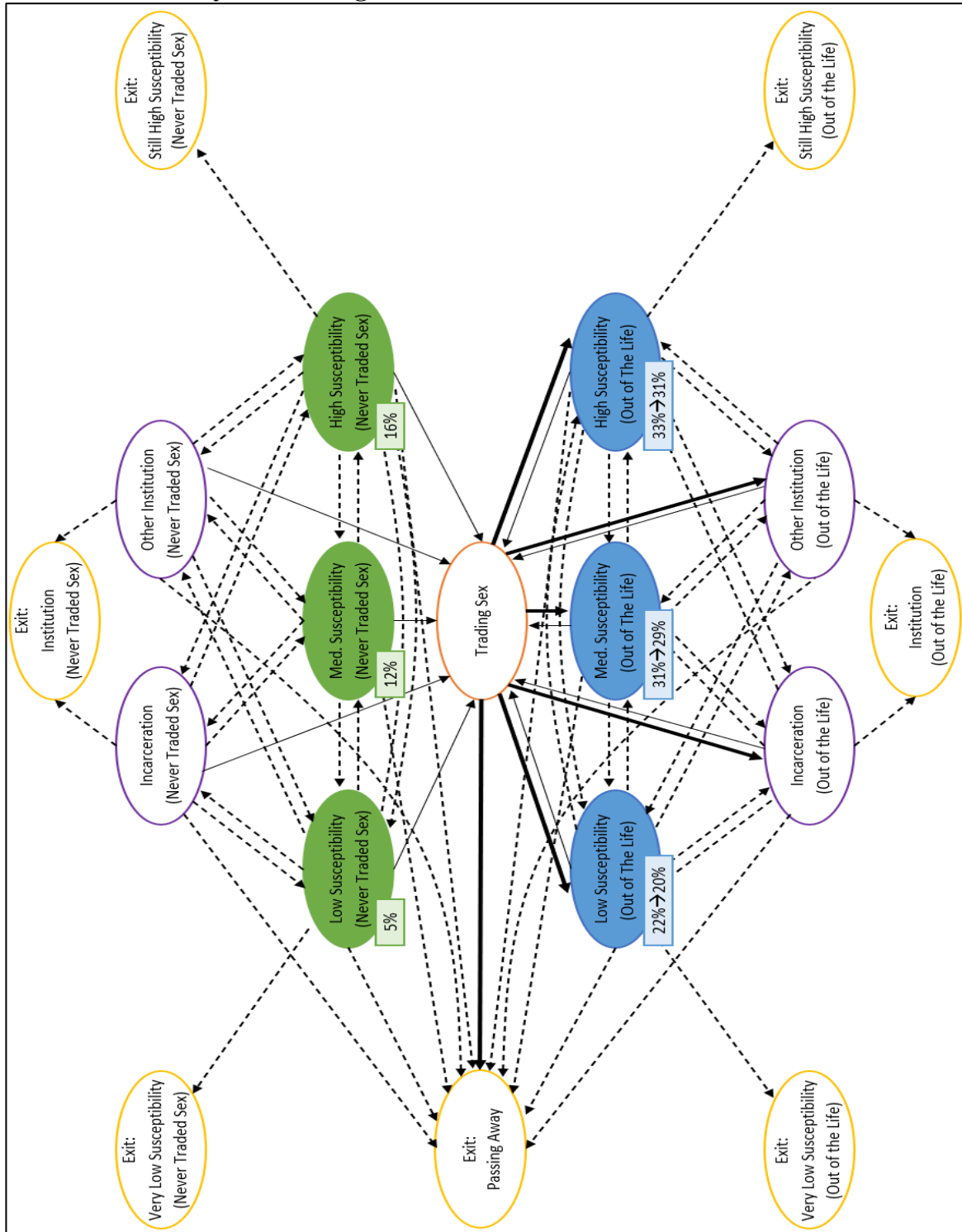
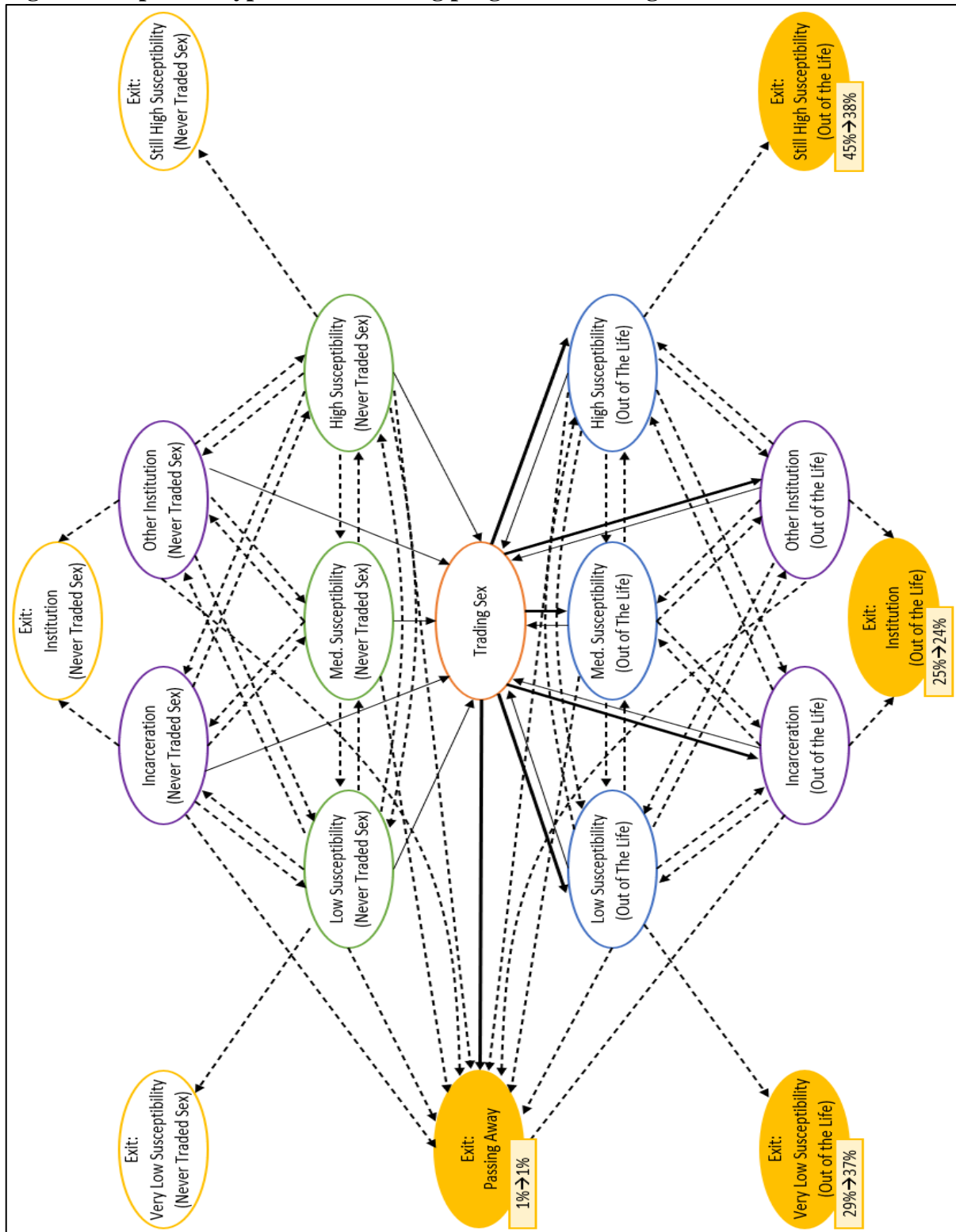


Figure 7. Impact of hypothetical housing program on exiting



Research Question 4: What are the unintended consequences and ethical implications of disrupting recruitment networks? Can mathematical models capture these unintended consequences?

In a project such as this, there are necessarily going to be unintended consequences of the work and findings as well as ethical implications. Our team raised, debriefed, and reflected on ethics and consequences as they arose. Here we describe four primary areas of extensive consideration for our team.

Modeling Something so Complex

Sex trafficking and sex trading are complex issues. It is not possible for computational models to capture the full range of variation, all of the harms, and the nuances of individual journeys. The process of developing a math model necessitates abstraction. The transdisciplinary process required that our qualitative team gather insights from experts and that the survivor-centered advisory group provide their guidance as well. In the context of trauma and pain, abstraction can feel harmful or disrespectful. We identified potential ethical challenges in asking stakeholders, including people with lived experience, to think in terms of networks and generalized abstractions. Some project participants seemed to think this way already and were able to share that knowledge without distress. Some participants could easily provide abstract information, and our questions seemed to align with the ways they naturally thought about things. Others were much less comfortable generalizing, preferring to tell individual stories to convey their points. Both approaches yielded very important information for this project. To support participants, we followed the lead of stakeholders and allowed them to share information in the way that felt most comfortable to them. We also found that acknowledging the pain and hardship of abstraction helped. Additionally, our team offered space for participants to debrief, pause, and reflect as a way to help them process if needed. Future projects seeking a system view from stakeholders should be prepared to provide this kind of support and a trauma-informed process.

The survivor-centered advisory group highlighted the necessity of reckoning with this complexity in order to make the experience legible to a broader audience. For example, they expressed their belief that findings from this project will cast a light on the complexity of sex trafficking. The survivor-centered advisory group expressed their belief that the Markov Chain model accurately reflects the winding pathways that survivors travel. Here are a few quotes from our meeting on July 24, 2023 when we discussed a draft of the ethics of this report. One person said, “I think this report is going to open the eyes of the people in the big fancy houses with the white picket fence.” Another said, “You get attorneys but they don’t really know what’s going on in the streets and this could be helpful to them.” This drives home our ethical obligation to disseminate report findings widely to many audiences.

Inclusion of Lived Experience Experts

It is critical to include lived experts in research on human trafficking because they are essential knowledge-holders. Members of the survivor-centered advisory group for this project incorporated lived expertise at every step of the project including co-authorship on publications and dissemination of findings (e.g., Martin et al., 2022; Sharkey et al., 2024). However, participating in research can be triggering, harmful, painful, or difficult. We recognize that lived expertise is knowledge gained through pain. Co-creating the project with lived experience experts required our team to grapple with ethical implications of making sure the process was

supportive, open, transparent, and meaningful. In our project, we incorporated lived expertise through the survivor-centered advisory group and by including lived experts in our key informant interviews.

For the advisory group, we worked together to create a safe space for members to provide information about trafficking operations. The meetings opened with a check-in to make sure we valued and honored how people were feeling that day. We made it very clear that advisory group members were not required to share during a meeting if it was too hard. We also made space for processing emotions as they arose. The person facilitating the advisory group regularly checked in with advisory group members to see how they were feeling about participation before, during and after discussion of project content. We also made sure that advisory group members were prepared in advance of meetings about what was going to be discussed. That way they could make an informed decision about whether or not to participate. Members of this group have indicated that this process, while hard, is also healing because they have a safe space to reflect on their knowledge, build community, and contribute to greater understanding.

The process of developing the Markov Chain model provides an example for how our advisory group works through painful topics. Advisory board members often saw themselves and their own lives reflected in the model. These realizations were both affirming and difficult. They also talked about friends, family, and others they know who had different paths through the Markov Chain susceptibility pathways. Our discussion of the Markov Chain absorbing states was a particularly difficult conversation. In order to create a realistic model, we needed to include a realistic range of absorbing states. Some of these states were positive in nature. For example, someone could leave the susceptibility cycle into a stable life. Unfortunately, many of the other absorbing states were difficult, including death. This was a challenging conversation, especially because this conversation happened at time when the advisory group had lost many friends, colleagues, and clients with lived experience to COVID, the opioid crisis, and murder. Discussion of that absorbing state was personal and real. While painful, this discussion allowed the team to share and grieve together.

Our team moved beyond research *on* victims/survivors to co-inquiry *with* people with lived expertise and community wisdom. It is ethically important to develop practices that support full integration of lived expertise and community perspectives into academic research. Without careful attention and inclusive language, it is possible that advisory groups can tokenize people with lived expertise and minimize or sideline the fullness of potential contributions.

For key informant interview participants with lived experience, we did not have a long-term relationship through which to build a safe space. Instead, we addressed the potential for harm by making sure that all key informant interview participants knew exactly what to expect from the interview protocol. We also made it very clear that we were not asking them to recount their own personal story, but rather to reflect on what they know more generally about sex trafficking operations and the people involved. We discovered very quickly that in relation to lived experts, this interview protocol was best suited for people with dual expertise as a social service provider or advocate. That professional experience provided a container that interview participants could use to share their lived expertise, including their broader knowledge of other people's experiences.

Lived experts were more likely than others to experience the inherent difficulties and potential harms of abstracting lived experience into a computational model. Computational models cannot encompass the entirety of a person's experience nor the fullness of what populations' experience. It necessarily generalizes in ways that can feel painful to people with

lived experience, and those close to the issue. Further, modeling runs the risk of abstracting or minimizing the pain, trauma, and violence inherent in a trafficking experience. Our project was committed to acknowledging this in all of our work and products.

Representation and Inclusion

This project sought to focus specifically on human trafficking for sexual exploitation. There are many other types of experiences in commercial sex that we were not able to include. There are ethical implications for how our focus shaped the model we developed. Our survivor-centered advisory group identify with survivorship and many identify as survivor-leaders. However, there are individuals who have been trafficked who do not identify in this way. Their experiences and contributions to the project may have been different from our advisory group, leading to different assumptions in our computational modeling. Our approach to this consequence was to be clear about what our project encompasses and what it does not. While the specifics of our findings may not be generalizable to all contexts and experiences (no research is), the process we used is transferable and replicable to different settings and contexts.

Likewise, people with lived experience in contexts outside of Minnesota or from different communities may shed different light on recruitment networks. The participants shaped our project, and there are gaps based on people we were not able to include. This is true of all research. We try to address this ethical challenge by being very clear about whose perspectives are present and whose are not. We believe this clarity helps readers understand where and how to place our findings, while leaving open the possibilities for expansion of our work.

Use of Findings

We believe that our research stakeholders can and should use our work to help them make decisions about policy, services and supports, and disruption opportunities. However, there are numerous potential consequences and ethical implications related to use of the qualitative and computational results of this research project. Any application of our findings should take into account the inherent limitations of data and representation that we have described in this report. Because our project and the findings are not representative of all people involved in commercial sex, we must carefully examine disruptions, interventions, or policies that may lead to beneficial outcomes for some populations, but not others. Due to significant data limitations in the field, our work is speculative and hypothetical. Although we believe the decision-making behind the models is reasonable, application to the real world should proceed carefully with close attention to potential unintended consequences.

Interventions could backfire by even further marginalizing people who have been victimized in trafficking. Decision-making that could flow from the Markov Chain model could focus on the maximum number of people who might benefit. If the intervention seeks to help “most” victims or have the largest “return on investment,” they may leave behind the most marginalized people who may experience the most harms. It is important that interventions have a fair and equitable distribution of impact and effect across geography, experience and communities. This is an important area of inquiry and intervention design. Any use of data from this project should carefully examine and weigh the potential benefits and costs pertaining to specific groups.

Our results show that lack of a safety net for victims and potential victims is a powerful driver of susceptibility to recruitment into sex trading and trading. This left many stakeholders and interview participants wondering about the current reliance on law enforcement intervention

to “rescue” victims and hold traffickers accountable. To be clear, no one advocated for not helping victims or arresting perpetrators. Rather, this raised the ethical issues inherent in the tension between our current law enforcement approach and interventions related to providing access to basic needs and sustainable livelihood. There are no simple or straightforward answers.

Interventions focused on “rescuing” victims do not address the drivers of susceptibility to recruitment and re-recruitment. Interviewees highlighted that we lack good options for providing support for people before they are trafficked or after they leave a trafficking situation. Interviewees, particularly from law enforcement, highlighted that individuals removed from a trafficking operation through arrest or “rescue” may immediately return to trafficking because of the lack of a safety net. These interviewees underscored that law enforcement do not know the longer-term outcome of rescue or removal from a trafficking situation—specifically, whether they received support or not. Further, trafficking operations can simply replace a “rescued” victim with a new victim. True disruption will need to go deeper to change the conditions, including social narratives and support systems.

Interviewees also highlighted some ways that detaining or arresting a victim might cause additional harms. Rescuing a victim through arrest or threat of an arrest creates trauma and potentially the collateral consequences of a criminal record. Our findings, displayed in Figure 5, show that a criminal record can contribute to re-trafficking. In short, criminalization creates long-term harms for people and makes it harder for victims to move forward. Law enforcement arrest of traffickers may also carry unintended consequences that leave victims susceptible to re-trafficking. For example, when a trafficker is arrested this creates a short-term disruption of a victim’s livelihood, potentially leaving them without access to basic needs. The arrest in itself, does not address the underlying root causes of susceptibility to recruitment for their victims. Arresting a trafficker or removing a victim from a trafficking situation will not change the underlying susceptibility to trafficking. Thus, an interdiction may leave victims and potential victims in a worse situation.

Finally, members of the survivor-centered advisory group worried that sophisticated trafficking rings could use our results to exploit people. One member said:

“Traffickers could actually take this and create and build so you got the bigger trafficking rings, not your everyday pimp on the street, more of the bigger, so this could be a checks and balances so to have successful running operation.”

The concern is twofold. Our data could provide a roadmap for susceptibility, providing traffickers with more information they can use to exploit people. Second, the information could help traffickers harden their operations so they are less pervious to interdiction.

Integration of Qualitative and Computational Findings

The systematic review conducted by our team illuminated a significant gap in detailed understanding of the initial recruitment into a sex trafficking operation, including the recruiter relationship networks, the mechanisms used (including variations and overlaps), and the overall process (Martin et al., 2023). This study contributes to initial model development about the recruitment process by adding additional details regarding the initial stages. Similar to past research we find that recruitment is a process (Baird & Connolly, 2023; Kulig & Cullen, 2021). We conceptualize how the tactics used by recruiters are shaped by interactions between the type of person doing the recruitment, the location of recruitment, and the unique situation of the

person being recruited. Figure 4 displays this with a visualization of “what gets you in.” We refer to this as the “recruitment mechanism.”

Our qualitative data lead to the conceptualization of the process of recruitment (see Figure 5). We identified distinct differences in initial recruitment mechanisms (“what gets you in”) and the recruitment mechanisms that lead to re-trafficking (“what gets you back in”). Initial recruitment focuses heavily on fraud, glamour, and belonging. Interviewees described these tactics in the context of lack of basic needs, love, or support and they highlighted how the tactics play on the fact that the potential victim does not know exactly what to expect. Familial trafficking is slightly different. Initial recruitment relies on subtle and overt coercion from parents and parental figures as well as expectation and normalization.

Our interviews suggest that after leaving a trafficking situation, people who have been trafficked often find that they are right back where they started prior to being trafficked. In addition to harm suffered prior to and during their trafficking experience, victims often experience uncertain and uneven service provision, challenges accessing social services, and services that potentially cause more stigma and judgement. An uneven or unsupportive post trafficking service ecosystem plants seeds for re-trafficking that are rooted within these negative experiences and barriers. People who have been trafficked know how trafficking works and may see it as a reliable option to survive as compared to an unreliable, unpredictable, and unknown experience post trafficking. These are survival skills. Thus, absent other viable alternatives, people who have been victimized in trafficking are vulnerable to being re-trafficked. In this way, the whole experience of trafficking combined with gaps, inconsistencies and potential harms in the social safety net and services lays the groundwork for re-recruitment and re-trafficking.

In parallel, our team conceptualized and tested a Markov Chain model to visualize and analyze probabilities of being trafficked based on differing levels of susceptibility and life experiences, referred to as “states” in the model. Based on current extant data, our model homed in on the likelihood of involvement in sex trading among youth in the child welfare system. Model parameters reflect that many individuals experiencing conditions that make them susceptible to trafficking and sex trading will not actually be trafficked or engage in sex trading. In the context of scarce data, our team developed a novel approach to developing estimates for transition probabilities between states in the Markov Chain model; including the probability of being trafficked or re-trafficked. We were able to establish provisional estimates to populate the model with data that we used to develop probabilities of transitioning between states. Using a hypothetical housing intervention, we find that provision of housing supports exit from the environment of susceptibility to sex trading and trafficking. This was true for individuals experiencing susceptibility factors who had and who had not traded sex.

The Markov Chain model surfaces the nuance and complexity within the pathways identified in the visual depiction “recruitment is a process.” Qualitative data and computational modeling together confirmed that a lack of basic needs undergirds the entire process of recruitment. “What gets you in” are recruitment mechanisms wielded in a context of lack of basic needs, such as housing. The qualitative data extends this finding to suggest that a lack of belonging, love, and support within a cultural context we refer to as “groomed by society” provides the broader context of specific recruitment strategies. While in a state of being trafficked, qualitative data suggest that what keeps someone in is continual victimization coupled with coercion and a partial fulfillment of needs. After the initial exit, both the Markov Chain findings and interviewees suggested that survivor success requires support, stability, and space to process and recover. Without these supports, survivors may lack of basic needs and experience

what interviewees described as victimization by systems (meaning system runaround or harm). This context provides the groundwork for “what gets you back in”, which are the reasons for re-trafficking.

Conclusions and Implications

Through mixed methods research using qualitative and computational modeling methods, we were able to meet the four project goals and answer the research questions. We addressed a documented gap in knowledge about the *structure and function* of recruitment networks and tactics in sex trafficking operations. We found that recruitment networks are structured by relationships, which can be characterized by the recruiter type, victim characteristics, and the recruitment context (geography, location, socio-structural). Our study contributes to the literature by going beyond documentation to conceptualize how relationships “function” within recruitment networks (Martin et al., 2023).

In terms of function, recruitment mechanisms vary by the recruitment relationship network. We also identified at least seven deeply intertwined recruitment mechanisms, including coercion and force, fraud, belonging, seduction, basic needs, glamorization, and normalization. For example, normalization of commercial sex could be a subtle form of coercion; seduction can also touch on a need to belong. Past literature on sex trafficking has identified, documented, and described some of these seven recruitment tactics we identified. Based on our team’s transdisciplinary conceptualization of recruitment networks, we were able to press beyond noting or describing these tactics to explore how, why, and when they are used and by whom and against whom. This deeper understanding could lead to more targeted interventions to prevent recruitment efforts and promote resilience against recruitment.

We also found that recruitment occurs within a broader context of structurally induced scarcity, normalization of commercialized sex, and broader socio-cultural factors (e.g., consumerism and materialism, growth of the internet). Importantly, we identified that there is a distinction between initial recruitment and re-recruitment into trafficking. What gets someone in to trafficking is different from what gets a person back into a trafficking situation. The seeds of re-recruitment interweave throughout the trafficking and post-trafficking experience. This theme is echoed and confirmed by our Markov Chain model.

Our study specifically sought to understand the initial recruitment phase of trafficking. Yet, interviewees had a lot to say about how re-recruitment leads to re-trafficking. Almost of the transcripts discussed the ways trafficking victims are more susceptible to being trafficked again, by either the same person or another trafficker. The Markov Chain we developed models the movement from trafficking (or sex trading) to states of increased susceptibility due to experience of trafficking. These findings flag a glaring gap in our prevention and intervention efforts. People removed from trafficking are in many ways even more vulnerable to re-trafficking because our systems do not provide appropriate types or amounts of necessary supports. Prior experience of trafficking makes it easier to go back when times are tough. These same patterns are evident within the broader category of sex trading, which includes trafficking, but also other forms of commercial sex. This study addresses a serious gap in knowledge, because very little is known about re-victimization or re-recruitment (Kafafian et al., 2021).

Using a transdisciplinary approach, we were able to create a computational model of the transition probabilities for pathways into and out of trafficking (or sex trading) linked to conditions that structure different levels of susceptibility (low, medium, and high). The conditions we modeled were housing, substance use and mental health, within the population

context of youth in the child welfare system. The model also contains what are called “absorbing states” that model “what gets you out” of the susceptibility cycle. This explores transitions to many different life outcomes, including a more stable life, unstable but no longer at risk of trafficking, long-term incarceration, and passing away. The full model, with calculated probabilities of getting out of the susceptibility cycle to each of these life outcomes is displayed in Figure 7 in the Results section. A strength of our study is that these same themes emerged independently from the qualitative data depicted in Figure 5 that presents a conceptual model of the whole process of recruitment into and out of a trafficking operation.

Using the Markov Chain model, we were able to show quantitatively that housing could be an *effective intervention opportunity* to disrupt, not simply displace recruitment networks. Taken together with the qualitative research, this finding makes sense. The qualitative research documented that recruitment networks and tactics often rely on instability or lack of basic needs. Provision of housing could undermine the context in which recruitment relationship networks flourish. Thus, destabilizing recruitment mechanisms and reasons for re-trafficking. Provision of housing is one important piece that may block what “gets you in” and “what gets you back in.” The computational data behind the Markov Chain model is preliminary, but the model itself shows promise for guiding decision-making.

Finally, our project’s focus on reflection, team building, and trust as well as co-creation with lived experience experts surfaced potential *unintended consequences* and *ethical challenges*. There are inherent difficulties modeling something that is complex and variable, especially because in the problem space of trafficking there is incomplete data. We identified numerous problems related to incomplete data that plagues research in this field. Further, there are challenges in abstraction. Difficulties emerged due to lack of generalizable data and to difficulties and pain involved in abstracting from violence and harm. Our project addressed the data limitations by focusing on the specific population of youth in the child welfare system for our computational work. The specific focus our modeling means that our findings are not immediately generalizable to all involvement in sex trading including trafficking. This raises ethical considerations related to application of our results. Because of our focus, results likely will not apply to all people involved in commercial sex. We addressed issues related to abstraction by creating intentional and supportive processes. To promote equity in outcomes, we must take care to identify potential negative consequences for other populations. We identified the need for processes that support the inclusion of lived experience and wisdom garnered through pain. We also noted a number of challenges related to the potential use of our data. Specifically, our work highlights the shortcomings of arrest and “rescue” as disruptions of recruitment networks. Findings point to the need for deeper structural interventions to reduce susceptibility.

Limitations

Like all research, this study has many limitations that we discussed throughout the report. A primary limitation is a lack of longitudinal and representative data needed to scope and populate the Markov Chain model. To address this, we narrowed the focus of our work to a specific population, youth in child welfare, for which there is comparatively more data. Even with a focal population that is more specific, we were not able to identify longitudinal data on our specific population. We developed reasonable procedures to approximate realistic data. Markov Chain transition probabilities are speculative. The goal was to see if we could model the

elements within the Markov Chain, not necessarily to create final versions. However, this is a limitation.

A person's life experience and history affect their future circumstances. When developing quantitative models like the Markov Chain, some assumptions are needed to determine how much "memory" the model should incorporate from a person's prior experiences. We chose to build memory into the model to indicate whether a person has ever previously been trafficked (in the simple model) or traded sex (in the larger model). Incorporating more details of a person's life history provides additional nuance into the model, but requires substantially more, and more detailed, data to populate the model. As aforementioned, data limitations currently preclude populating models with more detailed memory.

Our selection of youth as a focal population for the Markov Chain model means that findings may or may not be applicable to adults. This also muddied the conceptual waters between sex trafficking and sex trading since the data we identified did not differentiate instances of third-party trafficking experiences. Our qualitative research is applicable to both youth and adults and it was narrowly focused on the behaviors of traffickers and socio-cultural and structural contexts in which they recruit victims. Unfortunately, there is not total alignment between the framing of the qualitative research (i.e., sex trafficking) and the computational modeling (i.e., sex trading). We must appropriately scope and delineate assumptions in order for computational models to be accurate and useful. These models never capture all possible experiences or the fullness of the experience. This is a limitation.

In our qualitative data collection, we were not able to reach saturation among a number of key populations. Thus, our findings are less widely applicable than we would have liked. Another limitation is that both the qualitative data and the data underlying the computational model are specific to the State of Minnesota. Key informant interviewees shared what they know about recruitment in the context of Minnesota. This was appropriate since the approach was new and exploratory. We believe the conceptual models developed here are broadly applicable to other similar contexts; however, additional data collection is needed to verify findings for other populations or locations.

We were not able to interview traffickers directly to learn from them about recruitment tactics and strategies. This is an important perspective that is missing from this study. Further, this study did not gather information about how sex buyers may act as recruiters. This is a gap in our findings that requires more investigation.

Implications for Practice

Our transdisciplinary team has identified several implications for practice. The purpose of our study was to understand recruitment in sex trafficking in order to identify ways to disrupt it and prevent trafficking. However, our findings suggest that to disrupt recruitment we may need to address systemic problems (e.g. housing and poverty) and complex human needs for belonging and recognition. Further, our findings highlight how the current delivery of services and supports is not adequate to prevent initial recruitment and may be a factor in re-recruitment. Anti-trafficking work could focus on tackling these issues.

The survivor-centered advisory group surfaced implications for practice. First, they suggested that the conceptual and computational models could illuminate the complexity of the issues and the factors that facilitate initial trafficking and re-trafficking. Specifically, we could develop the models into trainings for people working in the field such as social workers, case managers, mental health practitioners, prosecutors, and law enforcement. This could help them

understand the long and cyclical nature of trafficking and re-trafficking. One advisory group member said:

“[T]raining, maybe make meaning of some of these complexities when you are not really evident how not only complex but you could really map out empirical data that people are not wanting to figure but when you put in mathematical figures people have.”

Similarly, the advisory group suggested that findings from this report show that no one single intervention will disrupt sex trafficking and sex trading. They advocated for longer-term multi-sectoral and multi-faceted approaches, stating, “a three-month program is not going to do the trick.” They thought that these findings should spur funding streams to prevention of sex trafficking. Prevention strategies would need to have a greater emphasis on the socio-structural elements that initially push people into trafficking and, if unmet, are strong indicators for individuals re-engaging in trafficking.

Second, the survivor-centered advisory group saw practical application of the Markov Chain model that could assist victims and survivors to reflect on, contextualize, and make meaning of their own experiences. They highlighted that seeing the pathways and experiences in the model could be a tool for helping reduce shame and stigma; fostering self-acceptance about how long and hard the path to healing really is. Both the conceptual and computational model can reinforce that victimization is not the fault of the victims, but rather it is due to the system, structures, laws, policies, and lack of safety nets that allow trafficking to happen.

One member suggested we could create the following:

“[a] modified version [of the Markov Chain model] for them [victims/survivors]. It could be an excellent activity or tool [to show] if this is where you are this is where you could be. This is a research project; this is factually based information from existing information who have come out of this life so when we talk about taking off glamour if you choose to tell them where you are these are things that are going to take place it is where everyone ends up to some degree.”

Members talked about seeing their own complex pathway in the Markov Chain and that the experience was healing and validating. As one member described how the model is accurate.

“Factual from the horse’s mouth, from people who get this really. [It] helped me see on a mental health level of why my thought process is the way it is. The model, and circles, and arrows and they were going all over. That is how my mind flows and frequent flip back and forth in our minds in the capacity the confusion the back and forth, double dipping, showed a visual of my brain cells firing.”

Finally, our report has implications for criminal justice practice. Of course, law enforcement and courts systems have a responsibility to prosecute offenders and help victims of crime. Our data suggest that these efforts may not be as useful in preventing recruitment or re-recruitment into trafficking as is generally thought. In fact, some aspects of the criminal justice system may contribute to re-trafficking. For example, when a person is pulled out of a trafficking situation by law enforcement there are limited services and supports available. Our findings suggest that if a victim does not have adequate access to basic needs after leaving a trafficking

situation, they are susceptible to re-recruitment. Arrest of trafficking victims makes it all the more difficult for them to qualify for services such as housing. Laws in Minnesota prohibit the arrest of a juvenile for prostitution offenses and law enforcement practice in Minnesota is shifting away from arresting adults for trading or selling sex. Yet, law enforcement does arrest people who trade sex for other criminal activities, such as loitering or drug charges. A criminal record could make someone more susceptible to sex trafficking because of all the collateral consequences.

Implications for Research

Our findings highlight a myriad of implications for future research, all stemming from the need for more and better research data about recruitment into sex trafficking and longitudinal or life course experiences of people involved in transactional sex, but also those who are or were susceptible to involvement. In particular, we need this underlying content data to support additional computational modeling. Accurate enumeration of transition probabilities requires details about sequencing and life course trajectories of numerous individuals. Such data would need to include people who were susceptible to recruitment, but not ultimately recruited in order to understand transition probabilities since not all people who are susceptible will actually be recruited. This data does not exist. We recommend more studies that focus on life course trajectories of people who may be at-risk of involvement in sex trafficking or sex trading, depending on the model focus. However, this is very difficult data to collect and it comes with the very real possibility of re-traumatization of potential research participants. Any work in this area would need to proceed thoughtfully and in partnership with lived experience experts. A qualitative retrospective life history approach is a promising potential.

The systematic review identified a lack of studies specifically on the recruitment phase of sex trafficking. This is an area for future research. Likewise, we need more research on how the different types of experiences in human trafficking for sexual exploitation relate to one another. Conflation of experience and inconsistent use of terms across the field contributes to a lack of specificity and transferability of extant data for modeling purposes. The lines between trafficking, exploitation, and engagement in sex trading for other reasons are not clear. Past research suggests that involvement in sex trading without a third party and knowing people involved in sex trading puts people at greater risk of third-party trafficking. Our study was not able to include this in the model, and this would be an important direction for future research.

There is need for more research on recruitment from those who do the recruiting, including traffickers, “bottoms” or “top girls,” peers, and others. This is a weakness within the field pertaining to almost every aspect of human trafficking (Barrick et al., 2023).

The work presented here provides a successful case study of integrating the lived experience of a survivor-centered advisory group into both qualitative research and the computational modeling process. In our working paper, Sharkey et al. (2024), we carefully demonstrate how much stronger and grounded the models became through our team’s community-based, action research approach that puts lived experience at the forefront of the modeling and data collection. This research framework is particularly important since, as noted by survivor Sabra Boyd in a critique of Amazon’s Tech against Trafficking summit (Boyd, 2022), “tools created with trafficking survivors are exponentially smarter and more effective than without us.” Further, Deeb-Swihart et al. (2022) list participatory design for artificial intelligence against human trafficking as an important new area of work. To the best of our knowledge, we are one of the first teams to apply such a survivor-centered framework within the artificial

intelligence and computational modeling area. The framework should help other researchers in this area to ensure models are created and data is gathered in a way that incorporates the lived experience and carefully discusses the limitations of the models and analysis. An important area of future work is to continue to improve upon this research framework.

Report Conclusion

Through a mixed methods research approach that incorporated qualitative and computational modeling and centered lived-expertise from a survivor-centered advisory group, our study uncovered insights into the structure and function of sex trafficking recruitment. Our qualitative findings show that recruitment networks are structured by relationships and identified how, why, and when at least seven recruitment mechanisms (coercion and force, fraud, belonging, seduction, basic needs, glamorization, and normalization) are used and function. In addition to these descriptive and conceptual insights, we developed a computational mathematical model called a Markov Chain that models how a person's susceptibility to being recruited and re-recruited into trafficking is affected by their ability to access services and supports. This model serves two purposes. First, it visualizes the complex recruitment and re-recruitment pathways that victims of trafficking experience from a systemic view of susceptibility. Second, the model can test the potential effectiveness of proposed interventions to prevent recruitment and re-recruitment. The Markov Chain could be used both to explore the effectiveness of current interventions and prospective interventions prior to implementation. Both of these applications have potential to improve anti-trafficking and trafficking recruitment prevention approaches in practice. Our results illuminate recruitment pathways and can be used to guide public investment and policy toward interventions with promise for preventing recruitment and promoting resilience against recruitment.

Appendix 1: References

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Appendix 2: Products and Publications from the Grant

Peer-Reviewed Publications

Martin, L., Matthias, C., Abeyta, S., Kafafian, M., Barrick, K., & Farrell, A. (2023) Mechanisms of recruitment into sex trafficking operations: A systematic review to support prevention. *Global Crime*, 1-24.

Barrick, K., Farrell, A., Mattias, C., Williams, M., & Martin, L., (working paper). Assessing the use of law enforcement and prosecutorial case files to understand sex trafficking: Caveats and considerations.

Martin, L., Matthias, C., Williams, M, Barrick, K., (Working paper). Recruitment is a process: Context, vulnerability, and recruitment tactics used in human trafficking for sexual exploitation.

Tezcan, B., Maass, K. L., Sharkey, T., Barrick, K., Forliti, T., Mariotti, M., Friedman, J., Ayler, T., Nelson, C. & Martin, L. (working paper). Modeling Youth's Susceptibility to Trading Sex Using Markov Chains.

Maass, K.L., Sharkey, T., Song, Y., Tezcan, B., Kosmas, D., Bruno-Lopez, D., Barrick, K., & Martin, L. (working paper). Adaptions to network interdiction models to aid in anti-human trafficking decision making.

Sharkey, T. C., Ayler, T., Barrick, K., Forliti, T., Friedman, J., Maass, K., Nelson, C., Mariotti, M., Tezcan, B., & Martin, L. (working paper). "It depends:" The necessity of transdisciplinary research and lived experience for co-creating quantitative models to disrupt sex trafficking. Abstract submitted as a 'Presubmission for a Perspective' to *Proceedings of the National Academy of Sciences*

Video and Multimedia Products

Maass, K. L., Tezcan, B., Hodsdon, M., Zhang, M., Cheung, R., Farrell, A., Sharkey, T., Song, Y., Barrick, K., Matthias, C., Williams, M., Brown, C., Florey, M. Ayler, T., Friedman, J., Nelson, C., Forliti, T., Mariotti, M. & Martin, L. (2023). "Disrupting Sex Trading Recruitment Using Community Based-Resources." (2023) <https://tinyurl.com/Community-Based-Interventions>

Tezcan, B., Maass, K. L., Zhang, M., Hodsdon, M., Cheung, R., Farrell, A., Sharkey, T., Song, Y., Barrick, K., & Martin, L. (2023) "Disrupting Sex Trading Recruitment Using Community Based-Resources – PSOR Video Competition," Institute for Operations Research and the Management Sciences Section on Public Sector Operations Research. 2023 PSOR Video Competition. <https://youtu.be/dqchlmvSO20>

Presentations

"Disrupting Human Trafficking Recruitment Using Community-Based Resource Allocation Models" Tezcan, B. (Presenter), Maass, K. L., Sharkey, T., Song, Y., Martin, L., Barrick, K., Farrell, A., INFORMS Annual Meeting, Phoenix, AZ. Oct. 2023.

“From Insights to Action: How Industrial Engineering Can Aid Anti-Human Trafficking Efforts”
Maass, K.L. (Presenter), Rutgers University, Industrial and Systems Engineering Dept.,
Piscataway, NJ, Nov. 2022

“Broadening our Perspective of Disruptions” Maass, K.L. (Presenter), Massachusetts Institute
of Technology, Cambridge, MA, May 2022.

“From Insights to Action: How Industrial Engineering Can Aid Anti-Human Trafficking Efforts”
Maass, K.L. (Presenter), Northeastern University, Impacting Science Seminar, Boston, MA.,
Mar. 2022

“Disrupting Sex Trafficking Recruitment Using Community Based Resource Allocation Models”
Tezcan, B. (Presenter), Maass, K. L., Sharkey, T., Song, Y., Martin, L., Barrick, K., Farrell, A.,
INFORMS Annual Meeting, Indianapolis, IN. Oct. 2022.

“Disrupting Sex Trafficking Recruitment using Community Based Resource Allocation Models”
Tezcan, B. (Presenter), Maass, K. L., Sharkey, T., Song, Y., Martin, L., Farrell, A., Barrick, K.
IISE Annual Conference, Seattle, WA. May 2022.

*“Disrupting Human Trafficking Operations and Recruitment through Community-Based
(Operations) Research.”* Sharkey, T. (Presenter), Maass, K. L., Martin, L., Barrick, K. Furman
University, Department of Mathematics/Business and Accounting. Greenville, SC. Dec. 2021.

Applications for Future Funding

“Preventing Human Trafficking: Using State-Transition Models to Effectively Allocate
Community Resources”. NIJ Graduate Fellowship 2023 application by Baris Tezcan, O-NIJ-
2023-171521, Current Status: Under Review.

Appendix 3: Key Project Personnel

First	Last	Affiliation
PIs/Faculty		
Lauren	Martin	University of Minnesota
Tom	Sharkey	Clemson University
Kayse	Maass	Northeastern University
Kelle	Barrick	RTI, International
Amy	Farrell	Northeastern University
Research Staff/Graduate Students		
Cynthia	Matthias	University of Minnesota
Martha	Williams	University of Minnesota
Christina	Melander	University of Minnesota
Emily	Singerhouse	University of Minnesota
Barış	Tezcan	Northeastern University
Mahima	Gupta	Syracuse University
Matthew	Kafafian	Northeastern University
Stephen	Abeyta	Northeastern University
Undergraduate Students		
Melissa	Florey	University of Minnesota
Advisory Group		
Teresa	Forliti	Independent Consultant
Tonique	Ayler	Independent Consultant
Joy	Friedman	Independent Consultant
Christine	Nelson	Independent Consultant
Michelle (Mikki)	Mariotti	The Family Partnership

Appendix 4: Semi-Structured Interview Consent Form and Interview Guide

Consent Form

Modeling Effective Network Disruption of Recruitment (MEND-R) Information Sheet and Consent Form February 2021

You are invited to be in a research study to identify unique aspects of recruitment of victims into trafficking networks to inform mathematical models that can support effective decisions to disrupt these networks. These models will allow us to visualize and explore possible interventions into trafficking networks in ways that may reduce harm and improve effectiveness. You were selected as a possible participant because you are a knowledgeable stakeholder. This study engages expertise and consultation from a wide range of perspectives, including social science researchers, operations researchers, sex trafficking survivors, advocates, law enforcement personnel, past research, and law enforcement case files.

This study is being conducted by Lauren Martin, associate professor, University of Minnesota School of Nursing, Population Health and Systems Cooperative Unit.

Specifically, we are looking to understand generic and abstracted structures, functions, and processes of how trafficking operations recruit victims. This project is a research partnership between the University of Minnesota, Clemson University, Research Triangle Institute, Northeastern University. The project is funded by the National Institute of Justice (Grant #: 2020-MU-MU-0040).

What you can expect in an interview

We are talking to you today as an expert knowledgeable about sex trafficking operations. Expertise comes in many forms including lived experience and survivorship, investigating trafficking operations and identifying victims, prosecuting cases, providing social services for victim/survivors, and more. As an expert, we will not ask you to share personal details about your life and we will not collect personal identifying information. Rather, we are interested in learning from you about trends and patterns of sex trafficking operations.

This interview will take about 60-90 minutes. The interview is semi-structured and we will ask questions based on your specific expertise. Question topics will focus on the structures of recruitment in sex trafficking operations (including the players involved and their roles). We will also ask for your thoughts on the dynamics that you think might change the network as well as the potential impacts of disruptions, interdictions or interventions. We will also ask for your best estimation of the numbers of people involved in different networks and descriptions of the different roles. Finally, we ask you to explore ethics and unintended consequences. We may contact you for follow-up and clarification after the interview. This is not a requirement.

How we will store your data

We will ask for your permission to do an audio recording of this interview for accuracy. All interview notes and audio files are saved on a secure cloud-based storage only accessible to the research team. All interview notes and audio files will be de-identified, meaning we will remove any names or locations you might accidentally mention. Audio files will be deleted once this

project is complete. De-identified and Anonymized interview data will be archived with the National Archive of Criminal Justice Data, per funder requirements.

Confidential and voluntary

Your participation in this interview is confidential and voluntary. We will not collect any identifying information about you or share any quotes that could reveal your identity. You can choose to skip any question you do not want to answer. You can choose to stop participating in this interview at any time without any consequences to you. We will remove any portion of the interview transcript that might make it identifiable to you prior to archiving. You can review your transcript so that you are satisfied that we have removed identifiable information.

Risks

There are minimal risks to participating in this interview. These include potential emotional discomfort from discussing sex trafficking operations. We plan to mitigate these risks by strongly encouraging you to only share what you are comfortable sharing, to not ask you to share or recount graphic experiences, and to stop or pause if you are uncomfortable.

Values

Our team believes that research should do no harm and be trauma responsive. Trauma can take many forms, impacting individuals, families and communities and can be intergenerational. We have developed our research protocols to be sensitive to the impacts of trauma. This means you have choice over what you share and when to stop. We strive to create a comfortable setting for all our interview participants. Our research team has extensive experience working with people who have experienced complex trauma and who have been impacted by the commercial sex industry. We would appreciate your feedback about how this interview went.

Benefits

There are no direct benefits to you from this study.

Compensation

Participants who have lived experience in sex trafficking will be compensated \$75.

Contact Information

If you have questions or concerns about this study, contact the project's Primary Investigator Lauren Martin via email at mart2114@umn.edu or phone (612)-624-4035.

Consent

- Yes I consent to participate
- Yes I consent to audio recording

You will be given a copy of this information for your records if you want it.

Semi-structured Interview Guide

Note: This helped to guide the interview. The interviewer followed the lead of the interviewee. We did not read the domains, questions and prompts verbatim. These were used a guide. The interview protocol required explanation before and during to help interviewees focus on abstract networks and processes rather.

Before starting the interview, the interviewer will do the following: (1) **Ask if this is still a good time to talk.** (2) Confirm consent to participate and record – highlight **voluntary and the archiving.** (3) Emphasize that we are looking for information on general patterns, trends, and structures across trafficking operations; a birds-eye view of how this works. (4) Not asking for specific (i.e. named) individuals or details of the interviewee’s personal experiences. Identifiable information will be redacted. (5) Focus is to understand the role of **third-party traffickers.**

Introduction	
<p>OPENING Q: How do you know about trafficking?</p>	<p>PROMPTS: Survivor, investigator, prosecutor, social worker, etc.</p>
<p>STARTER: We are focusing specifically on third-parties and their role in recruitment. Based on your knowledge and experience, what type of experiences of sexual exploitation and trafficking situations are you most familiar with?</p>	<p>PROMPTS: <i>Networks:</i> single pimp, pimp networks, corporate-style; street-based, online escorts, brothel or massage parlor, etc. <i>Neighborhood or Communities:</i> low income, POC, reservations, rural, areas with abandoned houses, etc. <i>Venues:</i> street-based, high-end parties, brothels, online, escort, etc.</p>
Recruitment process and how traffickers tailor recruitment technique	
<p>How do trafficking operations recruit or “get” a person as a victim? (or involved in a trafficking or sexual exploitation situation?)</p>	<p><i>Open-ended, Start from here and build in questions where it makes sense.</i> PROMPTS: What do [recruiters] do or say? How do they make a victim feel? Is it someone they know (family member, friend, acquaintance, boyfriend)?</p>
<p>Who is involved in recruitment? What are their roles? What do you call the different people involved (i.e. trafficker, associates, drivers, etc.)</p> <p><u>NOT asking for people’s names</u></p> <p>If drawing, use to structure questions. Ask if we can keep it.</p>	<p>PROMPTS: <u>In person/TRY on zoom:</u> Can you (or I) draw a “typical” recruitment network? [<i>Use discussion of context from above to shape “typical” in a specific context</i>]</p> <p>Ask them to describe the different people their connections to each other [Trafficker, associates, drivers, “bottom” or “top girl”, people selling sex, peers, family members, people buying sex, others].</p> <p style="padding-left: 40px;">Who makes the decisions? Tell me more about how this person recruited/trafficked/gets someone involved?</p>

What kinds of things do traffickers [and others] do or say to rope people into the life?	Force (told you had no choice), fraud (tricking someone, giving someone false hope), coercion (pressuring you, threats of violence)? Strategies? Techniques?
What needs or vulnerabilities would someone try to meet through being in the life?	What does that look like? Who does what?
From your knowledge, do recruitment techniques look different over time or with different people?	<i>Variations in techniques for recruitment or “roping people in”</i> : Neighborhoods? Different victim characteristic (race, age, gender, etc.)? Location (school, park, party, etc.)? What comes first and then next?
Is there a difference in recruitment techniques for somebody who has already been in the life or not?	How is it different? Different people involved? Different approach? Harder? Easier?
<i>Leaving a trafficking network</i>	
How or in what ways does a person get out of a trafficking situation or sexual exploitation?	What are the routes? Police rescue? Social support services (housing, treatment, etc.)? Family? Trade up? Renegade? Well paying, legitimate job? Injury/illness? Arrest/jail?
After leaving trafficking, is a person still vulnerable to being trafficked again?	What factors might make them less vulnerable to re-recruitment? What does it look like for a victim/survivor to leave the context of trafficking completely?
What kind of support could assist a victim in leaving trafficking?	What types? Who would be best to help and assist? Welfare checks, arrest/citation (prostitution, other crime, traffic stop), health care, social work, housing, child protection, mental health, church/spirituality, family
<i>Prevention or Changing Susceptibility to Trafficking</i>	
What kinds of things make someone more vulnerable?	Poverty, drug use, age, prior experience of violence, what else? Basic needs?
What kinds of things make someone less vulnerable?	AFFORDABLE housing, healthy love, community support, livable wage, education
How can we prevent recruitment from happening?	What kinds of things might block a trafficker from being successful at recruiting a victim?
<i>Other network related questions, SKIP IF SHORT ON TIME</i>	
Network changes over time	What factors influence when/if a trafficking operation will recruit, promote, or “hire” others into the network? What happens to the network if a victim leaves?
Disruptions	How do recruiters change or adapt their tactics based on different interventions?
<i>Closing and Thank You</i>	
Grand Tour	Is there anything else you think we need to know about recruitment networks, strategies and tactics?

	Circle back to any loose ends from the interview
Anyone else we should talk with?	MAKE SURE TO ASK THIS! Get name and contact OR ask them to reach out first.
THANK YOU	Review the project next steps: Talk about the confidentiality protocols, Ask if we can keep their drawing, Ask if we can follow-up if we need clarification, Ask if they want to read their transcript for accuracy, If a survivor, do the gift card.

Appendix 5: Math Formulas for the Markov Chain Model

In this appendix, we provide how absorption probabilities and first-passage probabilities can be calculated. We refer the reader to Pinsky and Karlin (2010) for a more detailed discussion.

Let's say we have $r + 1$ states in our Markov Chain and we label each of them from 0 to r without loss of generality. We can also define the transition probability matrix with P where each element p_{ij} denotes the probability of moving from state i to state j for $0 \leq i, j \leq r$. We also call a state *absorbing* if the probability of going to any other state but itself is zero. In other words, if state i is absorbing, we would have $p_{ii} = 1$ and $p_{ij} = 0, \forall j \neq i, 0 \leq j \leq r$. If a state has a series of transitions with positive probabilities that lead to an absorbing state, we refer to this state as *transient*. Transient states have the property that, in the long-run, they will eventually not be visited again since the Markov Chain will transition into an absorbing state.

In our context, if we are currently in a transient state, we are interested in the following questions:

- What is the probability of starting in this particular transient state and reaching a specific absorbing state? We refer to this as the *absorbance probability*.
- What is the probability of starting in this particular transient state and reaching a specific transient state? We refer to this as the *hitting probability*.

These are common analysis that are done with Markov Chains, and we describe them below.

Absorbance Probability

We will denote u_{ik} as the probability of starting in a transient state i and ever visiting (or ending up at) absorbing state k . Note that this definition is different than p_{ik} as we are looking for ever visiting the absorbing state, not the immediate transition from state i to state k . This probability can be found by solving simultaneously for all transient states using the following set of equations:

$$u_{ik} = p_{ik} + \sum_{j: j \neq i, 0 \leq j \leq r} p_{ij} u_{jk} \text{ for } i = 0, \dots, r$$

Hitting Probability

We will denote h_{ia} as the probability of starting from state i and ever visiting (non-absorbing) state a . The approach to calculating these probabilities is quite similar to the absorbance probability calculations, with an important simplification. In particular, if we are examining a non-absorbing state a , then we have that $h_{aa} = 1$, as we are already in the 'target' state. We then can use this in order to solve the following set of equations to determine h_{ia} for all states i simultaneously:

$$h_{ia} = \sum_{j=0}^r p_{ij} h_{ja}, \forall i \neq a$$

$$h_{aa} = 1$$

For both cases, we need to solve a system of linear equations. Pinsky and Karlin (2010) provide conditions for the existence of such solutions; we note that the constructed Markov Chains in our research all satisfy the required conditions.

Appendix 6: Data Tables from the Minnesota Student Survey Qualitative Analysis

MEND-R Logistic regressions (N=1,940)

	Trading sex as Outcome OR (95% CI)	Trading sex as Predictor OR (95% CI)
Social Factors		
Shelter	5.571 (3.905-7.947)	5.565 (3.901-7.939)
Food insecurity	3.245 (2.244-4.692)	3.249 (2.247-4.697)
Mental Health		
Depression or anxiety	2.047 (1.436-2.918)	2.023 (1.422-2.878)
Lifetime suicidality	5.141 (3.350-7.888)	5.029 (3.283-7.702)
Substance Use		
Alcohol use	7.529 (5.182-10.939)	7.528 (5.182-10.938)
Cannabis use	7.097 (4.921-10.234)	7.096 (4.920-10.233)
Prescription misuse	10.401 (7.196-15.034)	10.399 (7.194-15.031)
Other drug use	8.859 (6.153-12.755)	8.847 (6.146-12.735)
Violence		
Sexual violence	11.292 (7.397-17.238)	11.005 (7.226-16.759)
Abuse at home	3.861 (2.678-5.565)	3.849 (2.671-5.546)
Sexual behavior		
Had sex	6.500 (4.241-9.963)	6.490 (4.235-9.945)
Protective Factors		
Community caring (binary)	Not significant	Not significant
Community caring (scale)	--	0.715 (0.619-0.824)
Feel safe at school (binary)	0.296 (0.203-0.431)	0.295 (0.202-0.430)
Feel safe at school (scale)	--	0.519 (0.420-0.642)

Note:
 All OR are significant at $p < .001$ unless otherwise noted
 OR, odds ratios; CI, confidence interval; TGDQ, transgender, gender diverse, or questioning gender identities
 Analytic sample are 9th and 11th grade students who have ever been involved in foster care. All models control for gender modality/identity and race. Analytic n for each model will be affected by listwise deletion (missing data) from each factor (missing data for gender modality/identity and race/ethnicity are excluded from the presented N).
 Dr. Camille Brown conducted this analysis in collaboration with the transdisciplinary team.

Appendix 7: Vignettes for Markov Chain Data Elicitation (Susceptibilities)

Vignette 1:

Juanita and Maria are teenage sisters living in foster care together. Juanita has been withdrawn and has been feeling like she doesn't fit in with anyone at home or school. Maria has recently started using drugs.

Questions:

- Who do you think is more vulnerable to commercial sexual exploitation?
- How vulnerable is Maria to being recruited by a trafficker?

Vignette 2:

Noel and Erika are 15 years old and living in foster care. They have similar life circumstances, except for their mental health. Noel has the typical teenage ups and downs in mood and is confident in herself. Erika has been diagnosed with anxiety and isn't taking her prescribed medications. She often has trouble making decisions and is socially withdrawn. She hasn't been doing well in school lately.

Questions:

- How much more vulnerable to commercial sexual exploitation is Erika compared to Noel?
- How vulnerable is Erika to being recruited by a trafficker?

Vignette 3:

Kia is a 16 year old who is highly dependent on drugs and in a severe mental health crisis. Some nights she couch surfs and other night she sleeps on the streets.

Questions:

- How vulnerable is Kia to being recruited by a trafficker?
- How vulnerable is Kia to commercial sexual exploitation?

Vignette 4:

Laticia and Aamanya are both 15 years old and they live in the same neighborhood within similar families. The main difference between Laticia and Aamanya is that:

- Laticia has a close friend involved in commercial sex (this friend is not Laticia's relative).
- Aamanya has a sister involved in commercial sex.

Questions:

- Who do you think is more vulnerable to commercial sexual exploitation?

Vignette 5:

Chelsea and Thea are 16 year old classmates with similar economic backgrounds from the same neighborhood. Chelsea recently started having problems with housing due to problems with her family but doesn't drink or use drugs. Thea lives with her family but recently started using drugs and alcohol to get through the day.

Questions:

- Who do you think is more vulnerable to commercial sexual exploitation?

Vignette 6:

Nika is a teenager who was sexually exploited by her boyfriend. She is no longer in the exploitative relationship, but now finds herself struggling with the same housing, mental health, and substance use issues as she was before the exploitation.

Dorothy is a teenager who has never been sexually exploited. She is struggling with housing, mental health, and substance use issues.

Questions:

- How much more vulnerable to commercial sexual exploitation is Nika compared to Dorothy?
- How vulnerable is Nika to being recruited by a trafficker?

Appendix 8: Vignettes for Markov Chain Data Elicitation (Transition Probabilities)

Vignette 1:

Aurora is 16 years old and is in foster care with a stable and supportive housing situation. However, Aurora uses drugs and alcohol frequently and has anxiety and depression. She has not previously traded sex. Which of the following below do you think are the most likely to happen next to her?

You can drag the options below to place them in order. Let 1 be the thing you think is MOST likely to happen to her NEXT and 6 be the thing that is LEAST likely to happen to her NEXT.

Response Options:

- She starts trading sex
- She goes to an institution, such as a juvenile center or a rehab facility
- She addresses either (or both) of her mental health and substance use problems, making her less vulnerable
- She becomes more vulnerable (perhaps because she loses her stable housing)
- She stays in the same situation (nothing changes from the prompt)
- She passes away

Vignette 2:

Consider 100 youth who are currently trading sex. We only know that they are in the foster care system, but we do not know anything else about their past vulnerabilities or stories. What would be your best guess on what would happen next for these 100 youth? Please select the number of youth you think will experience the events below next.

Example: If you select 30 for 'Going to an institution', it means that you expect about 30 of the youth trading sex right now will go directly to an institution from trading sex.

The total number must equal 100.

Response Options:

- Institutions
- Having no housing, mental health, or substance use concerns
- Having no housing concerns, but having difficulties with mental health and substance use
- Having difficulties with housing, mental health, and substance use
- Passing away

Vignette 3:

Cyan and Randy are both foster care youth and 17 years old. They are both currently at an institution (such as Rehab, Jail, etc.). Unfortunately, we do not know more about their histories and the vulnerabilities they have had in the past. We only know that Randy has traded sex before.

Now they are about to leave the institution that they are in. What are your best guesses for what would immediately happen next for them?

Response Options:

For each response option listed below, the respondents were prompted to choose either “More likely for Cyan,” “Equally likely for both,” or “More likely for Randy”.

- Trading sex
- Passing away
- Having no major vulnerabilities in terms of housing, mental health, and substance use
- Having some vulnerability including mental health and substance use problems
- Having a lot vulnerabilities including housing, mental health and substance use problems
- Having practically no vulnerabilities; having an extremely low chance of trading sex in the future