Trauma-Informed Organizational Coordination in Clinical Computer Security

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This paper investigates how to incorporate trauma-informed principles into organizational and coordination processes in a high-stakes context: computer security clinics for survivors of intimate partner violence (IPV). IPV survivors often face complex technology-facilitated abuse and computer security clinics aim to assist by connecting survivors with trained experts who help them work toward digital safety. We analyze how clinics' referral processes constitute key sites for trauma-informed, inter-organizational coordination work, especially in light of stakeholders' asymmetrical knowledge of technology. Via semi-structured interviews, we uncover the potential for misalignment between survivors' needs and clinics' services, leading to potentially negative consequences for both survivors and clinic staff. We then design new referral and assessment tools that enable trauma-informed care and improve coordination by functioning as a guide for people seeking services and enabling clinic staff to determine if a survivor is a good fit for the services available. Finally, we show how the new tools improve coordination and outcomes by analyzing 97 referrals received by a clinic over a six month period. We close by discussing the role of structured communication mechanisms in trauma-informed inter-organizational coordination in high-stakes contexts.

CCS Concepts: • **Human-centered computing** → *Empirical studies in collaborative and social computing*; **Computer supported cooperative work**; • **Security and privacy** → **Social aspects of security and privacy**.

Additional Key Words and Phrases: technology clinic, technology-facilitated abuse, trauma-informed, coordination, clinical computer security, intimate partner violence, IPV

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1 Introduction

The question of how to effectively coordinate work, reduce friction, and efficiently allocate resources in complex and high-stakes settings is a key interest for the CSCW community [3, 34, 49, 64], spanning contexts such as healthcare [12, 53, 91], emergency response [32], anti-human trafficking efforts [75], and more. In this paper, we examine how to coordinate access to scarce resources in a novel and high-stakes context where services also need to be trauma-informed [26, 60]: computer security clinics (*clinics*, hereafter) for survivors of intimate partner violence (IPV). Research has shown that IPV survivors often face persistent and targeted technology-facilitated abuse, including stalking, surveillance, and harassment [21, 30, 54, 80, 89]. In response, clinics were created to help survivors navigate technology-facilitated abuse and attain digital safety [22, 35, 81, 82].

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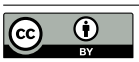

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Clinics exist as one node within a broader ecosystem of survivor support services. Survivors seeking help are referred to the clinic by IPV advocates and caseworkers at partner organizations within this ecosystem. A clinic manager then processes the referral, usually by pairing the survivor with a volunteer technology consultant—an individual with relevant technology background and trained by the clinic—who meets with the survivor to help them navigate technology abuse.

IPV survivors are often exposed to acute and prolonged traumatic experiences, putting them at increased risk of developing traumatic stress reactions, such as anxiety, hypervigilance or, in severe cases, post-traumatic stress disorder [59]. Organizations that work with trauma survivors prioritize trauma-informed care (TIC), an approach to service provision that aims to minimize retraumatization and harm, both for survivors and service providers, who may suffer from secondary exposure to trauma when working with survivors [8, 26]. This includes computer security clinics: clinic protocols were initially developed with TIC in mind [35, 60, 81] and have since been augmented with trauma-informed guidelines specifically tailored to computer security interventions [60]. However, this prior work has predominantly focused on how TIC guides interactions between a technology consultant and survivor during a session. Far less attention has been paid to how TIC might be integrated into organizational practices leading up to the session itself, including referral and assessment processes used by clinics to coordinate requests for service.

Incorporating TIC into clinic coordination processes is critical for two reasons: first, research affirms that TIC needs to be implemented within both interpersonal interactions *and* organizational structures to mitigate re-traumatization [26]. As the survivor's introduction to the clinic, coordination processes set the tone for the service to develop rapport and build trust. This is especially important for clinics, as IPV survivors often report negative experiences when seeking help for technology abuse via traditional services (e.g., law enforcement) [21, 23, 89]. Second, coordination processes play a pivotal role in assessing the clinic's ability to fulfill survivors' specific requests for support. This is important as IPV survivors may have uncommon or urgent requests that require additional preparation by the consultant, or the survivor's concerns may be better supported by another professional service (e.g. legal or mental health services) [60].

As survivors are referred to clinics by IPV advocates and caseworkers, robust inter-organizational coordination assists in achieving two related goals for providing TIC: (1) clinics embed trauma-informed practices during the process of receiving, reviewing, and assessing service requests from survivors, and (2) the resources provided by the clinic to fulfill requests are safe, transparent, and meaningful to the survivor. This paper details a multi-phase study towards these goals.

First, we conducted interviews with 16 participants from three clinics (Section 3). We uncover challenges with current referral and assessment tools, identifying that a lack of fit between the survivor's digital safety goals and the clinic's services is directly tied to negative consequences that may exacerbate traumatic stress for all stakeholders. Based on these findings, we convened an expert panel to design new referral and assessment tools (Section 4) that aim to improve inter-organizational coordination, centering trauma-informed principles of safety, trust, and care [16, 20]. Via carefully structured questions on a standardized referral form which are supplemented with an open-ended, goal-setting conversation, the redesigned process enables clinic managers to work cooperatively with survivors and advocates to determine if the clinic can safely help the survivor achieve their goals. We then integrated the new tools into a clinic's ongoing operations; data from 97 referrals over a six month period (Section 5), shows that the new tools effectively enable clinic managers to determine if referred clients are likely to be a good fit for the clinic's service.

Finally, we discuss the benefits of improved inter-organizational coordination for key stakeholders, including how the new tools enable a referral process that is aligned with TIC best practices, benefiting both survivors seeking support [16, 20, 26] and consultants who are exposed to vicarious

trauma through their work with survivors [8, 37]. In contrast to prior work that calls for coordination mechanisms with greater flexibility [14, 17], we demonstrate that in this context, structured communication mechanisms help ensure that survivors who discuss traumatic experiences do so with a provider who is qualified to respond.

In sum, we contribute the end-to-end design and deployment of trauma-informed, inter-organizational coordination mechanisms in a real-world setting: computer security clinic for IPV survivors. In doing so, we expand the CSCW community's knowledge of how to incorporate trauma-informed principles into the design of organizational and coordination structures in high-stakes contexts.

Researcher positionality. Our paper utilizes a reflective and reflexive approach [66, 72] that draws on the authors' close knowledge of clinic management and referral processes. All authors have extensive experience both as researchers studying digital safety and as practitioners administering technology abuse services to survivors. Some of those experiences are represented in the data. These direct and collective experiences enable the research team to understand the unique logistics and pitfalls of coordinating public services, the realities of which are often inscrutable or abstruse to those without such lived experience; our reflexive approach enables a richer understanding of the involved processes, grounded in the realistic stakes for survivors and organizations.

2 Background and Related Work

2.1 Coordination and Resource Allocation in High Stakes Settings

The CSCW community has a long-standing interest in supporting coordination and reducing friction in complex and high-stakes workflows [3, 34, 49, 64]. Much of this literature focuses on healthcare contexts, including coordination among formal and informal caregivers [5, 13, 15, 76] and clinical care teams [1, 65, 74]. For example, research has studied how hospital teams use whiteboards and shared displays to distribute information across teams [12]. Other work examined coordination in an emergency communication center, where collocated specialists coordinate activities relevant to pre-hospital patient care and transportation [91]. Moreover, with the growing adoption of clinical decision support tools, research has studied, for example, the design of hospital alerts as coordination mechanisms to support decision making [53].

However, much of this literature examines *intra*-organizational coordination within a single organization (e.g., hospital). By contrast, work exploring *inter*-organizational coordination across multiple organizations is relatively scarce. A notable example is the Care Hotel [14] which explored ways for actors from various organizational settings to provide rehabilitative services to older adults transitioning from hospital care to home care. The study's findings suggest that successful coordination in this setting requires a shared communication platform that is flexible enough to support both standardized and ad-hoc coordination processes [14].

Beyond healthcare, a handful of studies have explored inter-organizational coordination in other high-stakes domains. Goggins et al. [32] examine how organizations coordinate emergency earthquake response efforts via online resource coordination (i.e., discussion forums). Ecker et al. [25] analyze coordinated access and entry systems that assess the needs of people experiencing homelessness and match them with scarce housing resources. Stoll et al. [75] reflect on coordination among nonprofit organizations engaged in anti-human trafficking work, uncovering challenges that complicate inter-organizational coordination that are also relevant to our context, including asymmetrical access to and knowledge of technology, reliance on volunteer workforces, and high rates of staff turnover at nonprofit organizations.

Research has also studied service provision and resource allocation in high stakes contexts [6, 11, 18, 33, 70]. For example, dynamic resource allocation tools are used in refugee resettlement to help social workers place refugees in ways that maximize potential employment [4]. In child

welfare, social workers use decision support tools that calculate the risk of child maltreatment [44, 62, 63]. Findings from this research uncover misalignment between algorithmic predictions and stakeholders' decision-making objectives [44], highlighting the need for decision-support tools that augment human discretion rather than focusing on deterministic scoring [6, 62].

We contribute to this literature by examining how to coordinate access to scarce resources in a novel and high-stakes context where services also need to be trauma-informed: computer security clinics for IPV survivors. We investigate how clinics' referral and assessment processes, as examples of coordination mechanisms [64], constitute key sites for inter-organizational coordination work to ensure that (1) survivors referred to clinics by partners may benefit from the services available, and (2) clinic staff may distribute their limited resources in ways that effectively accomplish their mission. We now discuss relevant literature on delivering trauma-informed services.

2.2 Trauma Informed Care

Our study takes place in a high stakes context where services need to be trauma informed. Trauma is the physical, emotional, and/or psychological harm caused by experiencing or witnessing a deeply distressing event, such as a natural disaster, physical abuse, or death of a loved one [2]. Literature has established that most people are likely to experience a traumatic event in their lifetime [24, 57] and that such events can have lasting adverse impacts on a person's mental, physical, social, and/or spiritual well-being [59]. In addition, prolonged or frequent exposure to traumatic events may increase a person's risk of experiencing short-term (e.g. anxiety, hypervigilance) and long-term (e.g. post-traumatic stress disorder) traumatic stress reactions [2].

People who work with trauma survivors are also at risk of experiencing 'secondary' or 'vicarious' trauma [28, 46], which may have detrimental effects on their emotional well-being as they listen to, validate, and empathetically support trauma survivors. Vicarious trauma is distinct from burnout, characterized by exposure to clients' suffering, rapid onset, and feelings of helplessness and confusion [39]. The adverse effects of vicarious trauma are cumulative when people work with survivors over long periods of time [58]. Prior work has examined factors that influence the manner and degree to which direct service providers are vulnerable to vicarious trauma [37], such as the provider's level of awareness of the traumatic event and how empowered they feel to respond. Notably, providers who are exposed to others' trauma and who lack the capacity to respond may face higher risks of vicarious trauma [84, 85].

Recognizing the prevalence of trauma, mental health professionals have created evidence-based guidelines for incorporating TIC into a diversity of service sectors [2], with many organizations integrating TIC practices into their work structures. While these may be tailored to specific populations, a general trauma-informed approach includes recognizing the prevalence and impacts of trauma and potential for vicarious trauma, and designing practices and protocols that minimize the potential for harm [26, 27]. This includes ensuring that providers have training that reinforces the importance of active listening, empathy, and validation, all of which ensure that clients feel believed and help providers build trust and rapport [71, 87].

Yet, a holistic trauma-informed approach necessitates attention beyond provider-client interactions. It also requires embedding TIC into organizational structures to ensure that no aspect of the service is reactivating, emotionally unsafe, or disempowering for survivors [10, 26]. Notably, prior work reinforces "screening and assessment" and "resource coordination and advocacy" as central areas within an organization's structure for trauma-informed principles [26, 40] .

Referral and assessment mechanisms that incorporate TIC are attentive to the emotional impact of answering questions about trauma and only ask need-to-know-information required to determine fit between a client's need and the services offered [26, 50]. For example, referral forms with closed-ended questions may minimize the amount of information a client may feel compelled to provide,

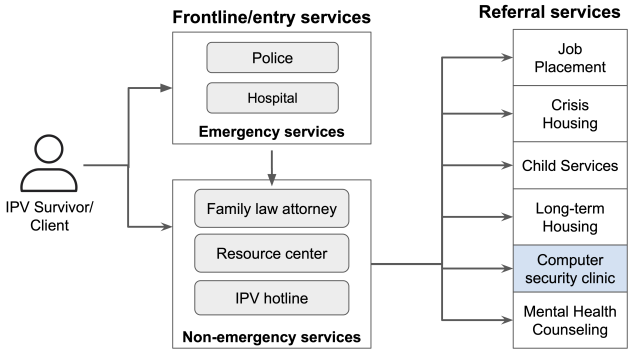

Fig. 1. Ecosystem of services available for IPV survivors showing frontline/entry services that coordinate access to services that require referrals. The computer security clinic is highlighted in blue.

whereas open-ended questions requiring narrative responses can activate traumatic stress reactions as clients must recall details of past experiences [50, 67].

Embedding TIC into case management processes is also important for survivors [40]. For example, with the client's consent, protocols can enable different service providers to follow up with one another to clarify information and determine fit before a client appointment is scheduled [40, 50]. This inter-agency coordination minimizes how often a survivor needs to retell their trauma history and ensures the agency is able to meet the client's needs [67]. Trauma-informed organizational structures also help to reduce vicarious trauma: service providers are more likely to encounter clients with clear and specific requests for help that the provider is trained to address [26, 86]. Building on this literature, our study explores how to incorporate TIC principles into clinics' organizational structures. We now provide background on computer security clinics.

2.3 Background: Clinical Computer Security Interventions

Our study focuses on clinics that provide assistance to IPV survivors who face complex, persistent, and targeted attacks on their digital devices and accounts. Prior research has shown how IPV survivors frequently experience technology-facilitated stalking, surveillance, and harassment by an abusive partner [21, 30, 80, 89]. In response, clinical computer security interventions have emerged as a form of harm mitigation [22, 35, 81, 82], with several clinics offering services around the US, including in New York, NY; Madison, WI; and Seattle, WA.

Clinics operate within a broader ecosystem of support services. Clinics are one node in a constellation of diverse services that collectively support survivors' varied needs (see Figure 1) [29, 31]. In this ecosystem, frontline service providers act as centralized hubs for survivors seeking services (*clients*). In these hubs, advocates meet with clients to understand their needs and make referrals to specialized services based on the client's concerns (see Figure 1).

Clinics are designed to fit within this broader ecosystem of support services: clients who need assistance with technology-facilitated abuse are referred to a clinic by advocates working at partner organizations [22, 29, 35]. This arrangement is both deliberate and practical. A single organization would require significant resources to respond to every one of a client's needs, and many services require specialized training. Computer security clinics, for example, are not equipped to assess a client's risk of violence or help a client file a restraining order. Functioning as a partner organization allows specialized services like computer security clinics to concentrate their often limited resources on specific tasks without also needing to provide more general (and essential) services. While this

structure prevents service redundancy, it also introduces coordination complexities as it requires stewarding the clinic's available resources in conjunction with partners.

Partner organizations struggle to assess clients' technology needs. IPV advocates at partner organizations are responsible for identifying a client's concerns and choosing whether to make a referral. As such, partner organizations play a key role in determining which clients may access the clinics' resources. Typically, advocates assess a client's needs during a comprehensive conversation covering a wide-ranging set of topics, technology being only one need among many others that advocates must discuss in a time-constrained setting. Moreover, professional standards for IPV advocates do not always require training on technology abuse, with prior research finding that advocates often self-report low confidence in their ability to manage clients' technology concerns [30, 31].

These factors can make accurately assessing a client's technology concerns prohibitively challenging for advocates. Clinics can, and often do, offer training to advocates to help mitigate these issues; however, training frequency must contend with notoriously high turnover and burnout rates experienced by advocates [7, 46, 52, 88] and the rapidly evolving nature of technology abuse. Consequently, many advocates, upon discovering that a client has technology concerns, may assume that it is better to refer the client to the clinic rather than risk denying them a needed service.

Clinics coordinate access to their scarce resources. As shown in Figure 2, advocates refer clients to clinics by filling out an online referral form, providing details about the client's situation needed for the clinic to deliver service, including safe ways to contact the client [81]. Clinic managers are notified (e.g., via email) when a new referral is received and assess the provided information to determine the client's specific needs, such as the types of devices or days the client is available to meet. Clinic managers then pair the client with a volunteer technology consultant—individuals who have pertinent technology background and have been trained by the clinic, including training in TIC. The consultant, supported by a clinic manager, schedules one or more meetings with the client to help them navigate their technology concerns [82].

As relatively new services requiring skilled staff, clinics have limited capacity and the demand for services typically exceeds available resources. Thus, clinics face a crucial challenge: how to allocate their limited resources to survivors who are most likely to benefit. Prior to this study, most clinics employed a variation of a first-come, first-served model, with clients allocated to available consultants in the order referrals were received, and clinics maintaining a wait list when they reached maximum capacity. Although this model is relatively fair and avoids the potential for bias or discrimination by clinic managers, it can also lead to problems (discussed in Section 3.2); prior work has, for example, demonstrated the challenges that arise when consultants meet with clients whose concerns cannot be addressed by the clinic's available services [60].

Thus, clinics need improved coordination mechanisms that simultaneously: (1) guide non-technology IPV advocates to make judicious client referrals, and (2) enable clinic managers to assess if a referred client would benefit from the services available. In the rest of this paper, we first shed light on the challenges and pitfalls of current clinic referral and coordination processes (Section 3). We then detail the design of improved coordination mechanisms (Section 4) and evaluate their impact after being launched in a real clinic setting (Section 5).

3 Investigating Current Referral and Assessment Processes

Our study investigates how to incorporate TIC principles into clinics' organizational and coordination processes. First, as described in this section, we conducted semi-structured interviews with personnel from three clinics to investigate their current coordination processes to understand challenges and opportunities for improvement. All procedures were IRB approved.

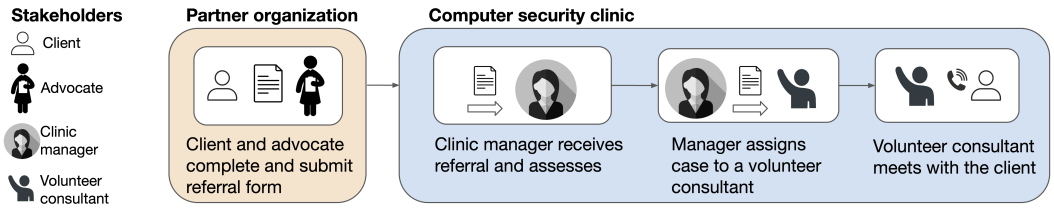

Fig. 2. Computer security clinic referral process prior to this study.

3.1 Methodology

Recruitment and Participants. We recruited 11 technology consultants (labeled C1-C11) and five managers (labeled M1-M5) from three clinics in Seattle, WA; Madison, WI:, and New York, NY. We reached out to professional contacts at each clinic via email, informing them of the study and asking if they would aid in recruitment; contacts at all clinics agreed. Consultants were eligible if they had participated in two or more client sessions in the past six months, with managers at each clinic helping determine eligibility. Eligible consultants were contacted by either the first or last author and invited to participate. Consultants were informed that declining would not impact their relationship with the clinic or its partners. For all clinics, we recruited at least half of the consultants on staff, with two clinics having fewer than five eligible consultants at the time of our study. Participants possessed an average of 3 years of experience at their respective clinics. Since each clinic had fewer staff in management roles, typically 1-2 per clinic, we interviewed all clinic managers who were available and consented to participate. No compensation was offered for participation. All interviews occurred in early 2023.

Interview procedure. Interviews were conducted via Zoom in one-on-one sessions lasting approximately 60 minutes. Interview questions for both consultants and managers explored instances where they encountered clients who sought services that the clinic did not have the capacity to provide, including signs that clinic staff associated with service misalignment, and how those situations typically resolved. For clinic managers, additional questions focused on structural aspects of the clinic, including the relationship between the clinic and referring partner organizations.

Data Analysis. Interviews were audio recorded (with participant consent), transcribed using a professional service, and anonymized by the interviewer before analysis. The first and last authors (*the coders*) then collaboratively coded the interviews using an inductive process as outlined in Thomas [77]. The coders first independently identified responses within the interviews relevant to the research objectives, e.g. *common cues indicating service misalignment*, then reconciled identified segments. The coders then iteratively worked to identify commonalities and oppositions within and across segments, condensing them into themes [77]. Three primary themes resulted from this analysis relating to challenges coordinating clinic referrals, centering around (1) the nature of misaligned referrals, (2) limitations of the referral process, and (3) the consequences of misaligned referrals. The findings discussed below follow this same structure.

3.2 Findings

We organize our findings into three salient themes relevant to clinic coordination processes. First, all clinic personnel reported receiving referrals for clients whose needs were not an appropriate fit for the clinic's services, with such cases often sharing common elements. Second, existing referral processes between clinics and partner agencies had limited efficacy for coordinating around such

cases. Finally, when consultants did meet with clients whose concerns were not a good fit for the clinic, outcomes indicated potentially negative manifestations of traumatic stress.

3.2.1 Misalignment between a client's concerns and the clinic's remit. Participants identified three types of concerns that indicated a discrepancy between a client's needs and the services offered by the clinics: concerns that were out-of-scope, implausible, or non-specific.

Out-of-scope requests. One of the most frequently cited issues was clients who wanted services that the clinic cannot provide. Clinics offer limited services, circumscribed by, for example, areas of expertise, resource constraints, or legal liabilities. When meeting clients whose concerns fall outside this remit, clinics often expend significant resources communicating these limitations.

For example, a clinic whose staff can only support remote consultations often receives clients seeking in-person services, leading to *"just a lot of coordination logistics, if [clients] don't feel safe having the call in their home"* [M2]. Another consultant recalled a client seeking help for image-based sexual abuse (IBSA) which *"wasn't something we could really do much about"* [C7]. Although IBSA is a psychologically devastating form of technology abuse, most available forms of redress are in the realm of legal services, and clinics thus redirect such clients to a legal advocate. Even when concerns are within the clinic's remit, clients sometimes have requests that require specialized expertise or additional research by the consultant, such as concerns about *"a smart device that we really don't know how to handle that they did not mention on the referral form"* [M4].

Consultants often do not learn the specific services a client is requesting until the appointment is underway. Once uncovered, consultants clarify which services they can provide, but have usually committed to a full appointment, saying *"once it's gotten past screening, I'm not gonna say I can't help you until they acknowledge that I can't do anything"* [C11]. Another consultant added, telling a client that *"we cannot actually help them with [something], I find that very hard"* [M5]. Waiting until an appointment to uncover this mismatch, however, is not just upsetting for consultants; as discussed in Section 4.1, it can activate traumatic stress reactions and re-traumatize clients.

Implausible tech concerns. Another theme involved clients whose concerns are not based in plausible technical realities. This generally fell into two categories. In the first, the client is concerned that a known abusive individual is behind benign technical occurrences such as dropped calls or slow connections, phenomena that were indicative of *"this idea that there are omnipotent parts of technology that will continue spying on you no matter what you do"* [C4]. Such beliefs are often rooted in hypervigilance, a well-documented coping mechanism resulting from the sustained, traumatic abuse that many survivors experience [36, 47]. While these concerns may be addressed by clinics, consultants agreed that such cases tend to be complex: they often involve a larger number and variety of devices and accounts, require significantly more emotional support, and take longer. For these reasons, consultants want *"a better way to sort of filter folks to the appropriate specialist"* [C10] allowing them to better prepare for client appointments.

In the second category, clients are concerned about entities that have *"very strong technical prowess"* [C9], such as access to tools only available to militarized organizations (e.g., *"NSA-level spying"* [C4]). One frequent indicator cited by participants for these types of cases is the identity of the entity causing harm. While some clients believe that the harming entity is a former intimate partner, others cite an unknown adversary, multiple adversaries (such as gangs), the government, or a *"network of saboteurs"* [M2]. The latter dynamic is a touchstone for conspiratorial beliefs, with one manager stating that when assessing potential clients, they explicitly look *"for multiple people accessing their devices, for the gang-stalking language"* [M3]. These situations reflect how a mismatch in service can both heighten traumatic stress for clients and consultants. In such cases, consultants explained that they do not have the tools or training to distinguish between these

scenarios or otherwise safely serve these clients: *"I certainly don't want to pathologize anyone, but when people perceive that multiple people are stalking or following them, it's very, very difficult to be able to calm a client down, or to explain the possibility of these kinds of things happening"* [C6].

Non-specific tech concerns. On occasion, clients arrive to appointments with nonspecific concerns or general questions about technology abuse, indicating interest in an exploratory appointment. In these instances, the information provided on the referral form is often vague, e.g. "the client is worried about her technology". The consultant then spends a significant portion of the appointment ascertaining whether the client has a specific technology concern. In many cases, the client identifies their abuser as working in the tech industry or says that the abuser brags about their technical prowess, leading the client to fear the abuser's amorphous and seemingly unlimited technology capabilities. A consultant explained:

> *"Often, [clients] will come in and say 'my ex works in technology', which is surprisingly common, and they will be like, 'I want to know if this person is hacking my phone, I'm really scared, they've been telling me all these things.' And then they bring in a bunch of different devices that aren't even possible to be hacked like that."* [C8]

In other cases, it may be that the clinic was offered to the client as one of a standard slate of resources, absent any specific indications of technology abuse. The client then worries about vague forms of technology abuse that could be occurring without their knowledge, a worry that may be exacerbated by their history of abuse and a cultural fear of technology. While consultants added that exploratory appointments can offer some clients emotional relief or information about what is and is not technically feasible, these kinds of appointments may deplete a finite resource that would otherwise be allocated to clients facing concrete and urgent forms of technology abuse.

3.2.2 Limitations with current clinic referral processes. Coordination throughout the referral process is key to mitigating re-traumatization for clients and sustainable usage of the clinic's resources, and partner agencies provide a valuable service in helping manage clinic resources. All clinics used a referral process comparable to the one described in Figure 2. A clinic manager recalled moving from a self-referral model to one in which only partner agencies could refer, observing that since the change, *"we definitely have gotten more [clients] that are a good fit for our services"* [M3]. Nonetheless, participants identified room for improvement.

First, clinics struggle to maintain a baseline understanding of the scope of their services among partner agencies due to high staff turnover [55]. Although clinics regularly engage in efforts to communicate the remit of the clinic (e.g., via trainings and informational flyers), these efforts may be for naught when, as one manager lamented, *"3 to 6 months later, it's an entirely different set of staff"* [M1]. This work must also be repeated when new partner agencies enter or exit the ecosystem, as one clinic learned, admitting they were *"working on setting boundaries"* [C9] after the new partner kept referring clients who wanted services they couldn't provide.

Second, in the referral ecosystem outlined in Section 2.3, advocates at partner agencies whose primary role is to make referrals to specialized services may not have the time or training to explore the nuances of the client's needs, especially if the concerns are beyond the advocate's own expertise or comfort. As one manager explained, advocates saw their role as providing resources, "*so if a [client] starts talking about technology, they'll be like, 'great, let's refer you to the tech clinic.'*"

However, given additional information about the client's concerns, advocates could realize that the referral may be unnecessary; one clinic manager recalled an advocate who accompanied a client to their appointment, only to declare, upon fully understanding the client's concerns, *"Oh, I could have done that!"* [M4]. Even when advocates try to delve into client's specific technology needs, the nuances of the client's concerns might elude them. As a consultant pointed out, understanding a

client's technology concerns can be difficult even for consultants who are specialists, so it made sense that advocates might have difficulty "*determining what is reasonable*" [C10].

Even if explicitly aware that a request might be outside the clinic's remit, advocates are inclined to view erroneously offering access to the clinic's resources as a safer option than erroneously denying them. One manager recalled an advocate explaining why they referred a client who was not a good fit for the clinic, stating "*I thought it would be better to offer the resources than withhold [them] but I'm not surprised that this is happening*" [M1]. Though motivated by a desire to exhaust all avenues to help the client, these good intentions are often misguided, potentially exacerbating traumatic stress for the client and consultant, as we describe next.

3.2.3 Negative outcomes. Trying to help a client whose needs are misaligned with the clinic's services may incur unintended negative consequences. For clients, (re)telling details of their abuse can be re-traumatizing [41]; being turned away after sharing these experiences can, in itself, create new traumatic experiences [61, 90]. In extreme cases, clients who are experiencing significant difficulty with reality testing or paranoia may have their symptoms exacerbated by inappropriate services [56]. M1 recalls an incident in which a referring partner contacted the clinic to ask them to cease services with a referred client: observing that the client was navigating severe mental health challenges, they feared that exploratory technology services were detrimental to the client's well-being and escalating their paranoia.

In addition to poor client outcomes, such appointments represent inefficient use of a limited resource. Clinics often have only a small number of appointments available, after which additional requests are waitlisted. This means that when appointments are spent uncovering mismatched needs, they come at the cost of a waiting client with possibly more urgent needs. Additionally, when appointments are not immediately available for clients who have urgent needs, referring agencies can become frustrated. Participants suggested that an assessment tool *"could help us a lot in terms of resource allocation"* [M1]; another participant agreed, imagining *"a more straightforward portal . . . where we know how to assign [clients]"* [C10].

Participants reported that misaligned cases impacted consultants' satisfaction with their role and personal well-being. When consultants met with clients whose needs were more suited to mental health or counseling experts, they often felt guilt, sadness, and frustration that an appointment was ineffectual. One consultant remembered a client *"describing some really difficult mental health challenges...that was a difficult case to go through"* [C5]. Another consultant recalled working with a client who asked for services outside the clinic's remit; wanting to help, the consultant tried to research the client's issues, but later reflected *"maybe that was not a good idea"* [C9].

As one manager observed, consultants struggled with guilt *"when they feel they have not been able to help a client or they are struggling to manage the appointment well"* [M2]. These feelings of guilt, stress, and inadequacy increase the risk of burnout and vicarious trauma [8, 45] for consultants, a concern for both the well-being of the consultant and the sustainability of clinics: since consultants are often volunteers, clinics rely on keeping volunteers engaged in meaningful work.

4 Developing New Referral and Assessment Processes

Our findings from Section 3 highlight challenges and limitations with current processes used to coordinate access to computer security clinics, including the potential for misalignment between survivors' needs and the services offered, with potentially negative unintended consequences for stakeholders. However, our findings also suggest that the clinics' referral processes may constitute key sites at which clinic managers could proactively assess a referred client's fit with the services available and, if needed, communicate with clients and referring advocates to ensure the client might benefit from the clinic's services (see Figure 3).

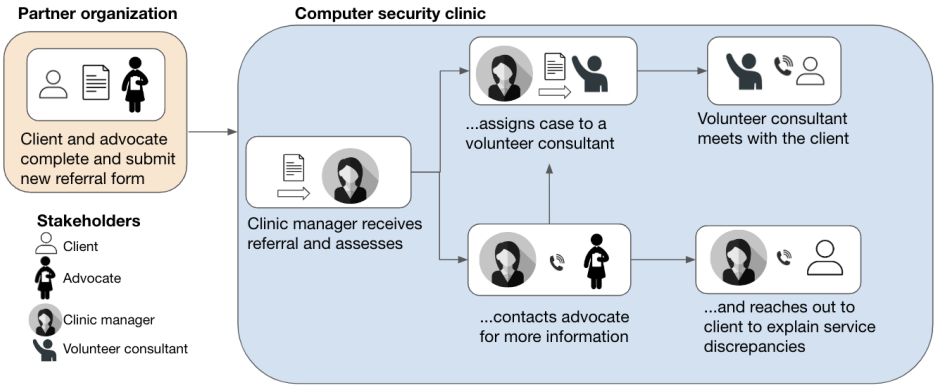

Fig. 3. New clinic referral and assessment processes.

Towards designing such improved referral and assessment processes, we drew on literature documenting similar efforts to coordinate access to limited resources. A common goal in this prior work is to develop fair processes for distributing resources in circumstances where demand exceeds supply. Examples include processes for distributing housing vouchers and services [78], accessing legal advocacy services [83], and conducting lethality risk assessments to determine allocation of police resources and referrals [73]. In line with the strategies used in these works, we used an iterative design process that engaged with professional support workers with expertise working with survivors, including referring survivors to specialized resources.

4.1 Designing New Referral and Assessment Processes

4.1.1 Methodology. First, we convened a six-person panel comprised of personnel from three clinics: three advocates with experience referring clients to clinics, two clinic managers and one professional with experience with both roles. To find participants with the experience, willingness, and capacity to commit to this panel, we drew on our professional networks, ensuring that both non-technical advocates and clinic managers were represented. The panel's tasks were threefold: (1) to design an amended referral process that aligned with trauma-informed care practices; (2) to define relevant criteria for evaluating and assessing service requests; and (3) to suggest a set of questions that could elicit necessary information about an incoming client's circumstances while minimizing risk of retraumatization. As such, the panel required both an intimate understanding of existing referral processes and the ability to regularly attend weekly, hour-long intensive focus groups held over Zoom during the course of six weeks in the fall of 2023. Focus groups were not recorded, but the first and last authors took detailed notes from each session.

In the initial convening, panelists were briefed on the findings from the first study; as all panelists had significant experiences working with clinics, the panelists affirmed that the findings were reflective of their own experiences. In particular, panelists honed in on a need for more granularity in the nature of a client's technology concerns, common cues that may indicate misalignment between client's needs and clinic resources, and generalizable patterns in the communication between clinics and partner organizations. In ensuing meetings, panelists drew on these findings and their own experiences when approaching the three objectives outlined above.

4.1.2 Redesigning referral processes. Tasked with redesigning clinic referral processes, the panel drew on their collective knowledge of referral ecosystems, clinic management, and trauma-informed practices. When considering the limitations highlighted in Section 3.2, clinic managers felt that

they would be best positioned to assess whether a client's needs were a good fit for the clinic's services, but would need a few key pieces of information to do so. However, this information is often not included in the current referral form.

First, panelists discussed how, even though they may know additional details about the client's situation, to protect the client's privacy, they only share the minimum amount of information necessary for a client to request a service. Moreover, some information is too sensitive to be recorded on a referral form, such as an advocate's opinions about a client's mental health. Prior work supports the idea that advocates have rich insights into survivor's experiences, but may not document those insights unless necessary [79, 82]. Second, panelists affirmed that the 'knowledge gap' identified in the first study meant that, until they had significant exposure to the clinic's services, they had limited insight into what would be relevant or helpful for the clinic to know. As such, advocates typically only share exactly the information requested by the referral form and do not embellish their request with additional details.

These insights led the panelists to propose changes to existing referral processes. As a start, proposed workflow changes centered on *clinic managers*: instead of simply allocating referrals to volunteer consultants on a first-come first-served basis (Figure 2), clinic managers could use information provided in the referral form to assess the client's needs and likely fit with the services available. As part of this process, clinic managers may coordinate with referring advocates or clients, via emails or brief phone calls, to clarify requests (see Figure 3). This assessment was formalized into a second step in the coordination process, in which clinic managers call advocates or clients to learn information that might be helpful for the clinic but too sensitive to disclose in a form.

The panel thus proposed restructuring the referral form in ways that clearly communicate the services available and guide referring advocates to provide information needed for clinic managers to assess the client's situation. As such, advocates' and clients' work processes remained largely the same: they still completed a referral form, but the questions on the form changed. In particular, the panel constructed *structured* questions (see Table 1) that encouraged communication of key pieces of information that enable assessment of the client's situation. For example, instead of an open-ended question such as *What are your technology concerns?* the form instead provides a menu of available services for advocates to select from, with an "other" option. In this way, if the client's requests significantly deviate from the structure of the form, it is a hint to the advocate, client, and clinic manager that the clinic may not be the right service; it also signals to the clinic manager that a conversation to assess fit might be needed. Similarly, advocates might not realize that an abusive person's stalking behavior is relevant to disclose unless it is explicitly asked on the referral form.

In constructing the new referral processes, panelists paid careful attention to incorporating trauma-informed best practices. For example, structuring the questions on the referral form in ways that enable clients to simply answer 'yes', 'no', 'other/not sure' to a question allowed clinic managers to identify situations that were complex or ambiguous that would benefit from additional clarification in a phone call, but spared survivors the need to recount those details to the advocate or to record confidential or sensitive information in the form. Moreover, the form only asked questions that were relevant to and within the clinic's expertise to evaluate, avoiding questions that unnecessarily elicited details about their trauma history. We next provide additional detail on how panelists decided if a question was 'unnecessary' or not.

4.1.3 Synthesizing assessment criteria and structuring questions. The panel synthesized three key criteria that might enable clinic managers to assess a client's likelihood of benefiting from the clinic's services, which then informed the questions included in the referral form. As we discuss below, TIC principles guided the structure of each question. Specifically, all but the final question are closed-ended and only inquire about tech-specific information to help the clinic better understand

ID	Question	Structure	Criteria		
			Fit	Complexity	Urgency
A1	Are you seeking help for technology issues related to IPV?	Yes/No	●		
A2	Which tasks would you like help with?	Multi-select	●	●	
A3	Which devices or accounts would you like help securing?	Multi-select		●	
A4	Are you okay with receiving services over the phone?	Yes/No	●	●	
B1	Do you currently share a phone plan with the PCH?	Yes/No	●	●	●
B2	Does the PCH seem to read your emails or texts?	Yes/No/Unsure	●	●	●
B3	Has the PCH known your location when they shouldn't?	Yes/No/Unsure	●	●	●
B4	Which statement best describes the PCH's tech knowledge?	Select one		●	
B5	Has the PCH been able to physically hold your devices?	Yes/No/Unsure		●	
C1	Which statement best describes your living situation?	Select one	●	●	
C2	Do you share custody of children with the PCH?	Yes/No	●	●	
C3	Do you need help before an important upcoming date?	Yes/No			●
C4	How would you describe your level of safety?	Multi-select			●
C5	Is there anything you'd like us to prioritize or know?	Free response	●	●	●

Table 1. Final version of the structured questions on the new referral instrument and the corresponding assessment criteria. The person causing harm is abbreviated in the table as PCH. A more complete version with answer options is available in Table 4 in Appendix A.

the client's safety concerns and whether those concerns can be met by the clinic. Conscious of the need to minimize the length of the referral form for advocates and clients, the panel suggested that questions only be included if they clearly informed one or more of the three criteria:

Fit: Are the clinic's available services likely to be able to address the client's concerns? Questions relevant to this criterion aimed to address limitations surfaced in Section 3.2, such as, for example, situations where the person/party causing harm is not an intimate partner (question A1 in Table 1), other out of scope requests (question A2), or clients who were not comfortable with the remote nature of the clinic's services (question A4). The closed-ended structure of these questions limit the amount of additional trauma history that a client might otherwise feel compelled to include. Frequently, questions are structured in ways that may make it easy for clinic managers to identify likely discrepancies; for example, clients who have non-specific tech concerns may simply select all (or none) of the available services listed (question A2), which may help the clinic manager flag that the client may not be a fit for the clinic.

Complexity: What resources or preparation would a consultant need to be adequately prepared to address the client's concerns? Questions relevant to this criterion aim to yield an understanding of client's sociotechnical situation including, for example, if they still reside with the abusive partner (question C1), if the abusive partner had physical access to their devices (question B5), or if they share custody of children (question C2). This information may help the clinic manager assign the case to an appropriate consultant, reducing the potential for vicarious trauma by ensuring that consultants are more likely to meet with clients that they can help. [58]

Urgency: Are there urgent or time-sensitive circumstances that warrant prioritization? Relevant questions aimed to identify, for example, upcoming dates of court cases or housing allocations (question C3) or immediate safety concerns (question C4) that the clinic could use to prioritize the client's case. These questions reflect the TIC principle of *empowerment*, encouraging clients to self-assess factors contributing to their personal risk.

Question organization. Beyond ensuring that all questions were guided by TIC principles and informed one or more of the key criteria, the panel proposed further structuring the form in ways that yield relevant information regarding the specific services offered (questions A1–A4), the technology-related behaviors of the person causing harm (questions B1–B5), and the client's individual circumstances and understanding of their own situation (questions C1–C5).

As shown in Table 1, questions A1–A4 relate to the service itself, such as service modality (remote or in-person) and the specific services sought by the client that are offered by the clinic (e.g. the number and type of devices that the client wanted examined). Where a menu is provided, the panel made the intentional choice to only include options available at the clinic, but allowed the user to select "other" and fill in a custom service (see Appendix A for response options).

The second block of questions, B1–B5, pertain to the technology-related behavior of the person causing harm, such as if they touched or held devices, had a history of stalking, or seemed to know the content of electronic communications. When constructing these items, the panel drew on literature on trauma-informed care that offered guidance on navigating trauma-histories during the early stage of provider-client relationships [50]. For example, they were careful to avoid especially sensitive questions (e.g., about physical violence) or questions that required technical knowledge to answer (e.g., about spyware). Instead, items were limited to types of information a typical survivor would know and would have shared or discussed with an advocate. Many questions include an option to select "unsure" or "other" if the client feels the options do not represent their lived experience. Aware that abusive partners often overstate their abilities [22], responses for item B4, which asks the client about the harming party's technical skill level, are designed to minimize subjectivity via options that speak to professional or formal training.

The last block of questions, C1-C4 center on the individual's circumstances and understanding of their own situation. Advocates in the panel suggested that, since clients are working with a trained advocate who have likely already assessed risk, one option for gauging urgency with respect to potential harm is to simply ask clients to self-identify their own sense of safety, e.g., was the client concerned for their physical safety, ability to earn a living, and/or emotional well-being? Finally, to balance the highly-structured nature of the form, this is the only section to include a free-response option for the client to provide any other important information they might want to share.

4.2 Vetting the New Referral Form

After designing new workflows and structured assessment materials for the clinic referral process, the panel next solicited feedback from referring advocates. The primary goal was to ensure that the new referral form was comprehensible, appropriate, and manageable for advocates who would use the form when making client referrals.

Methodology. We created a prototype referral form in Qualtrics and used it to solicit feedback from advocates with experience referring clients to clinics. To recruit advocates, we sent emails to listservs at partner organizations for the three clinics from the first study; two organizations responded. The recruitment email explained that participation was not mandatory and would not affect the advocates' or organizations' relationship with or access to the clinics. Participants were offered a $25 gift card for participation. In total, we held three feedback sessions with seven advocates (in twos and threes), and a fourth feedback session with the head of one partner agency to approve roll out of the new processes in one of the clinics. All sessions were held in late 2023.

A member of the research team facilitated the feedback sessions over Zoom. At the beginning of the session, participants were given a link where they could access a trial version of the referral form. The facilitator then used Zoom's screen sharing capability to display the form, walking advocates

through each question and eliciting their opinions and feedback. The facilitated conversation focused on the wording of questions, the potential imposed burdens for advocates and clients, and factors that were either unnecessary or missing. If all participants consented to recording, the sessions were recorded and auto-transcribed using Zoom's built-in functionality. Otherwise, the facilitator took detailed notes. Feedback from the sessions was successively incorporated into the prototype to minimize repetitive comments from subsequent feedback sessions.

Feedback and iteration. Advocates were excited about the potential to improve the coordination between clinics and other services, sometimes also sharing frustrations with existing processes. For instance, advocates voiced that it was challenging to understand what services were available at the clinic, perceiving that the structure of the new referral form provided much needed clarity. Suggestions we received from advocates focused on terminology used in the questions; advocates noted that certain terminology might be unfamiliar to them or their clients (e.g. instead of asking about *cybersurveillance*, ask about *reading emails or texts*).

Advocates also encouraged the use of examples in lists of options, e.g. listing *Instagram, Facebook, or Snapchat* instead of just *social media accounts*. This spoke to a wider variety of experiences and cultural backgrounds, and advocates thought the additional clarity outweighed the drawbacks of more text. They also offered useful feedback about how clients preferred to refer to their experiences of abuse; for example, many clients might not resonate with the term "stalking", but might identify those behaviors if "monitoring" were used instead. Similarly, "person causing harm" was proposed as mission-aligned language to refer to an abusive party that was inclusive of diverse client experiences. When asked about whether the assessment questions would incur additional burdens for the advocates making referrals, a participant responded:

> *"I think an advocate doing good safety planning should already know all the answers to these questions by the time they are making the referral. This doesn't seem like it would take too much time at all. I'm really excited about this."*

We ended feedback sessions when advocates had no additional or only very minor feedback to share. After the fourth and final feedback session, we shared the updated referral form with all partner agencies for approval, offering opportunities to meet if they had concerns or questions about transitioning to the new form; all agency partners declined additional sessions and encouraged use of the new form, indicating that it was ready for a trial launch.

5 Evaluating New Referral and Assessment Processes

The finalized referral form was launched in the Clinic to End Tech Abuse, located in New York City, at the end of 2023. The form replaced the prior version in situ; advocates making referrals accessed the same link they had always used, but were directed to the updated referral form, with three questions in the old form replaced by 14 questions in the new form (compare Tables 4 and 5 in Appendix A). The updates were approved by all partners and announced to referring advocates via mailing lists. The form also included contact information for clinic managers who were available by phone and email to answer questions. Additionally, clinic managers were available upon request to attend partner staff meetings to explain the form and answer any questions. After launching the new referral form, we conducted an analysis of referred cases to understand how it was performing.

5.1 Methodology

We analyzed six months of referral data beginning March 1st, 2024, a total of 97 referrals. For each referral, clinic managers keep a copy of the submitted form, and case logs recording events related to processing the case. This includes clinic managers' assessment and decisions made about the case, attempts to communicate with the client, short summaries of communication with the client

		Eventual client outcome			
Clinic manager's initial assessment	**Total**	Not a fit	Partial Fit	Strong Fit	Indeterminate
Manager flagged the referral for assessment	49	19	20	4	6
Manager did not flag the referral	48	2	0	34	12
Total	97	21	20	38	18

Table 2. Results of our analysis of 97 client referrals received over a six month period, showing the clinic manager's initial assessment based on data provided in the referral form, and corresponding client outcomes.

(e.g. August 25: manager marked case for assessment; August 27: called client and left voicemail; Sept 1: met with client), and notes documenting the outcome of the case. In addition, Qualtrics (used to host the form), retains metadata for each submitted form, including the time spent filling out the form. We analyzed all of this information for 97 referrals.

Although it may seem natural to use data from the old referral form as a baseline for comparison, we note that we are unable to do so: many questions on the new form do not exist on the old form (compare Tables 4 and 5 in Appendix A), so we simply do not have the requisite information for comparison. Moreover, prior to our study, all referrals were automatically assigned to consultants on a first-come, first-served basis, so there are no prior clinic manager assessments to compare to. As such, data from older referrals does not provide a meaningful baseline, and may be misleading, due to missing details needed to contextualize our results. Thus, we limit our evaluation to analysis of data received via the new referral form.

First, based on the clinic manager's assessment of the information provided in the referral form, did the clinic managers flag any concerns suggesting that the case needed additional information or special handling? The possible decisions for each referral were:

(1) **Manager flagged the referral for assessment:** before accepting the case, clinic managers decided to contact the caseworker or client first to better understand the client's needs and/or determine whether the client is a fit for the clinic's available services.
(2) **Manager did not flag the referral:** the case appeared to be an appropriate fit and was assigned to an available volunteer consultant.

Second, we examined case notes and summaries to determine the eventual outcome of each client's case. The possible outcomes were:

(1) **Strong fit:** a consultant met with the client and was able to mostly address their concerns.
(2) **Not a fit:** there were no services that the clinic was able to provide.
(3) **Partial fit:** the clinic was able to provide either limited services or services that required the availability of a consultant with specialized expertise.
(4) **Indeterminate:** the clinic could not reach the client to determine fit.

5.2 Results

The clinic received 97 referrals in the six-month period of our evaluation. Table 2 shows the results of our analysis. Here, we provide additional detail on metrics that speak to the utility of the new referral form. We note that for 18/97 (18.6%) referrals received, clinic managers' attempts to contact the client were unsuccessful; this is common in IPV services, where clients are often in precarious situations and frequently change their contact information.

How long does it take to complete the new referral form? The median time taken for partners (typically advocates in collaboration with clients) to complete the new referral form was 10 minutes and 18 seconds. For the same time range the previous year, using the prior intake form, the median form completion time was 7 minutes and 23 seconds for 89 referrals. Thus, the additional questions

on the form add approximately 3 minutes. We believe this cost is reasonable; indeed, the clinic received *more* referrals using the new form in the same time period, suggesting the cost is not prohibitive. Moreover, the added time spent gathering detail on the client's technology concerns may also benefit the advocate's understanding of the client's case.

How well does the referral form enable discovery of cases that are not a fit? Overall, we determined that 21/97 (21.6%) referred clients were not a fit for the clinic's services, based on the criteria defined above. For 19/21 (90.5%) of these, the clinic manager flagged the case as needing further assessment, based on information provided in the referral form, before the client was assigned to a technology consultant. This suggests the new referral form successfully helps clinic managers to discover a lack of fit at the earliest stage, before additional resources are allocated.

The other 2/21 (9.5%) referrals that were not a fit, but were not flagged by the clinic manager, were assigned to a consultant. Inspection of the available data showed that in one of those cases, the client asked for information about the clinic's services alongside several other services, but did not have a specific technology issue. In the second case, the client did have technology concerns within the clinic's remit, but had a more urgent need of housing and mental health care that took precedence over the technology issues, with the client ultimately receiving appropriate services.

How well does the referral form enable identification of cases that are a partial fit? A total of 20/97 (20.6%) referrals were categorized as a partial fit for the clinic's services; all were flagged by the clinic manager as needing additional assessment prior to being assigned to a consultant. This suggests that the new referral form enabled clinic managers to appropriately assess and route all of these cases and that the resources invested in doing so—thereby ensuring these clients received appropriate services—were well spent.

How often are cases that are a strong fit erroneously flagged for assessment? Of the 38/97 (39.2%) referrals that were a strong fit for the clinic's services, the clinic manager determined that 34/38 (89.5%) did not require additional assessment and proceeded to appropriately assign them to volunteer consultants. This suggests that clinic managers did not need to perform many unnecessary additional assessments.

For the remaining 4/38 (10.5%) referrals, the clinic manager flagged these for assessment, but they were subsequently determined to be a strong fit. We drew on the case logs and notes to understand more about these cases. In the first, the harming party was indicated as a stranger on the referral form (i.e., not an intimate partner), but an assessment call uncovered that it was a former dating partner, which is within the clinic's remit. In the second case, the referral form noted concerns about sophisticated spyware, which an assessment call confirmed was plausible based on the information the client provided. The third case was one in which the client was seeking preventative services but was unsure which services were needed; assessment determined the clinic was able to help. The final case was flagged by the clinic manager primarily due to the referral form indicating that the need for help was urgent and listed "airtags" as a specific device of concern. In short, the client reported getting notifications that an unknown airtag was moving with them, which is within the clinic's remit. However, by the time the volunteer consultant met with the client, the client had already found the airtag and the case reverted to basic checkup/prevention services.

How and why were referrals flagged for assessment? For each of the 49/97 (50.5%) cases that the clinic manager identified as needing additional assessment, we analyzed what specific criteria on the referral form suggested this need (see Table 3). Usually, the clinic manager flagged cases where a client or referring advocate answered one or more questions relating to fit in a particular way (e.g., indicated the adversary was not an intimate partner, requested all services, or requested help that was out of scope of the available services). Individual cases often contained multiple

		Eventual client outcome			
Criterion	**Total**	Strong Fit	Partial Fit	Not a Fit	Indeterminate
Out-of-scope	**16**	0	5	8	3
Numerous tech concerns	**10**	2	3	5	0
Sophisticated "hacking"	**8**	1	2	3	2
Non-intimate adversary	**8**	1	3	4	0
Limited contact availability	**8**	0	3	4	1
Note from advocate	**6**	0	2	4	0
High urgency	**4**	0	2	2	0
Service modality	**3**	0	1	2	0
Total	**63**	4	21	32	6

Table 3. Summary of criteria identified during assessment and eventual outcomes of client referrals received. Note that individual referrals can have multiple criteria.

criteria: the 49 flagged cases had a total of 63 identified issues. On average, cases that the clinic manager flagged but were nevertheless a good fit for the clinic (4 cases) had an average of 1.3 issues each, with strong and partial fit cases having an average of 1.9.

As Table 3 shows, requesting out-of-scope services was the strongest indicator for the clinic manager that a case was either not a fit or a partial fit: zero cases with this criterion were in fact a strong fit for the clinic's services. A handful of other criteria were similarly always effective at helping clinic managers identify cases that were either not a fit or a partial fit, including when the referral form indicated difficulties around contacting the client, cases with high urgency, or cases where the client was uncomfortable with the phone-based modality of the clinic's services. Finally, all cases where a referring advocate proactively sent a note to the clinic manager were subsequently found to be either not a fit or a partial fit.

Several other criteria were usually, but not always, accurate at helping the clinic manager identify cases that needed further assessment. Referrals in which the client requested every possible service was the second most frequent issue, although clinic managers flagged two such cases that were in fact a good fit for the clinic. Similarly, referral forms that described vague or sophisticated "hacking" were often noted in the case notes as a possible sign of hypervigilance, and did indeed often indicate that the case was not a good fit. However, in one instance the client's concerns were in fact plausible and the case was a good fit. Finally, some referral forms contained errors or misunderstandings that led to the clinic manager erroneously flagging the case, such as indicating that the harming party was not an intimate partner when in fact they were a dating partner (as explained above). Fortunately, instances where clinic managers identified issues erroneously were infrequent, meaning that clinic managers did not need to perform many unnecessary extra assessments. Moreover, in cases clinic managers did erroneously flag cases, the new clinic coordination processes helped to ensure these cases were assessed and the clients received help.

6 Discussion

The goal of our research was to investigate how to incorporate trauma-informed principles into organizational and coordination processes in a novel and high-stakes context: computer security clinics for IPV survivors. We analyzed how the clinics' client referral processes constitute key sites for inter-organizational coordination work. We identified challenges with current referral and assessment tools (Section 3), including the potential for misalignment between survivors' needs and clinics' services, which may heighten the risk of both re-traumatization for clients and vicarious trauma for providers. In response, we designed a new coordination mechanism (Section 4) that

utilizes carefully structured questions in a referral form followed by semi-structured assessment conversations that function both as a guide for advocates and clients seeking clinic services and as an assessment tool that enables clinic managers to determine if the clinic is a good fit for the client's needs. Finally, we show how the structured questions in the new referral impacted clinic coordination and outcomes by analyzing 97 client referrals received over six months (Section 5). We now discuss (1) how trauma-informed principles are interwoven into the inter-organizational coordination process, (2) the impact of the new process on consultants' and survivors' experiences of TIC, and (3) limitations of our work.

6.1 Embedding TIC into Inter-organizational Coordination

Research has shown that clinics struggle to provide TIC when survivors arrive at consultations seeking services for concerns that are non-specific, highly sophisticated, or out of scope [60, 81]. We expand this literature by unpacking the role that organizational structures play in this phenomenon. We find that clinics need information to assess whether a client's concerns may be addressed in a consultation with a volunteer technologist; if not, the clinic should help the survivor and advocate to find better suited services. However, before our work, clinic referrals did not contain the requisite information to reliably make this decision, resulting in unsatisfying or potentially harmful experiences for survivors and consultants.

This challenge arises in part because clinics originally employed open-ended questions in their referral processes, wanting to provide space to accommodate survivors' individuality and varied experiences. However, clinics exist in a context characterized by asymmetrical technology knowledge (a gap also relevant in other contexts [75]): by definition, referring advocates and clients do not possess sufficient knowledge to address technology-facilitated abuse the client is experiencing; if they did, they would not need the clinic's services. Unfortunately, open-ended questions, although providing ample space for expression, fall short in helping advocates and survivors navigate this knowledge gap. As a result, referrals often omit key pieces of information necessary for the clinic to evaluate the request. As Bossen and Grönvall point out, this misses an opportunity to use the referral and assessment processes as coordination mechanisms that provide a "shared platform of communication" [14] that bridge the knowledge gap.

We show how to redesign these coordination mechanisms to strike a balance between providing sufficient structure for advocates and survivors to navigate this gap, while preserving space for sensitive disclosures. The goal is to ensure that, if survivors do disclose traumatic experiences, they do so with a professional who is equipped to respond.

Our redesigned coordination mechanisms consist of two steps. The first consists of a referral form with structured questions and clear, delimited options. This enables clinic managers to evaluate the technical concerns without requiring technology expertise from the advocate or survivor completing the form. Moreover, the questions' structure and content do not require advocates to know about the clinic's specific services, which may also ameliorate challenges associated with high staff turnover at partner organizations, a salient challenge also encountered in inter-organizational coordination in human trafficking contexts [75].

Notably, we diverge from literature arguing that high levels of flexibility are necessary to guarantee effective coordination in complex settings [14, 17]. Instead, our work suggests that structure has a valuable place in trauma-informed coordination mechanisms, particularly in the presence of such knowledge gaps. Where open-ended questions alone may compel survivors to disclose details of abuse or revisit traumatic experiences, structure provides an implicit guide as to which details are relevant and necessary. Importantly, the structured questions pertain only to aspects of digital safety that the clinic has the expertise to evaluate, and do not overtly prompt the survivor to disclose information about their trauma history or mental health.

Crucially, the structured referral of the first step is counterbalanced by the second step, in which a survivor has the opportunity for an open-ended conversation with a clinic staff member, with the referral form informing the professional background and training of the staff member who contacts the survivor (see Figure 3). In sensitive contexts like IPV, delimited options cannot encompass the breadth of survivors' experiences. Survivors may not disclose relevant information without additional prompts, or may have encountered dismissal or invalidation when approaching other support services (e.g., law enforcement) about technology-facilitated abuse. However, survivors' responses to the form's closed-ended questions may help set safer boundaries during open-ended conversations that follow the initial referral, offering space for a survivor to share nuances of their experiences and needs with staff who can create that safe space. In these conversations, even when the survivor's needs are ultimately incompatible with the clinic's remit, clinic managers can still validate the survivor's experiences and empathetically explain why the clinic is not able to meet the goals—all key elements of person-centered, trauma-informed care [51].

In sum, this two-step process satisfies two tenets of TIC: the first tenet discourages the re-traumatization that is an inherent risk of open-ended questions, while the second encourages creating empathetic and caring spaces for sensitive disclosures. The structured format of the first step mitigates opportunities for retraumatization while allowing clinic staff to better navigate ensuing the open-ended conversations that comprise the second step. These insights could inform research and practice in domains beyond IPV, particularly those involving navigation of similar knowledge gaps to achieve inter-organizational coordination in high-stakes settings, including human trafficking [75], medical care [14], homelessness [69], and more.

6.2 Benefits of Improved Coordination

Clinics have an ethical obligation to support and care for staff who are exposed to vicarious trauma in their work [19]. While this exposure is inevitable when working with trauma survivors, organizational support can minimize the effects of this exposure or even promote vicarious resilience [37], in which workers' experiences providing services leave them better able to cope with traumatic experiences in their work and personal lives. Research suggests that being made aware of another person's traumatic experiences while being powerless to help is especially likely to lead to negative effects of vicarious trauma [8, 68]; conversely, being both aware and empowered to help can promote vicarious resilience [37, 38]. Through this lens, our findings suggest that, via the improved coordination processes, consultants are more likely to meet with survivors that they able to help, and less likely to participate in consultations where they are not. This might both improve consultants experiences and enable organizational structures that actively promote vicarious resilience over vicarious trauma [19].

The new coordination mechanisms may also better align with providing TIC for survivors [48]. In particular, they mitigate the potential for unnecessary retraumatization, which can occur when survivors are required to re-tell their experiences, even in a supportive setting [41]. Volunteer consultants typically ask for some background context at the start of an appointment to narrow the scope of inquiry [35], and it is not uncommon for survivors to disclose detailed histories of abuse in response to these general prompts. This is particularly so in technology abuse services, in part because survivors may not know which information is relevant, as discussed above, or because survivors, having experienced dismissal or invalidation of their technology concerns in the past, feel compelled to disclose detailed accounts of the abuse in order to be believed [21, 60, 90]. Moreover, as consultations are typically over an hour long [29, 81], survivors must often make arrangements to attend the consultation, including taking time off work or finding childcare. Altogether, this imposes logistical and emotional burdens on survivors seeking help.

Enabling clinic managers to detect potential misalignment early could help alleviate some of these challenges. Clinic managers are well-positioned to navigate delicate conversations with survivors in which they validate the survivor's experiences and work to determine whether their digital safety goals can be met by the clinic's services. Clinic managers may also be in touch with the broader ecosystem of available services and able to suggest alternate resources should the survivor realize that the clinic's services may not address their concerns. Finally, by recognizing potential misalignment from the outset, clinic managers can arrange shorter conversations, obviating the need for the survivor to block off large amounts of time.

As discussed in Section 5, in some cases these shorter conversations concluded that the clinic *was* the right service for the client's needs: roughly half of all the referrals flagged by the clinic manager were ultimately determined to be a partial fit for the clinic's services. In most of these cases, survivors were experiencing more complex types of technology-facilitated abuse, and clinic managers were able to use the conversation as an opportunity to both set expectations with the survivor and gather information that might better prepare the consultant.

This reinforces the need to avoid discounting or stigmatizing survivors who seek service for low-probability, high-sophistication attacks; our findings suggest that we can instead treat these clients as meriting additional care and route them to consultants with appropriate specialization. Nonetheless, clients who are experiencing mental health challenges manifesting in, for example, technology-based conspiracies, may benefit from *not* meeting with a consultant whose well-meaning assistance may in fact lead to unintended consequences that exacerbate the client's mental health issues [56, 60], and the improved coordination process is effective in flagging in such cases.

6.3 Limitations

Our study has several limitations. First, we did not explicitly solicit survivor feedback, although one member of the expert panel self-identifies as a survivor who has sought services at a clinic. Best practices for research with at-risk groups encourages relying on literature and domain experts before contacting survivors [9]; we drew on rich literature on TIC and engaged IPV experts in every stage of our work. Nonetheless, future work should examine survivor perspectives to deepen our understanding of scoring process and uncover potential unintended consequences of the open- vs closed-ended coordination processes. While our studies show promise, we also recognize the need for additional studies that entail detailed investigations into stakeholder perspectives, including the impact of structured questionnaires on survivors, in line with prior work that examines how data practices interact with sensitive populations [42, 43].

Our study also has methodological limitations; one is the inherent ethical limitation preventing randomized trials in contexts like IPV. Thus, we are limited to indirect and retroactive methods of studying organizational effectiveness. In addition, participants varied across our research: while Sections 3 and 4 involve participants from three clinics at different sites, our evaluation in Section 5 occurred at a single clinic, which is currently the only clinic that is instrumented to collect sufficient data. Lastly, there is no baseline to compare our results to in Section 5; simply put, prior to this study, *all* referrals were routed to technology consultants, so there is no meaningful, comparable data from which to calculate a baseline. We hope our study serves as a baseline moving forward.

7 Conclusion

We examine how to coordinate access to resources in computer security clinics. We show that embedding trauma-informed principles into clinics' organizational structure—specifically the referral and assessment processes—helps ensure that survivors' needs will be met in ways that are safe, transparent, and meaningful for the survivor. We also show how incorporating TIC principles into inter-organizational coordination mechanisms can reduce the potential that technology

consultants experience vicarious trauma, since they are more likely to meet with clients they are equipped to support. Our work contributes a guiding example of how to design trauma-informed coordination mechanisms that account for the complexities of an inter-organizational ecosystem and an evaluation of those mechanisms' effects on service coordination in a real-world context.

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A Appendix

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Label	Question	Answers
A1	Are you seeking help for technology issues related to one of the following situations?	○ Intimate partner violence (ex-spouse, dating partner) ○ Family violence, ex: eparent, child, or sibling ○ Other _____
A2	Which of the following tasks would you like the clinic to help with?	□ Securing a phone, email, or messaging apps □ Finding sources of e-stalking or location tracking □ Managing online harassment (texts, emails, calls) □ Learning general safety advice □ Other _____ (please fill in)
A3	Which devices would you like help securing?	□ An email account □ An iPhone or other Apple device □ A non-Apple phone, laptop, or device □ Social media (Facebook, Instagram, Tiktok) □ Other _____ (please fill in)
A4	Are you okay with receiving services provided over the phone or by email?	○ Yes ○ No/need more information
B1	Do you currently share a phone plan with the person causing harm?	○ Yes, currently share a phone plan ○ No, no longer or never shared a phone plan
B2	Does the person causing harm seem to know the contents of your emails or text messages?	○ Yes ○ No ○ Maybe/not sure
B3	Has the person causing harm stalked you in the past or seemed to know your location when they shouldn't?	○ Yes ○ No ○ Maybe/not sure
B4	Which statement best describes the person causing harm's technology abilities or knowledge?	○ Okay with technology ○ Very good, but no professional or formal training ○ Has professional or formal training ○ Other _____
B5	Has the person causing harm been able to physically hold your devices?	○ Yes ○ No ○ Maybe/not sure
C1	Which statement best describes your living situation with respect to the person causing harm?	○ Currently living with this person ○ Recently separated from living with this person ○ Never lived together or separated for a long time ○ Other_____
C2	Do you share custody of children with the person causing harm?	○ Yes, shared custody of children. ○ No children/sole custody/other
C3	Do you need help before an important upcoming date?	○ Yes (please fill in date) _____ ○ No
C4	How would you describe the impact the situation has on your safety?	□ It poses a risk to my physical safety. □ It impacts my ability to earn a living or function. □ It impacts my emotional state or well-being.
C5	Is there anything else you'd like to share?	Free response

Table 4. The new assessment form with responses. Options with squares indicate that users can *select multiple* and circles indicate to *select one*. Note that we omit questions not relevant to this study (e.g., client and advocate name and contact information, etc.) Question and response options are lightly edited for length.

Label	Question	Answers
Q1	Are you concerned about a device, such as a phone or computer? If so, what kind of phone or computer are you worried about? (You can choose more than one.)	□ iPhone □ Android phone □ iPad □ Android tablet □ Laptop □ Desktop computer □ Other (please explain)
Q2	Are you concerned about an online account, such as email or social media? If so, what kind of online account are you worried about? (You can choose more than one.)	□ iCloud □ Gmail / Google account □ Facebook □ Instagram □ WhatsApp □ Other (please explain)
Q3	Please briefly explain the problems you are hoping we can help with.	Free response

Table 5. The three questions and possible responses from the previous referral form that were replaced by the 14 questions in the new form. Note that we omit questions not relevant to this study (e.g., client and advocate name and contact information, etc.) Options with squares indicate that users can select multiple.