

# Beyond perpetrators and victims: A systems ergonomics perspective on technology-facilitated abuse

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## SUMMARY

Technology-facilitated abuse (TFA) is prevalent in cases of intimate partner violence. This scoping review applied a systems ergonomics model, Rasmussen's Risk Management Framework, as a novel approach to map the known factors that influence TFA in the context of intimate partner violence. The findings showed that the literature has focused on factors related to actors directly involved in TFA (e.g., perpetrators and victim-survivors) and that inadequate systemic responses influence the persistence of TFA. The utility of applying systems ergonomics to understand and address complex and pervasive social problems was demonstrated.

## KEYWORDS

Technology, Technology-facilitated abuse, Intimate partner violence, Systems ergonomics

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## Introduction

The use of technology to facilitate abuse within intimate relationships is highly prevalent (Douglas et al., 2025). Technology-facilitated abuse (TFA) describes the misuse or repurposing of technology to harass, coerce, or abuse (Koukopoulos et al., 2025), and often co-occurs with other forms of intimate partner violence, including coercive control (i.e., enduring patterns of behaviour designed to control and dominate) and physical violence (DeKeseredy et al., 2021). In some countries, men's exploitation of technology to abuse and obsessively stalk female partners and ex-partners is an emerging trend in intimate partner homicide (Domestic and Family Violence Death Review and Advisory Board Report, 2017). Globally, research shows that TFA against women is widespread, with an estimated prevalence of 30.6% (Benitez-Hidalgo et al., 2025).

The widespread integration of technology in today's world provides perpetrators of domestic abuse with accessible mechanisms to extend coercion and control, contributing to a sense of omnipresence that intensifies victim-survivors' fear and anxiety (DeKeseredy et al., 2017; Freed et al., 2017). TFA behaviours are vast and may range from harassing and threatening text messages and emails, to monitoring a victim's movements via global positioning systems (GPS), surveillance cameras, smart home devices, and stalker apps, to controlling access to finances via electronic financial services (Dragiewicz et al., 2021; Freed et al., 2017). To date, while research has provided insights into the problem of TFA, the extent of investigation into broader system factors that influence TFA is unknown.

## Using systems ergonomics for complex issues

Systems ergonomics is a widely accepted approach for understanding complex issues (Dekker, 2011). Rasmussen’s Risk Management Framework (RMF; Rasmussen, 1997) is a well-established systems ergonomics model that has been used beyond traditional ergonomics applications to understand complex public health and social issues (e.g., Cox et al., 2024; Dodd et al., 2024), including criminal or harmful behaviours (e.g., Salmon et al., 2018; Salmon et al., 2019). The RMF conceptualises complex systems as comprising multiple hierarchical levels with distinct roles and responsibilities (e.g., government, regulatory bodies, management, supervisors, frontline actors, and the work environment) who share the responsibility for safety and system function. Decisions and actions from those both proximal (e.g., victim-survivors, perpetrators, their social networks) and distal (e.g., police, government, policymakers) to the target behaviour interact to shape system behaviour and safety. By providing a representation of these hierarchical relationships, the RMF supports the identification of structural and contextual influences on system outcomes (Rasmussen, 1997). An adapted RMF illustrating a generic TFA system is presented in Figure 1.

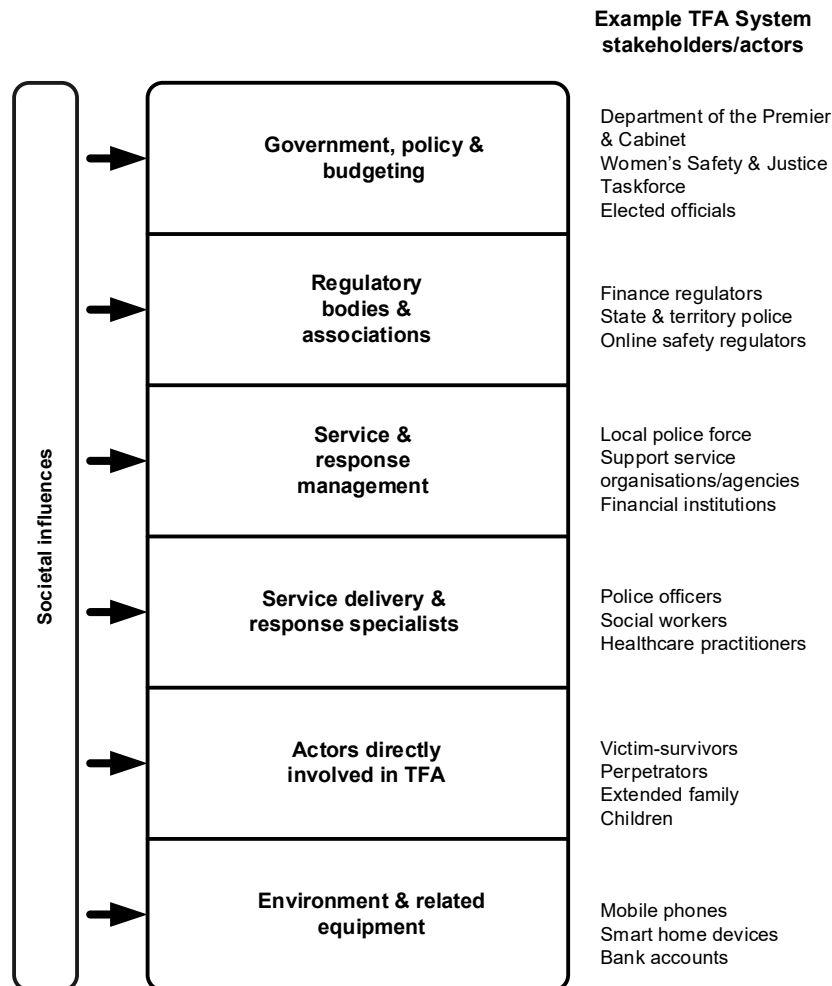


Figure 1: Adapted Rasmussen’s Risk Management Framework (RMF)

### Aim

Using the RMF, a scoping review was undertaken to: (1) identify what is currently known regarding the individual, situational, environmental, technological, and systemic factors that influence TFA; and (2) identify at which levels of the TFA system these influencing factors are situated.

## Method

An electronic literature search (all years to date) was conducted between 16<sup>th</sup> and 21<sup>st</sup> of August 2024 (inclusive), on five databases. The search yielded an initial 10,758 records and was followed by a screening process that resulted in a final data set of 84 records.

Publication information was extracted for each record (e.g., geographical location, study design, methodology, theory applied, and terms used to describe TFA). Factors that influence TFA were also extracted where they were reported to influence TFA or be associated with another influencing factor. The factors were grouped into high-level themes that were then mapped to the following adapted RMF hierarchical levels: (1) Environment and related equipment; (2) Actors directly involved in TFA; (3) Service delivery and response specialists; (4) Service and response management; (5) Regulatory bodies and associations; (6) Government policy and budgeting.

## Results

The analysis identified 28 influencing factor themes from 148 extracted factors. There was a disproportionately higher number of themes identified at the lower levels of the TFA system. Specifically, the lower-level themes related to individual-level traits and vulnerabilities (e.g., personality traits, adverse childhood experiences) of both victim-survivors and perpetrators of TFA. Comparatively, there were fewer themes identified at the higher levels of the system. These themes included inadequate higher-level responses that influenced the persistence of TFA (e.g., inadequate police or legal responses).

Additionally, broader societal and cultural issues that span multiple system levels were also identified (e.g., structural gender imbalances, surveillance culture).

## Key takeaways

The findings demonstrate that the causes of TFA are complex, multi-factorial, and relate not only to perpetrators and victim-survivors but also to police response, legal systems, and societal and cultural issues. This study builds on previous work exploring the application of systems ergonomics approaches to understand criminal behaviours (e.g., Salmon et al., 2019) and demonstrates their utility for responding to complex and pervasive social issues. The review also identified key gaps in the knowledge base regarding the factors that influence TFA. The identification of inadequate responses to TFA in this review also suggest a need to specifically study the TFA response system to identify interactions and feedback loops that influence its effectiveness. The unique insights provided by systems ergonomics methods can enhance the current TFA knowledge base, inform policy and practice change, and improve the effectiveness of intervention initiatives in this area. Future applications of systems ergonomics approaches, including the RMF, to complex social issues (e.g., homelessness, racial discrimination, access to healthcare) are encouraged.

## Acknowledgements

This research was funded by an Australian Government Research Training Program Scholarship.

## References

- Benitez-Hidalgo, V., Henares-Montiel, J., Ruiz-Pérez, I., & Pastor-Moreno, G. (2025). International prevalence of technology-facilitated sexual violence against women: A systematic review and meta-analysis of observational studies. *Trauma, Violence, & Abuse, 26*(4), 668-681. <https://doi.org/10.1177/15248380241286813>
- Cox, J. A., Mills, L., Hermens, D. F., Read, G. J., & Salmon, P. M. (2024). A systematic review of the facilitators and barriers to help-seeking for self-harm in young people: A systems thinking

perspective. *Adolescent Research Review*, 9(3), 411-434. <https://doi.org/10.1007/s40894-024-00241-3>

- DeKeseredy, W. S., Dragiewicz, M., & Schwartz, M. D. (2017). *Abusive endings: Separation and divorce violence against women*. University of California Press. <https://doi.org/10.1525/9780520961159>
- DeKeseredy, W. S., Stoneberg, D. M., & Lory, G. L. (2021). Polyvictimization in the lives of North American female university/college students: The contribution of technology-facilitated abuse. In *The Emerald international handbook of technology-facilitated violence and abuse* (pp. 65-81). Emerald Publishing Limited. <https://doi.org/10.1108/978-1-83982-848-520211004>
- Dekker, S., Cilliers, P., & Hofmeyr, J. H. (2011). The complexity of failure: Implications of complexity theory for safety investigations. *Safety science*, 49(6), 939-945. <https://doi.org/10.1016/j.ssci.2011.01.008>
- Dodd, K., Solomon, C., Naughton, M., Salmon, P. M., & McLean, S. (2024). What enables child sexual abuse in sport? A systematic review. *Trauma, Violence, & Abuse*, 25(2), 1599-1613. <https://doi.org/10.1177/15248380231190666>
- Domestic, Q. (2017). *Queensland Domestic and Family Violence Death Review and Advisory Board 2016–17 Annual Report*. <https://www.coronerscourt.qld.gov.au/dfvdrab/annual-reports-and-government-responses>
- Douglas, H., Tanczer, L., McLachlan, F., & Harris, B. (2025). Policing technology-facilitated domestic abuse (TFDA): Views of service providers in Australia and the United Kingdom. *Journal of family violence*, 40(2), 341-352. <https://doi.org/10.1007/s10896-023-00619-2>
- Dragiewicz, M., Harris, B., Woodlock, D., & Salter, M. (2021). Digital media and domestic violence in Australia: Essential contexts. *Journal of Gender-Based Violence*, 5(3), 377-393. <https://doi.org/10.1332/239868021X16153782923978>
- Freed, D., Palmer, J., Minchala, D. E., Levy, K., Ristenpart, T., & Dell, N. (2017). Digital technologies and intimate partner violence: A qualitative analysis with multiple stakeholders. *Proceedings of the ACM on human-computer interaction*, 1(CSCW), 1-22. <https://doi.org/10.1145/3134681>
- Koukopoulos, N., Janickyj, M., & Tanczer, L. M. (2025). Defining and conceptualizing technology-facilitated abuse (“Tech Abuse”): Findings of a global delphi study. *Journal of Interpersonal Violence*, 08862605241310465. <https://doi.org/10.1177/08862605241310465>
- Rasmussen, J. (1997). Risk management in a dynamic society: a modelling problem. *Safety Science*, 27(2-3), 183-213. [https://doi.org/10.1016/S0925-7535\(97\)00052-0](https://doi.org/10.1016/S0925-7535(97)00052-0)
- Salmon, P. M., Carden, T., & Stevens, N. J. (2018). Breaking bad systems: Using work domain analysis to identify strategies for disrupting terrorist cells. *Proceedings of Ergonomics and Human Factors*. <https://publications.ergonomics.org.uk/uploads/Breaking-bad-systems-using-work-domain-analysis-to-identify-strategies-for-disrupting-terrorist-cells.pdf>
- Salmon, P. M., Lane, B. R., Desmond, D., Cherney, A., Kulatilleke, G., Matthews, A., ... & Stanton, N. A. (2019, November). Breaking bad systems with Human Factors and Ergonomics: Using Work Domain Analysis to identify strategies to disrupt trading in dark net marketplaces. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* 63(1), 458-462. <https://doi.org/10.1177/1071181319631315>