

Learning Each Other's Language and Building Trust: Community-Engaged Transdisciplinary Team Building for Research on Human Trafficking Operations and Disruption

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Abstract

Background: Human trafficking for sexual exploitation (referred to as sex trafficking) is a complex global challenge that causes harm and violates human rights. Most research has focused on victim-level harms and experiences, with limited understanding of the networks and business functions of trafficking operations. Empirical evidence is lacking on how to disrupt trafficking operations because it is difficult to study; it is hidden and dangerous, spans academic disciplinary boundaries, and necessitates ways of knowing that include lived experience. Collaborative approaches are needed, but there is limited research on methods to best build transdisciplinary teams. **Aim:** The aim of this study was to understand how to form a community-engaged transdisciplinary research team that combines qualitative and operations research with a survivor-centered advisory group. **Methods:** We conducted a qualitative meta-study of our team that is seeking to mathematically model sex trafficking operations. Data were collected from the minutes of 16 team meetings and a survey of 13 team members. **Results:** Analysis of meeting minutes surfaced four themes related to content and style of communication, one related to value statements, and one capturing intentional team building efforts. Survey results highlighted respect, trust, integrity, openness and asking and answering questions as key aspects of team building. Results show that an action research approach to team building, focused on trust and communication, fostered effective collaboration among social scientists, operations researchers, and survivors of trafficking. **Conclusion:** Team building, shared language, and trust are essential, yet often neglected, elements of team science. This meta-

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study provides important methodological insights on community engaged transdisciplinary team formation to tackle vexing social challenges.

Keywords

human trafficking, sex trafficking, transdisciplinary, team science, public engagement, communication, trust

Grand challenges—such as human trafficking—span academic disciplines and necessitate team science. Although much lauded, combining radically different methods, knowledge bases and experiences into a functional team that can carry out complex research is challenging. We use the framework of transdisciplinarity, defined by Lotrecchiano and Misra (2018) as “knowledge production through integration and collaboration in the pursuit of addressing complex societal problems” (p. 42). *Integration* across disciplines requires communication (and listening), trust-building, willingness to learn new perspectives, and time (Nancarrow et al., 2013; Cartmill et al., 2011; Cannon-Bowers & Salas, 2001).

Transdisciplinary research that seeks real-world impact also requires collaboration *with* communities outside the academy (Sandwick et al., 2018; Martin et al., 2016; Wallerstein et al., 2020). Community-engaged research happens when universities and academic researchers partner with people, organizations, and entities outside the academy who do not typically conduct research (Beaulieu, 2018; Furco, 2010). Inclusion of community partners can invigorate and democratize academic research so that it remains relevant and vital for the public good (Holland & Malone, 2019; Levin & Greenwood, 2017; Tebes & Thai, 2018; Ferris et al., 2021). However, issues of trust, respect, power, and communication pose challenges to transdisciplinary and community-engaged research (Heinzmann et al., 2019; Monteiro & Keating, 2009; Wallerstein et al., 2019).

This paper describes findings from a qualitative meta-study of a community-engaged transdisciplinary research team on a project called “Modeling Operations of Sex Trafficking” (MOST). MOST was a collaboration of qualitative researchers, operations researchers (a field housed in applied mathematics or systems and industrial engineering), and a sex trafficking survivor-centered advisory group. The team worked together to develop a new conceptualization of networks that traffic people for sexual exploitation (referred to here as sex trafficking) as business operations that can be mathematically modeled. These models could then be leveraged to aid decision-making in the field by identifying opportunities for disrupting trafficking operations.

Sex trafficking falls under the larger umbrella of human trafficking, which is defined as the use of force, fraud or coercion to compel a commercial sex act or other forms of labor. There is limited empirical evidence on how sex trafficking operations are structured, how they work in practice, and how to disrupt them (Farrell & de Vries, 2019; Konrad et al., 2017; Russell, 2018). Applying the framework and

methods of operations research to sex trafficking opens new possibilities for inquiry and exposes gaps in the current state of knowledge about trafficking (Caulkins et al., 2019; Konrad et al., 2017). Survivors of trafficking are critical knowledge holders with much-needed expertise, yet they are not often engaged as equals in research (Gerassi et al., 2017; Martin, 2013; Polaris Project, n.d.). Our transdisciplinary approach identifies areas where deep content expertise from lived experience in sex trafficking should be incorporated into the operations research modeling process (Sharkey et al., 2021).

This paper argues that team building, in and of itself, is an essential ingredient of community-engaged transdisciplinary research; and that functional teams are built on trust and *communication* which require deliberate effort and dedicated time. A rush to findings or attention only to research results at the expense of team building may hinder the team’s ability to integrate their perspectives and methods to achieve the research goals. While there is much agreement that deeply collaborative team science is needed to tackle thorny challenges like human trafficking, there is little research addressing how to do it. This study seeks to illuminate the idea of community-engaged transdisciplinary research and methods for team formation that can amplify the impact of scholarship outside the academy walls. The paper concludes by sharing methodological lessons learned from this study that are broadly relevant for research on trafficking and many other complex and vexing social challenges that span disciplinary boundaries.

Background on the MOST Team

The Principal Investigators (PI) of MOST met in 2017 at an invited workshop (Kammer-Kerwick et al., 2018); which led to a successful funding application to the National Science Foundation for a multi-site team. The prime award was to a PI at the University of Minnesota who also led the qualitative research in collaboration with a co-PI from RTI International. The operations research was led by co-PIs with sub-awards to Northeastern University and Clemson University.¹ To guide the project, identify ethical issues, and address gaps in knowledge, the project convened a sex trafficking survivor-centered advisory group with survivor-leaders. The MOST team had 15 members across these different areas of expertise during the meta-study time period.

The MOST project aims were to: (1) identify unique operational structures of sex trafficking supply networks; (2) translate qualitative data to populate dynamic operations

research models; (3) build a functional cross-disciplinary and multi-sector team; and (4) work together to verify model assumptions. Qualitative data collection entailed interviews with experts (including survivors), review of comprehensive law enforcement case files from the Minnesota Bureau of Criminal Apprehension (e.g. witness statements, background checks, investigative notes), secondary analysis of qualitative data from previous projects (Martin et al., 2017; Martin and Pierce et al., 2017), and a literature review.

The four aims required intentional focus on integrating knowledge to develop a shared and new network-based conceptualization of sex trafficking operations and a novel use of qualitative research methods to gather data points necessary for an operations research approach to mathematical modeling (Sharkey et al., 2021). MOST project included funded effort for PIs, project staff, and the advisory group to focus specifically on team building as one of the research aims. The primary project PI and a research fellow used and adapted their expertise in action research (e.g. Filoteo et al., 2021; Martin, 2013; Martin et al., 2018) as an approach to build the team and foster integration across disciplines and with the advisory group. Action research seeks to equalize power dynamics, build trust, and foster open communication in ways that are participatory, inclusive, democratic, and respectful (Bradbury, 2015; Stringer, 2014).

Team building among the researchers started with a 2-day, in-person meeting in December 2018 in Minneapolis hosted by the primary PI and her team. The agenda included facilitated sessions about values (e.g. ethics, principles, motivations), mini-lectures from team members on key points from their disciplines, socializing over meals, and a 2 hour Q&A session with a prosecutor and two law enforcement data analysts who specialized in sex trafficking. Future meetings followed this format with check-ins, ice-breakers, learning each other's communication styles and research methods, and focused conversations about language, terms, and the empirical evidence on trafficking. The researcher team members met regularly with two intensive 2-day meetings, a funder-sponsored convening, bi-monthly phone calls and Zoom meetings (online video meeting platform), ad hoc meetings, regular emails, and joint document creation.

The advisory group was convened by the team from the University of Minnesota and officially joined the project during the second in-person all-team meeting in Minneapolis in August 2019. They participated in content sessions followed by a social gathering over dinner. The PI and her team did not convene the advisory group right away because they first needed to understand the operations modeling process so they could explain it to potential advisory group members *before* inviting them to join the project. Upfront transparency and clarity was important because project content on networks of sex trafficking operations can re-traumatize survivors. This also provided time for the academic research team to build its internal rapport, break down disciplinary silos, and establish a trauma-informed approach before engaging with the advisory

group. The composition, goals, and processes for facilitating the advisory group were designed to minimize secondary trauma and provide a supportive environment for survivor-leaders to contribute their knowledge and expertise.

The advisory group met each month for a year and a half with facilitation from the University of Minnesota team. The advisory group wanted to work with the University of Minnesota team in the beginning so they could learn operations research concepts, build internal rapport, and freely contribute without fear of judgement. This helped set a level playing field where all members of the project were equally valued as people and knowledge holders. Meeting agendas and questions for the advisory group were crafted to contribute to the research as it evolved. Once the advisory group was comfortable, the operations researchers attended some advisory group meetings via Zoom to explain their disciplinary concepts and build rapport. However, this was after the meta-study timeframe. Knowledge, expertise, and advice from the advisory group were integrated into the project through detailed meeting notes that were shared with the whole team. Trafficking causes harm and is not an abstract data point or model for survivors. Thus, the advisory group helped the research team prioritize and conceptualize lived experience in the modeling process. These ethics were interwoven into decision-making as the team explored the relative merits and shortcomings of social science and mathematical approaches to modeling sex trafficking networks.

Due to the COVID-19 pandemic the team adopted an all-remote format. The project benefited from a swift integration of Zoom into the university systems and this facilitated more regular contact between team members in different locales. As is typical in action research, the full team did iterative cycles of co-creation (Stringer, 2014) to prototype data collection methods, develop a codebook (with descriptions of model elements, parameters and assumptions), analyze data, and triangulate across data sources. An iterative and improvisational approach was also used to facilitate the advisory group, to change and adapt in response to how the group reacted to project content. Through an intentional and staggered process of team building, the project was able to work together to conceptualize sex trafficking networks and identify prevention and intervention opportunities. These project findings and content will be described in depth elsewhere. The *integration* of disciplines, experiences, perspectives and data sources was facilitated by careful attention to team building, meeting facilitation, and creating shared values. The study described here was an effort by our team to surface key insights to understand the team formation process that undergirded the research itself.

Background Literature

Collaboration in team science takes many forms with multiple and potentially overlapping terms (e.g. multidisciplinary, interdisciplinary, convergence science,

transdisciplinary) which can cause confusion (Abeolela et al., 2007). We found that the combination of community-engaged and transdisciplinary approaches is a particularly impactful model for actionable scholarship on complex problems. Community-engaged approaches to research generally include community members as equal knowledge-holders in the research process and co-creators of research goals and direction (Brush et al., 2020; Bradbury, 2015; Heinzmann et al., 2019). This approach can be integrated within any academic field and is uniquely suited to transdisciplinary teams addressing real-world social challenges (Daly & Matzel, 2013; De la Torre, 2014; Heinzmann et al., 2019). Table 1 contains common terms with visual depictions of degrees of integration across disciplines and a working definition derived from the literature and the authors' practices in our work together.

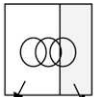
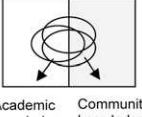
The notion of "transdisciplinarity" is seen as distinct from other forms of team science with a priority on *integration* of perspectives, methods, and theories to resolve problems (Heinzmann et al., 2019; Lotrecchiano & Misra, 2018; Stockols, 2006). However, integration across disciplines faces numerous barriers. Incentive structures within academia such as faculty promotion, publications, and research funding, reward individual achievements within disciplinary boundaries (Adler & Stewart, 2010). Work across disciplines can lead to increased workload (Townsend et al., 2015). Holland and Malone (2019) suggest the "focus on individual faculty work has contributed to loss of public appreciation of the roles of higher education in contributing to intellectual and public progress, well-being and equity" (p. 10). Disagreements about rigor, validity, and the relative importance of different

disciplines and methods within academia can stymie transdisciplinary research (Gray, 2008) by impeding the respect and trust needed to build a transdisciplinary team.

Compared to disciplinary teams, developing trust takes significantly more strategic effort for a transdisciplinary team (Guetterman et al., 2020; Gray, 2008; Harris & Lyon, 2013). Without shared language, similar training, and collaboration norms within a single discipline, transdisciplinary teams may be predisposed to misunderstanding in ways that inhibits trust-building. Adding community members to a transdisciplinary team brings even more complexity around trust, respect, and communication (Brush et al., 2020). Lack of shared terminology as well as different perspectives, conversational styles, and comfort levels with disagreement can hinder effective and open communication across disciplines (Monteiro & Keating, 2009; Norris et al., 2016) and between academics and other research stakeholders. Logistical challenges to transdisciplinary teams include selecting the right disciplines and people with complementary expertise, and determining team leadership and structure (Norris et al., 2016).

The literature suggests some strategies for addressing these barriers to communication and trust across disciplines. Shared and rotating team leadership is a potentially effective strategy for building trust in transdisciplinary teams (Gray, 2008; Guenter et al., 2017). Building on existing relationships among team members increases group productivity and cohesion (Goodman & Leyden, 1991; Hinds et al., 2000). Attention to relationship-building among team members promotes trust, mutual respect, and strong team culture (Cartmill et al., 2011; Guetterman et al., 2020; Townsend et al., 2015). For example, Nancarrow et al. (2013),

Table 1. Team Science Terms And Degree Of Integration Across Disciplines.

Term	Diagram	Definition
Disciplinary		Research contained within one discipline
Multidisciplinary		Different disciplines working side-by-side within a research team, not integrated (includes cross-disciplinary) (Stockols, 2006)
Interdisciplinary		Integration of knowledge and perspectives (but not necessarily methods) within a team made up of different disciplines (National Science Foundation, n.d. 1)
Convergence		Integration and merging of knowledge within a team made up of different disciplines, with an emphasis on new frameworks. Focus on "societal needs" and solving social problems (National Science Foundation, n.d. 2)
Transdisciplinary		Integrating knowledge and methods to create a unified framework within a team made up of different disciplines (Lotrecchiano & Misra, 2018; Stockols, 2006)
Community-engaged transdisciplinary		Merging of transdisciplinary approach with community-engaged research approaches; equal value of community and academic ways of knowing; project addresses social issues or challenges

Note. The idea to accompany text definitions with a diagram was derived from Jensenius, 2012 and North Carolina State University, 2020.

highlighted the “importance of informal relationships, camaraderie, fun, and friendship between colleagues” (p. 6) to promote interdisciplinary research. Shared agreement on terms and definitions, collaborative tasks, and timelines leads to confidence and motivation that improves team performance (Cannon-Bowers & Salas, 2001; DeChurch & Mesmer-Magnus, 2010; Gevers et al., 2020). Townsend et al. (2015) suggest a focus on what they call “small structures” (e.g. meaning and scholarly identity) to help facilitate interdisciplinarity (p. 672). Further, “it is clear from a considerable body of literature that successful interdisciplinary efforts require mastery of specific competencies” (Larson et al., 2011, p. 38). Lotrecchiano and Misra (2018) found that a deliberate fostering of interdependence among team members supports collaboration and team building because team members must rely on each other’s expertise to achieve a shared goal.

Finally, Monteiro and Keating (2009), suggest that misinterpretations and partial understanding across disciplines can become “productive misunderstandings” if strategies are in place to identify and work through them. Flagging erroneous interpretations and lack of common understanding of assumptions and premises (which can then be mitigated) ultimately leads to deeper shared understanding of the project, terms and conceptualizations (Monteiro & Keating, 2009, p. 25).

Community-engaged approaches to research have faced a steep climb in the academy. They are often viewed with skepticism, as biased or lacking rigor, despite mounting evidence that this approach yields important insights, practical application, and critical knowledge on thorny issues (Wallerstein, et al., 2020; Warren et al., 2018; Bradbury, 2015). Academic institutions pose significant logistical challenges to community-engaged research including cumbersome financial processes, large indirect cost rates, oversight requirements, copyright and intellectual property disputes, and research ethics challenges (Ferris et al., 2021; Stringer, 2014). Yet, there are deeper and more damaging barriers to marginalized communities’ participation in academic scholarship. Research abuses, the role of research in colonization and enslavement, power dynamics, and the harms and exclusions of current research practices has shaped a longstanding and justifiable lack of trust in academic research among Black and brown communities, indigenous peoples, and marginalized communities (George et al., 2014; Smith, 2012; Wallerstein et al., 2019). Doing research *with* communities and those most impacted by social issues and structural oppression, such as people with lived experience in trafficking, rather than *on* those communities, can ameliorate the objectification and knowledge extraction that can be part of traditional research methods (Ferris et al., 2021; Gerassi et al., 2017; Martin, 2013; Wallerstein, et al., 2020). Community-engaged teams must also grapple with misunderstandings and have persistence to work through challenges.

Methods

This qualitative meta-study sought to identify and describe processes, practices and approaches used for building the MOST team; and to document those that were most productive for team building. Based on the literature described above, three research questions guided the study. (1) What communication challenges and barriers were faced by the MOST team? How did the team address them? (2) Did communication help foster collaboration, cohesion, and trust? If so, how? (3) What other practices helped foster collaboration and trust? To answer these questions this study analyzed team meeting minutes and administered a survey.

Team Meeting Minutes

Team meeting minutes are a rich source of in situ data about team communication and cohesion (Guetterman et al., 2020; Monteiro & Keating, 2009). The co-lead author qualitatively coded minutes from 16 meetings between December 2018 and June 2020 (6 in-person and 10 via Zoom) that included team members from multiple disciplines. All of the meetings included qualitative and operations researchers, and one also included members of the advisory group. As noted above, the advisory group started almost a year into the project and they met separately at the beginning to establish their own knowledge base. Meetings were audio recorded to support note taking, thus minutes contain near verbatim notes describing attendance, agenda topics, and action items. Seven minutes included the names of speakers and nine did not. Team communication and project-related work also occurred via email, in smaller teams, and informal calls. It was deemed impractical to document, gather and analyze this content. The separate advisory group meeting minutes were not included in this meta-study. While an incredibly important source of information, advisory group meetings did not provide rich opportunities for *transdisciplinary* communication because the qualitative researchers’ role in these meetings was primarily facilitation and the operations research team did not have a regular presence at advisory group meetings during the meta-study time frame.

With mentorship from the lead author, the co-lead author read the minutes and drafted a codebook that identified emergent themes that were formalized into named codes. The draft was refined through three iterations of review with the full qualitative team and it was continually and iteratively revised in response to the data throughout the coding process. When the codebook changed, the co-lead author re-coded meeting minutes that had already been coded (Saldana, 2016). Rigor was established by following the six phases identified by Nowell et al., (2017) to establish “trustworthiness” in thematic analysis (p. 4).

Coding also identified “possible instances” of codes to capture content during instances where the meeting context was not clear (e.g. speakers’ names were not recorded or conversation referred to a slide or image that was not described

Table 2. Qualitative Themes from Meeting Minutes.

Theme	Definition	No.
Themes related to communications		
Clarification request	Clarifying question to someone who is part of a different discipline/team role	49
Collaboration statement	Discussion of the need for collaboration, interdependence, and integration across disciplines	47
Challenge	Running into a challenge or limitation when discussing concepts and questions	26
Term/Vocab discussion	Discussion of definitions of terms, particular words with multiple meanings in different contexts	19
Other salient themes		
Value statement	Discussions of ethics, the goals of the team, and long-term values	46
Team building	Undergoing an activity or discussion focused on internally strengthening the team	17

in the notes). Content within each code was then thematically analyzed and is described in the results below.

Survey Methods

The team developed a 16-item Qualtrics survey combining Likert scale and short-answer questions with concepts from the literature on transdisciplinary communication. Questions explored trust, team roles, team values, soft skills, barriers to communicating across academic disciplines and the advisory group, team culture, successes, and needs for improvement. An email invitation was sent all team members, including the advisory group, in June 2020. The survey did not ask for identifiable information, but due to the small number of people and self-reported team roles, it was not possible to ensure anonymity. To promote honest responses, the invitation and opening text explained that the survey was specifically looking to identify areas for improvement and things that were not yet working well. For analysis, responses were explored as a whole and also grouped by project role to identify any trends within disciplines and perspectives versus the team as a whole.

Results

Thematic Coding Results

Thematic analysis of meeting minutes yielded six codes related to the meta-study research questions. Four pertained directly to communication tactics and barriers (clarification request, collaboration statement, challenge, terms and vocabulary discussion), one focused on value statements made by team members, and one captured instances of intentional team building strategies used during meetings. Table 2 provides a list of codes, their definitions, and the number of instances they appeared in the meeting minutes. The coding counts refer to instances, not length of time spent on each theme. The codes were developed to capture nuance, not discrete categories; thus, some content was included within multiple codes. The option for possible instances is included in Table 2 and was only used in two themes, collaboration statement ($N=4$) and clarification request ($N=2$). Below, we describe findings in each theme.

Communication themes. Clarification Request. This was the most common type of communication identified in the meeting minutes ($N=49$). It refers to asking a clarifying question to someone from a different perspective (e.g. operations to qualitative researcher, or operations researcher to an advisory group member) about terms, concepts, framing, and methods. For example, the team required a clear and shared understanding of the discipline-specific meaning of the operations research terms of “node” and “arc” which are used to conceptualize networks for mathematical modeling and visualization. These terms were not as familiar to the qualitative researchers or the advisory group, so discussion and time were needed to develop shared understanding. This process happened with many other terms and research methods. Examples of this included discussion of differing definitions of words such as “cyber” and “model,” clarifying data collection procedures, or navigating how to approach conversations with the advisory group or partners at the Minnesota Bureau of Criminal Apprehension.

Clarification requests were motivated by specific research-related tasks (e.g. designing a data collection spreadsheet) that toggled between team members from different disciplines. Extensive clarification requests centered on explanations of the law enforcement data and the network-based information it contained because only the qualitative researchers could view the data due to the unique data sharing agreement between the University of Minnesota and the Minnesota Bureau of Criminal Apprehension. The meeting minutes reflect how this created an unintended effect of necessary interdependence between disciplines that pushed the team to learn more about each other’s concepts, knowledge, worldview, framing, and methods. Asking clarifying questions over time led to shared meaning and a unified methodology for capturing data points needed for modeling from qualitative data sources. Clarification requests fostered the integration of concepts, frameworks and methods by promoting an iterative toggling between disciplines and methods to establish a new way of gathering data to support the transdisciplinary modeling goals.

Collaboration Statement. Collaboration statements were the second most commonly used code in the meeting minutes ($N=47$), capturing team discussions about the integration of disciplines in order to address a gap in knowledge. Similar to

the theme on clarification requests, there were many collaboration statements around creating the methods for data collection from law enforcement sources. This was a central project task that was both procedural and conceptual. The example below shows how a clarification request flowed into a collaboration statement. One qualitative researcher said, “how do we translate codebook decisions in the Excel [data collection spreadsheet]?” After more detail from other qualitative researchers on the team, an operations researcher replied, “from a troubleshooting perspective, I’m not sure if Excel is smart enough to go back and change everything. [...] *I can certainly help a little bit if you want to brainstorm ideas*” (collaboration statement is italicized). This small procedural collaboration was instrumental in creating a shared data collection method across the qualitative social science and operations research disciplines.

Collaboration statements also included discussions among researcher team members identifying topics and concepts where advisory group input was needed or when the operations researchers should join an advisory group meeting. For example, research team members highlighted the need for the advisory group to provide deeper contextual information about critical information not contained in other data sources, such as the types of social connections that support trafficking networks.

In conversations identified as collaboration statements, team members deliberately built interdependence and integration of the different knowledge bases among the qualitative researchers, operations researchers and advisory group. Rather than seeking parallel work, this code shows how the team spent time building collaboration across perspectives through focused conversation and joint work.

Challenge. The challenge code identified instances when the team hit a roadblock or limitation to shared understanding beyond needing a simple clarification ($N=26$). Challenges flagged areas of deeper misunderstanding or misalignment in how team members from different disciplines and perspectives understood a particular issue, concept or method. For example, the team discussed a network modeling software used by law enforcement and wondered if our project would add value to that tool or if the team should try to use the same tool. The issue was not easily resolved and required more investigation and follow-up.

Operations research models require a precision of detail that is often not possible in sex trafficking research. Thus, many challenges requiring sustained deliberation arose in response to creating a qualitative codebook of themes and definitions used to extract data from sources. This included decision-making about how to model specific network elements like phones, phone numbers and sex ads; or whether and how to include people only tangentially involved in trafficking activities but who were part of the sex trafficking operational networks. In many of these discussions there was no definitive “right” answer, but decisions had to be made with clearly described assumptions and reasoning.

In some meetings the team stepped outside their agenda to try to resolve a challenge on the spot, but this did not typically lead to a resolution. Meeting minutes suggest that it was more effective for the team to table challenges and return to them later because they usually required more thought or additional information gathering to resolve.

Term and Vocabulary Discussion. These discussions ($N=14$) were triggered by words used across disciplines with different meanings, a common word that also has a technical meaning, and explanations of academic or trafficking-specific terms. Confusion about terms inhibited some communication because the misunderstanding was masked by a surface appearance of shared meaning. This theme captures discussion of term definition once the team identified a lack of shared meaning. For example, operations researchers used the term “code” to refer to computer software; whereas for qualitative researchers the term referred to thematic or qualitative coding. The project used both aspects of the term. The word “code” created confusion for months because team members thought they had shared understanding, but they did not.

While not the most common theme, these discussions were critical to developing strong communication. Many additional discussions about disciplinary terms and their meanings occurred through emails that were not analyzed as part of this study.

Value Statements. Value statements were the third most commonly identified theme ($N=46$), capturing discussions of ethics, goals, principles, and values. It was an agenda item and a topic that arose spontaneously as the team worked to develop a shared approach to modeling sex trafficking networks with the important recognition that trafficking is not just an abstract concept; it causes real-world harm to people. The advisory group and the rest of the team explicitly stated they did not want our research process of modeling the operational networks to sanitize the violence, degradation, harm, manipulation and pain that sex trafficking causes. Numerous value statements affirmed a shared commitment to the public value of potential findings, in particular the need to reduce the harms of trafficking to survivors, potential victims of trafficking, and communities. Survivor-leaders in particular saw the research as a way to impact the field, one member stated, “I personally think it’s important to have our voices heard and be involved in this.”

Finally, value statements arose from the team’s commitment to team building, surfacing three practical principles: 1) rotate PIs across participating institutions as new funding opportunities arise; 2) provide leadership opportunities for all team members; and 3) invite all team members to participate in dissemination, as appropriate. Discussion and reaffirmation of shared values helped team members build mutual respect while breaking down disciplinary silos and bridging different perspectives. It also kept the team motivated to work through the inevitable disagreements or confusions.

Table 3. Summary of Closed-ended Survey Questions and Answers.

Question	Response Options	Results
What is your role on the team?	(Multiple choice) <i>qualitative research, operations research, advisory group</i>	Total N=13 (QR=5, OR=2, and AG=6)
What factors are important for you to build a good working relationship with everyone on this team?	(Each ranked by importance) <i>trust, transparency, openness, valuing everyone's knowledge, flexibility, integrity, ethics, sensitivity</i>	All respondents selected trust, transparency, openness, integrity, and ethics as very important. Valuing each other's knowledge was selected as very important (N=10) or important (N=3). All QR members also indicated flexibility and sensitivity as important or very important, OR and QR were more mixed.
What factors are important to you to develop trust in your team members?	(Each ranked by importance) <i>knowledge/competence, personality, openness, finding common ground, integrity, transparency, other</i>	All respondents selected integrity and transparency as the two most important factors (very important or somewhat important). Most also identified knowledge/competence, openness, and finding common ground as important or somewhat important. Personality was least identified as important.
Our team has been using the following tactics in order to share ideas and community remotely and across disciplines. Please assess the effectiveness of each tactic.	(Each ranked by effectiveness) <i>openness in asking and answering questions, regular emailing, regular Zoom/in-person meetings, drawing or creating diagrams to discuss questions, having multiple people of the same discipline explain an answer, meeting minutes, meeting recordings, other</i>	All respondents selected openness in asking and answering questions as very effective (N=13). Most selected emailing as very or somewhat effective (N=12). Regular zoom/in-person meetings were considered very effective (N=9) and somewhat effective (N=3). Drawing or creating diagrams to discuss questions was considered very effective (N=11) and neither effective nor ineffective (N=1). Multiple people in the same discipline were identified as very effective (N=8), somewhat effective (N=3) and neither effective nor ineffective (N=1). Meetings minutes were similar, and meeting recordings were deemed less effective.
Consider someone of a different discipline or field is explaining part of their work, and you are having difficulty understanding. Would you feel comfortable asking for clarification?	(Multiple choice) <i>yes, no, it depends</i>	Yes=11, No=0, it depends=1 (this was a QR team member who indicated in an open-ended follow-up that their comfort took time to develop)

Team Building Strategies. Team building was a specific project aim, so it is no surprise that minutes contain evidence of specific team building strategies (N=17). Planned, meeting-based team building activities included short personal check-ins at the beginning of meetings, ice-breakers, reflections on the work, and activities to clarify team values. Team building was deliberate at the beginning of the project, and more informal later. However, most instances of team building were not well captured in meeting minutes. Notes were not taken during the opening check-in portion of each meeting agenda (approximately 15 minutes) or during socializing outside of formal meetings (e.g. team dinners). Meeting minutes reflect that building the team and forming friendships and personal relationships helped team members feel comfortable and safe to challenge each other, ask questions, and grapple with confusions.

Survey Results

Fifteen members of the MOST team were invited and 13 completed the survey, including qualitative researchers (N=5), operations researchers (N=2), and the advisory group (N=6). Two former advisory group members were invited but did not participate. Survey responses showed much agreement on the values, qualities and strategies that helped build an effective and functional team across disciplines and with the survivor-leaders. Table 3 summarizes responses to closed-ended survey questions and Table 4 summarizes responses to open-ended questions.

According to the survey, participants broadly agreed on interpersonal qualities and team norms that were important for team building and transdisciplinary communication. For example, everyone who completed the survey identified

Table 4. Summary of Open-Ended Survey Questions and Answers.

Question/Response Options	Results (Summary of Responses)
How do you approach building a working relationship with everyone on this team?	All indicated that relationships were built by showing an interest in each other's work and through curiosity and active-listening; as well as cultivating personal connections and understandings on an individual level. Some indicated that they don't normally do "ice-breakers" but found them helpful in this team.
Please tell us more about what helps you build trust in your team members?	All indicated that spending time with each, sharing, and being vulnerable builds trust; as well as being transparent, asking questions and being open to learning. Some mentioned the need to talk respectfully. The AG highlighted the need to not be confrontational, having "complete respect" for each other, and healing from their trafficking experiences.
What interpersonal and communication strengths do you believe YOU bring to the most team?	Responses emphasis varied by role. • QR: cultural competence, listening, open, empathy, care and understanding • OR: translating complex ideas, listening • AG: patience, respect, active listening and empathy
After joining the transdisciplinary team what were some of the challenges you encountered? How do you think these challenges can be resolved?	All respondents indicated difficulties in learning each other's disciplines, perspectives and terms. Agreement that a team culture with open questioning and detailed note taking helped overcome these communication challenges. Additional challenges varied by role. • QR: learning operational research methods and vocabulary and sharing it with the AG • OR: at the beginning unsure how all the perspectives would come together for modeling, especially how the AG would fit • AG: some indicated a challenge related to processing past experiences of exploitation, others mentioned difficulty fitting the time commitment in with their other work responsibilities
How do you best handle conflict or disagreement?	Respondents focused on the importance of clarifying the problem and carefully reflecting on the conflict. There wasn't strong agreement; some respondents prefer conflicts to be resolved swiftly and others prefer conflicts to be resolved over time
How would you like the team to handle conflicts or disagreements?	Respondents agreed that individual conflicts should be resolved by the individuals, and conflicts that involve the whole team should be resolved as a group
How would you like someone to answer your questions? Are there any tactics that you would like the person answering your questions to use?	Responses emphasis varied by role. • QR: follow up questions to ensure understanding, use simplest terms, take time to answer question, non-judgmental • OR: make sure you understand the question, take time to answer • AG: respect, seek understanding versus assumptions, hands-on visuals
What do you believe is the most important outcome/goal of the MOST project?	Respondents identified these goals: Develop models that are accurate; avoid harming victims; learn from each other; develop the transdisciplinary team as a foundation; provide useful information for decision-making and work in the real-world.
Is there anything else you think we should know about how the team functions? This includes things you like or things we could improve on.	All respondents indicated that they appreciate/enjoy being part of this team (e.g. "I love this team."). Some mentioned the challenges of the project in the wake of COVID-19. Respondents expressed appreciation for all the different perspectives (e.g. "I feel the team is very rounded"). One person on the AG wished we met more often.

integrity, transparency, trust, openness, and ethics as essential. Answers across open-ended questions suggested that trust between team members allowed team members to feel safe to ask questions and share what they know without fear of being judged. This was especially important in breaking down silos

between the academic researchers and survivor-leaders so that knowledge could be shared with respect; as well as between mathematically-oriented and qualitative researchers. Further, mutual respect, curiosity and a culture of open and kind questioning fostered deep transdisciplinary communication.

Some differences were noted in survey answers between the operations research and qualitative perspectives. For example, qualitative researchers identified “sensitivity” and “flexibility” as important for building good working relationships, whereas the operations researchers prioritized “openness.” When asked to identify interpersonal communication strengths, the qualitative and operations researchers highlighted slightly different things. Qualitative researchers focused on the ability to listen and understand other perspectives. One qualitative respondent stated, “...I am able to synthesize different perspectives using reflective listening skills.” The qualitative team also highlighted the process and challenge of learning the methods and terminology from operations research. It was important to them to fully comprehend the approach behind the mathematical modeling, rather than just leaving the math to the operations research team. This process of understanding technical terminology and quantitative perspective was challenging and took time. As one qualitative respondent said, “It can be hard to find the balance between sitting with something long enough to develop shared knowledge AND moving the project goals forward and completing tasks.”

Operations research team members focused on the challenges of understanding the perspectives of the entire team and how the processes of facilitated team meetings would eventually lead to understanding across disciplines and the survivor-centered advisory group. One operations researcher stated, “I think the biggest challenge has been understanding how the research pieces and goals across all disciplines fit together... I think it would be a challenge to understand how the AG [advisory group] fit into the OR [operations research] work, but it really came together well in practice.” Both qualitative and operations researchers expressed initial difficulty in fully understanding the work of the other disciplines. However, team meetings, retreats, and a culture of asking questions were attributed to overcoming these challenges.

The advisory group echoed many of these themes but also identified patience, respect and empathy as necessary supports to their work on the team. Advisory group members said that trust was built through an open and non-confrontational environment, where participants were “...not afraid to speak the truth and are in that spot where they can be transparent about their experiences without the fear of repercussion, embarrassment or shame.” The advisory group described the unique challenge of reflecting on past memories and experiences of trafficking. While difficult, advisory group members added that they appreciated being a part of this team. As one advisory group member stated, “Those of us who have been trafficked may never completely heal, but this type of energy spent on doing the right thing and making a difference is wonderful.”

Discussion

This qualitative meta-study of the MOST team sought to understand *how* communication and trust helped to build a

community-engaged transdisciplinary research team seeking to create mathematical models of sex trafficking networks. According to Stockols (2006), “transdisciplinarity is a process by which researchers work together to develop a shared conceptual framework that integrates and extends discipline-based concepts, theories and methods to address a common research topic” (p. 67). Adding real world expertise offers the promise for more grounded conceptual frameworks that can be more easily used in practice (Bradbury, 2015; Beaulieu, et al., 2018; Wallerstein et al., 2020).

Methods included qualitative coding of meeting minutes and a survey of team members about communication, values, trust and team functioning. Results identified team building strategies and approaches that helped foster a functional transdisciplinary research team that included survivor-leaders in an advisory group. Findings of this meta-study show that *integration* of methods and content in the MOST team was facilitated by establishing personal connections, delineating shared values and cultivating key qualities within team functioning (e.g. integrity, transparency, respect, and openness).

The literature highlights a number of intangible qualities that are critical for supporting community partnerships in research, including open communication, building trust, and attending to power differentials (Wallerstein et al., 2019; Brush et al., 2020). Communication, and managing miscommunication, has been found to be key to transdisciplinary and community-based research (Monteiro & Keating, 2009). For example, a recent scoping review of the literature identified effective communication as an indicator of successful community-based participatory research (Brush et al., 2020, p. 562). Yet the distinct and specific qualities and concrete strategies needed to foster effective communication and build trust among community-based transdisciplinary teams are less well documented. Communication was demonstrated in four of the six thematic codes from meeting minutes and in numerous survey responses. The qualities of communication that lead to greater shared understanding included the role of clarifications, open questioning without defensiveness, digging into deeper meanings within common terms, checking-in with each other on a personal level, listening, and respect. The survey helped the team identify members’ preferred communication and conflict-resolution style, allowing team members to disagree in ways that felt respectful. It also showed that team members felt that project communication fostered trust because it was rooted in transparency, integrity and respect for all the different perspectives.

There is a growing critique of conventional science in academia and its limitations for real-world outcomes (Levin & Greenwood, 2017; Bradbury, 2015; Holland & Malone, 2019; Warren, et al., 2018). In this space, working together across disciplines (Caulkins et al., 2019; Solis, 2016; Stockols, 2006) and with communities (Wallerstein et al., 2020; Sandwick et al., 2018) has shown promise to tackle big challenges by bridging silos with integrated knowledge. Greater numbers

and diversity of perspectives among partners in a community-based transdisciplinary team leads to bigger barriers (Stockols, 2006). Much of the literature identifies barriers such as institutional disincentives (e.g. bureaucracies, leadership style, and disciplinary boundaries), the need for specific skills and competencies to foster cross-disciplinary work, and insufficient time and funds for forming relationships (Townsend et al., 2015; Gray, 2008; Larson et al., 2011; Norris et al., 2016; Guetterman, et al., 2020). Other, more difficult challenges, are rooted in power differentials and lack of trust and respect between academia and marginalized communities (Wallerstein et al., 2019; George et al., 2014; Heinzmann et al., 2019).

To ameliorate some of these potential barriers, the MOST team chose a slow and deliberate process to first build connections and disciplinary merging among the research team, and then to integrate the survivor-centered advisory group into the research process. The process was particularly attentive to power imbalances and provided support to community partners so they were prepared to engage in conversations from a place of knowledge and respect. Thus, as evidenced in the survey, advisory group members felt comfortable to contribute their considerable content expertise, challenge the research team, and ask tough questions. And the researchers on the team were prepared to operate using trauma-informed methods and also to hear and respond to critiques from the advisory group.

Findings in this meta-study suggest that intentional focus on values, ethics and impact of the work motivated all the team members to participate, show vulnerability, and ultimately build trust as they developed a shared understanding of project content and methods over time. The larger purpose behind the research was identified in the survey as a uniting force for all team members, even when things got tough. It can be tempting to skip the hard work of team building with team structures and processes designed to jump straight to results or findings. Our study suggests that forming trust through open and transparent communication among the team is necessary to merge and integrate across disciplines and perspectives; and that new conceptualizations and data flow from there. Further, the meta-study study offers insight into the kinds of communications and processes that fostered team building.

Implications for Practice

The purpose of this study was to share insights from our community-engaged transdisciplinary team to help others embarking on similar types of team science to overcome common barriers. We recommend the following to foster team building in community-engaged transdisciplinary research teams.

1. An action research approach is helpful in building teams across disciplines as well as with communities outside of academia, because it prioritizes respect and

value for multiple forms of knowledge, attention and time for getting to know each other, equalizing potential power dynamics among team members, and real-world actionability (Bradbury, 2015; Stockols, 2006).

2. Attention to values, principles and ethics is a glue to build connections across silos created by academic disciplines and community experiences. A common focus helped the team stay with hard and confusing conversations, often over the course of months. The team's focus on the potential for real-world application helped drive the work in a shared direction. The advisory group provided a moral compass, while filling in knowledge gaps.
3. Time for informal check-ins and socializing is necessary to achieve the levels of integration required to develop new models and innovative thinking. Personal connections fostered the trust and vulnerability necessary to ask and receive questions without defensiveness.
4. Trauma and healing-centered practices in team building activities give space for team members to participate with their whole selves. The topic of sex trafficking, like many vexing social challenges, can be emotionally difficult, sad and painful. The team used mindfulness and other reflective practices so that members could process and explore traumatic information. Meetings were flexible and offered participants many choices in how they contribute, in line with trauma-informed care. These practices support people with lived experience to meaningfully contribute their expertise given the risk of re-traumatization and the potential for stigma (Suckach et al., 2018). It can also reduce the risk of secondary or vicarious trauma and reduce the risks for burnout or compassion fatigue (Suckach et al., 2018).
5. Allow everyone enough time to get up to speed on the project to feel more comfortable contributing. The project took a staggered approach to involving the advisory group so they had time to learn the content and the researchers who were new to the topic of sex trafficking had time to learn about lived experience prior to bringing everyone together. It was an important foundation for the advisory group to build their own rapport, learn about operations network modeling in their own time, and build trust slowly with operations research team members.
6. Leave room in meeting agendas for discussion of terms and vocabulary; and allow flexibility to go off track on the agenda as needed because it takes time and repeated discussion to come to shared understanding. Communication moments where the team veered off the planned agenda allowed for *misunderstanding* to become "productive" so that it fostered communication and team cohesion (Monteiro & Keating, 2009).

7. Include “mini-lectures” in the agenda and invite team members, including students and research staff, to present the basics of their discipline, approach or perspective. Qualitative team members did not need to learn the math formulas or how to write computer code, but they did need to understand how operations researchers conceptualize network structures. Likewise, operations research team members did not need to become experts in qualitative data collection or analysis, but they did need to understand the format and content of the data, general principles of data collection, and the limitations of the data. The advisory group needed to learn about the overall approach, key terms and definitions, models, and data collection so they could meaningfully contribute their expertise. From them, the whole team learned about unintended consequences, ethics, and real-world terms, concepts and experiences to inform the research. This all took time but was a critical foundation to developing new models and approaches.
8. Funding for community-engaged transdisciplinary research teams should include staff time for team building and forming relationships, including shared meals. The integration of knowledge and methods requires vulnerability and trust that one’s questions will be respected. Respect and trust flow from relationships that grow over time. This relational approach provides a container in which to work through the challenges that ultimately drive integration. Yet, as noted above, there is often a mismatch in funding streams and academic reward structures that typically do not support or value relationship-building as part and parcel of a research project.

Limitations

This study has limitations. This was not an outside evaluation. Data was collected by the team to document the work and inform the process. Given that the team is small it is possible that some team members were not comfortable in providing negative feedback as part of the meta-study. The study was not able to include all potentially relevant information for logistical reasons. Minutes and notes were not taken during social activities. Likewise, it was not feasible to collect and analyze project communication that occurred through email, co-drafting of documents, and notes from the numerous small group meetings. These data would surely shed more light on community-engaged transdisciplinary research team building. It is also likely that less formal meetings that were not documented set the stage for how communication happened in the formal meetings. Finally, meeting minutes and notes were taken by different research assistants, resulting in minor inconsistency in how the notes were documented.

Conclusion

The most vexing social problems are not confined to any one discipline or to academic and research-based ways of knowing. Collaborative research and new perspectives are needed to spur innovation and new frameworks for research to address big social challenges. This meta-study suggests that time taken to truly learn each other’s language and develop shared meaning leads to trust. Communication and trust are frequently described as necessary for community-based research, yet they are an often overlooked foundation for collaborative research across academic disciplines. Trust provided a foundation for the MOST project to build a cohesive community-engaged transdisciplinary team that integrates content knowledge of sex trafficking, lived experience, qualitative and operations research methods, action research approaches, and operations research conceptualizations of networks. Our findings show that team science in community-engaged transdisciplinary research is as much about team building itself as it is about the science (i.e. knowledge generation, methods and project design, and dissemination findings). These findings about methodological approaches to community-engaged transdisciplinary research are relevant for other projects seeking real-world impact.

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The authors want to acknowledge that a research project cannot truly encompass the complexity of lived experience in human trafficking. People with lived experience are expert knowledge holders. Our goal as a community-engaged transdisciplinary team is to surface key insights about the networks and functioning of human trafficking operations to help support decision-making in the field in ways to prevent trafficking and the harms it causes.

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Note

1. This co-PI moved to Clemson University from Rensselaer Polytechnic Institute near the end of the project.

References

- Abeolela, S. W., Larson, E., Bakken, S., Carrasquillo, O., Formicola, A., Glied, S., Haas, J., & Gebbie, K. (2007). Defining interdisciplinary research: Conclusions from a critical review of the literature. *HSR: Health Services Research*, 42(1), 329–346. <https://doi.org/10.1111/j.1475-6773.2006.00621.x>
- Adler, N. E., & Stewart, J. (2010). Using team science to address health disparities: MacArthur network as case example. *Annals of the New York Academy of Sciences*, 1186(1), 252–260. <https://doi.org/10.1111/j.1749-6632.2009.05335.x>
- Beaulieu, M., Breton, M., & Brousselle, A. (2018). Conceptualizing 20 years of engaged scholarship: A scoping review. *PLoS ONE*, 13(2), 1–17. <https://doi.org/10.1371/journal.pone.0193201>
- Bradbury, H. (2015). Introduction: How to situate and define action research. In H. Bradbury (Ed.), *The SAGE handbook of action research* (3rd ed.). SAGE Publications Inc. <https://dx.doi.org/10.4135/9781473921290>
- Brush, B. L., Mentz, G., Jensen, M., Jacobs, B., Saylor, K., Rowe, Z., Israel, B., & Lachance, L. (2020). Success in long-standing community-based participatory research (CBPR) partnerships: A scoping literature review. *Health Education & Behavior*, 47(4), 556–568. <https://doi.org/10.1177/1090198119882989>
- Cannon-Bowers, J. A., & Salas, E. (2001). Reflections on shared cognition. *Journal of Organizational Behavior*, 22(2), 195–202. <https://doi.org/10.1002/job.82>
- Cartmill, C., Soklaridis, S., & Cassidy, J. D. (2011). Transdisciplinary teamwork: The experience of clinicians at a functional restoration program. *Journal of Occupational Rehabilitation*, 21(1), 1–8. <https://doi.org/10.1007/s10926-010-9247-3>
- Caulkins, J., Kammer-Kerwick, M., Maass, K. L., Martin, L., & Sharkey, T. (2019). A call to the engineering community to address human trafficking. *The Bridge: National Academy of Engineering*, 49(3), 67–73. <http://dx.doi.org/10.26153/tsw/3207>
- Daly, D., & Matzel, S. C. (2013). Building a transdisciplinary approach to palliative care in an acute care setting. *Omega: Journal of Death and Dying*, 67(1-2), 43–51. <https://doi.org/10.2190/OM.67.1-2.e>
- De la Torre, A. (2014). Benevolent paradox: Integrating community-based empowerment and transdisciplinary research approaches into traditional frameworks to increase funding and long-term sustainability of Chicano-community research programs. *Journal of Hispanic Higher Education*, 13(2), 116–134. <https://doi.org/10.1177/1538192713515909>
- DeChurch, L. A., & Mesmer-Magnus, J. R. (2010). The cognitive underpinnings of effective teamwork. *Journal of Applied Psychology*, 95(1), 32–53. <https://doi.org/10.1037/a0017328>
- Farrell, A., & de Vries, I. (2019). Measuring the nature and prevalence of human trafficking. In J. A. Winterdyk, & J. Jones (Eds), *The Palgrave international handbook of human trafficking*. Springer International Publishing. https://doi.org/10.1007/978-3-319-63058-8_6
- Ferris, S., Lebovitch, A., & Allard, D. (2021). Sex work research, ethics review processes, and institutional challenges for “sensitive” collaborative research. *International Journal of Qualitative Methods*, 20, 1–12. <https://doi.org/10.1177/16094069211033437>
- Filoteo, M., Singerhouse, E., Crespo-Carrión, T., & Martin, L. (2021). Virtual engagement of youth in the time of COVID-19 and social uprisings: Youth voice, sex trading, and the future of engaged research. *Journal of Higher Education Outreach and Engagement*, 25(3).
- Furco, A. (2010). The engaged campus: Toward a comprehensive approach to public engagement. *British Journal of Education Studies*, 58(4), 375–390. <https://doi.org/10.1080/00071005.2010.527656>
- George, S., Duran, N., & Norris, K. (2014). A systematic review of barriers and facilitators to minority research participation among African Americans, Latinos, Asian Americans, and Pacific Islanders. *American Journal of Public Health*, 104(2), e16–e31. <https://doi.org/10.2105/AJPH.2013.301706>
- Gerassi, L., Edmond, T., & Nichols, A. (2017). Design strategies from sexual exploitation and sex work studies among women and girls: Methodological considerations in a hidden and vulnerable population. *Action Research*, 15(2), 161–176. <https://doi.org/10.1177/1476750316630387>
- Gevers, J. M.P., Li, J., Rutte, C. G., & Van Eerde, W. (2020). How dynamics in perceptual shared cognition and team potency predict team performance. *Journal of Occupational and Organizational Psychology*, 93(1), 134–157. <https://doi.org/10.1111/joop.12287>
- Goodman, P. S., & Leyden, D. P. (1991). Familiarity and group productivity. *Journal of Applied Psychology*, 76(4), 578–586. <https://doi.org/10.1037/0021-9010.76.4.578>
- Gray, B. (2008). Enhancing transdisciplinary research through collaborative leadership. *American Journal of Preventive Medicine*, 35(2), S124–S132. <https://doi.org/10.1016/j.amepre.2008.03.037>
- Gunter, H., Gardner, W. L., McCauley, K. D., Randolph-Seng, B., & Prahbu, V. P. (2017). Shared authentic leadership in research teams: Testing a multiple mediation model. *Small Group Research*, 48(6), 719–765. <https://doi.org/10.1177/1046496417732403>
- Guetterman, T. C., Abir, M., Nallamotheu, B. K., Fouche, S., Nham, W., Nelson, C., Mendel, P., Forbush, b., Shields, T. A., Setodji, C. M., Hsu, A. P., Domeier, R. M., Kronick, S., Neumar, R. W., & Feters, M. D. (2020). The process of team building among content experts and methodologists: An example from an emergency medicine services research investigation kick-off meeting. *International Journal of Qualitative Methods*, 19, 1–11. <https://doi.org/10.1177/1609406920955117>
- Harris, F., & Lyon, F. (2013). Transdisciplinary environmental research: Building trust across professional cultures. *Environmental Science & Policy*, 31, 109–119. <https://doi.org/10.1016/j.envsci.2013.02.006>
- Heinzmann, J., Simonson, A., & Kenyon, D. B. (2019). A transdisciplinary approach is essential to community-based research with American Indian populations. *American Indian and Alaska Native Mental Health Research*, 26(2), 15–41. <https://doi.org/10.5820/aian.2602.2019.15>
- Hinds, P. J., Carley, K. M., Krackhardt, D., & Wholey, D. (2000). Choosing work group members: Balancing similarity, competence, and familiarity. *Organizational Behavior and Human*

- Decision Processes*, 81(2), 226–251. <https://doi.org/10.1006/obhd.1999.2875>
- Holland, B., & Malone, M. (2019). Editorial: Institutional engagement - intentional, innovative and rigorous. *Gateways*, 12(2), 1–6. <https://doi.org/10.5130/ijcre.v12i2.6984>
- Jensenius, A. R. (2012). Disciplinarity: intra, cross, multi, inter, trans.” (blog). March 12, 2020 <https://www.arj.no/2012/03/12/disciplinarity-2/#:~:text=Interdisciplinary%3A%20integrating%20knowledge%20and%20methods,frameworks%20beyond%20the%20disciplinary%20perspectives>
- Kammer-Kerwick, M., Busch-Armedariz, N., & Talley, M. (2018). *Disrupting illicit supply networks: New applications of operations research and data analytics to end modern slavery. Workshop report and proposed research agenda*. University of Texas. <https://repositories.lib.utexas.edu/bitstream/handle/2152/68149/kammer-kerwick-2018-nsf-disrupting-illicit-supply-networks.pdf?sequence=2>
- Konrad, R., Trapp, A., Andrew, C., Palmbach, T. M., & Blom, J. S. (2017). Overcoming human trafficking via operations research and analytics: Opportunities for methods, models, and applications. *European Journal of Operational Research*, 259(2), 733–745. <https://doi.org/10.1016/j.ejor.2016.10.049>
- Larson, E. L., Landers, T. F., & Begg, M., D. (2011). Building interdisciplinary research models: A didactic course to prepare interdisciplinary scholars and faculty. *Clinical Translation Society*, 4(1), 38–41. <https://doi.org/10.1111/j.1752-8062.2010.00258.x>
- Levin, M., & Greenwood, D. (2017). Creating a new public university and reviving democracy: Action research in higher education. In: *Higher education in critical perspective: Practices and policies* (volume 2). Berghahn. <https://doi.org/10.2307/j.ctvss40p6>
- Lotrecchiano, G. R., & Misra, S. (2018). Transdisciplinary knowledge producing teams: Toward a complex systems perspective. *Informing Science*, 21, 51–74. <https://doi.org/10.28945/4086>
- Martin, L. (2013). Sampling and sex trading: Lessons on research design from the street. *Action Research*, 11(3), 220–235. <https://doi.org/10.1177/1476750313488146>
- Martin, L., Fan, Y., Duke, N., Hearst, M. O., & Jordan, C. (2016). The Scholars Program learning circle: An example of capacity building in the academy for engaged team science. *Journal of Community Engagement and Higher Education*, 8(3), 16–24.
- Martin, L., Melander, C., Fogel, K. F., Saito, B., McKenzie, M. G., & Park, R. (2018). *Safe harbor for all: Results from a statewide strategic planning process in Minnesota*. University Digital Conservancy, University of Minnesota. <https://hdl.handle.net/11299/226593>
- Martin, L., Melander, C., Karnik, H., & Nakamura, C. (2017). *Mapping the demand: Sex buyers in the state of Minnesota*. University Digital Conservancy, University of Minnesota. <https://hdl.handle.net/11299/226521>
- Martin, L., Pierce, A., Peyton, S., Gabilondo, A. I., & Tupule, G. (2014). *Mapping the market for sex with minor trafficked girls in Minneapolis: Structures functions, and patterns*. University Digital Conservancy, University of Minnesota. <https://hdl.handle.net/11299/226753>
- Monteiro, M., & Keating, E. (2009). Managing misunderstandings: The role of language in interdisciplinary scientific collaboration. *Science Communication*, 31(1), 6–28. <https://doi.org/10.1177/1075547008330922>
- Nancarrow, S. A., Booth, A., Ariss, S., Smith, T., Enderby, P., & Roots, A. (2013). Ten principles of good interdisciplinary team work. *Human Resources for Health*, 11(19). <https://doi.org/10.1186/1478-4491-11-19>
- National Science Foundation a. *What is interdisciplinary research?* n.d. National Science Foundation. https://www.nsf.gov/od/oia/additional_resources/interdisciplinary_research/definition.jsp.n.d
- National Science Foundation b. *Convergence research at NSF*. n.d. National Science Foundation. <https://www.nsf.gov/od/oia/convergence/index.jsp#:~:text=Convergence%20research%20is%20a%20means,catalyze%20scientific%20discovery%20and%20innovation.n.d>
- Norris, P. E., O'Rourke, M., Mayer, A. S., & Halvorsen, K. E. (2016). Managing the wicked problem of transdisciplinary team formation in socio-ecological systems. *Landscape and Urban Planning*, 154, 115–122. <https://doi.org/10.1016/j.landurbplan.2016.01.008>
- North Carolina State University. (2020, August 31). *The difference between multidisciplinary, interdisciplinary, and convergence research*. NC State University. <https://research.ncsu.edu/rdo/2020/08/the-difference-between-multidisciplinary-interdisciplinary-and-convergence-research/>
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16, 1–13. <https://doi.org/10.1177/1609406917733847>
- Polaris Project (n.d.). National Survivor Study. <https://polarisproject.org/national-survivor-study/>
- Russell, A. (2018). Human trafficking: A research synthesis on human-trafficking literature in academic journals from 2000–2014. *Journal of Human Trafficking*, 4(2), 114–136. <https://doi.org/10.1080/23322705.2017.1292377>
- Saldana, J. (2016). *The coding manual for qualitative researchers*. SAGE Publications.
- Sandwick, T., FineGreeneStoudt, M.A.B., Torree, M., Patel, L., & Torre, M. E. (2018). Promise and provocation: Humble reflections on critical participatory action research for social policy. *Urban Education*, 53(4), 473–502. <https://doi.org/10.1177/0042085918763513>
- Sharkey, T.C., Maass, K.L., Song, Y., Barrick, K., Farrell, A., & Martin, L. (2021). Better together: The need for a transdisciplinary approach for disrupting human trafficking. *ISE Magazine*, 53(11).
- Smith, L. T. (2012). *Decolonizing methodologies: Research and indigenous peoples* (2nd ed.). Palgrave MacMillan.
- Solis, G. (2016). To give and to get: How nurse faculty scholars contribute and benefit from participating in interdisciplinary research teams. *Nursing Forum*, 52(2), 133–137. <https://doi.org/10.1111/nuf.12188>

- Stockols, D. (2006). Toward a science of transdisciplinary action research. *American Journal of Community Psychology*, 38(1-2), 63–77. <https://doi.org/10.1007/s10464-006-9060-5>
- Stringer, Ernest T (2014). *Action research* (4th ed.). Sage.
- Sukach, T., Castañeda, N. G., & Pickens, J. C. (2018). Experiences of female sex trafficking survivors: A phenomenological analysis. *Qualitative Report*, 23(6), 1422–1440. <https://doi.org/10.46743/2160-3715/2018.3242>
- Tebes, J. K., & Thai, N. D. (2018). Interdisciplinary team science and the public: Steps toward a participatory team science. *American Psychological Association*, 73(4), 549–562. <https://doi.org/10.1037/amp0000281>
- Townsend, T., Pisapia, J., & Razzaq, J. (2015). Fostering interdisciplinary research in universities: A case study of leadership, alignment and support. *Studies in Higher Education*, 40(4), 658–675. <https://doi.org/10.1080/03075079.2013.842218>
- Wallerstein, N., Muhammad, M., Sanchez-Youngman, S., Espinoza, P. R., Avila, M., Baker, E., Barnett, S., Belone, L., Golub, M., Lucero, J., Mahdi, I., Noyes, E., Nguyen, T., Roubideaux, Y., Sigo, R., & Duran, B. (2019). Power dynamics in community-based participatory research: A multiple-case study analysis of partnering contexts, histories, and practices. *Health, Education & Behavior*, 46(1S), 19S-32S. <https://doi.org/10.1177/1090198119852998>
- Wallerstein, N., Oetzel, J. G., Sanchez-Youngman, S., Boursaw, B., Dickson, E., Kastelic, S., Koegel, P., Lucero, J. E., Magarati, M., Ortiz, K., Parker, M., Peña, J., Richmond, A., & Duran, B. (2020). Engage for equity: A long-term study of community-based participatory research and community-engaged research practices and outcomes. *Health, Education, & Behavior*, 47(3), 380–390. <https://doi.org/10.1177/1090198119897075>
- Warren, M, R, Calderón, J., Kupscznk, L. A., Squires, G., & Su, C. (2018). Is collaborative, community-engaged scholarship more rigorous than traditional scholarship? On advocacy, bias, and social science research. *Urban Education*, 53(4), 445–472. <https://doi.org/10.1177/0042085918763511>