Cyprus University of Technology
Faculty of Communication and Media Studies

Doctoral Dissertation

NUDGING AGAINST MISINFORMATION: A RESEARCH-THROUGH-DESIGN APPROACH

Loukas Konstantinou

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CYPRUS UNIVERSITY OF TECHNOLOGY

FACULTY OF COMMUNICATION AND MEDIA STUDIES

DEPARTMENT OF COMMUNICATION AND INTERNET STUDIES

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Dr. Evangelos Karapanos, Associate Professor

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Approval Form

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Some journeys are measured in pages, others in years, and a few more in the people who make them meaningful and worthwhile. This Ph.D. has been all three; it has been a path shaped by ever-shifting questions, challenges that demanded patience, and discoveries that emerged slowly, sometimes unexpectedly. What began as a pure academic pursuit became a human journey, marked by growth, maturation, and the presence of those who helped light the way forward. My sincerest gratitude goes to my advisor, Dr. Evangelos Karapanos, whose guidance has profoundly shaped my intellectual development. His ability to challenge my assumptions, broaden my perspectives, and nurture my curiosity, has been invaluable. Under his mentorship, I learned to approach research as a continuous exploration of ideas and possibilities. Thank you, professor, for encouraging me to think outside the box, and for questioning the boundaries of what I considered obvious! To my mother, whose support has been the force behind my work, thank you. Your help has been guiding me through the most demanding moments. I extend my heartfelt thanks to all those who supported me in ways both seen and unseen…

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The present doctoral dissertation includes material drawn from five peer-reviewed publications which were produced during the course of the candidate's doctoral research. The candidate is the first author on all of the five works, and was primarily responsible for preparing, submitting, and refining the delivered manuscripts. As such, substantial portions of the included text, figures, tables, analyses, findings and discussions are reproduced or adapted from the following publications:

1. Konstantinou, L., Panos, D., & Karapanos, E. (2025). Exploring the design of technology-mediated nudges for online misinformation. *International Journal of Human–Computer Interaction*, *41*(1), 515-542.
2. Konstantinou, L., & Karapanos, E. (2025). How Do Users Perceive Nudges Against Online Misinformation? A Repertory-Grid Study. *International Journal of Human–Computer Interaction*, *41*(24), 15551-15569.
3. Konstantinou, L., & Karapanos, E. (2025). Behavior change interventions combating online misinformation: a scoping review. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems* (pp. 1-19).
4. Konstantinou, L., & Karapanos, E. (2026). Google inject: increasing engagement with fact-checks through nudging. *Behaviour & Information Technology*, *45*(1), 1-18.
5. Konstantinou, L., & Karapanos, E. (2026). The Correction Paradox: Why Fact-Checking May Fail to Tackle Vaccine Hesitancy. *Computers in Human Behavior Report*, Under Review

Where the publications' material has been reused, it has been appropriately cited. The included content has been revised and integrated to ensure coherence and consistency within the present doctoral thesis.

ABSTRACT

The last decade has witnessed an exponential rise of misinformation, which poses significant challenges at an individual (e.g., fuelling the *headline stress disorder* and other negative feelings), organizational (e.g., shaping echo chambers for the circulation of conspiracy theories like "*PizzaGate*"), and societal (e.g., undermining public debates for topics like *Brexit*) level. Misinformation proliferation is facilitated by different factors, including the openness and automation of social media platforms, the absence of custodians for establishing and preserving information credibility standards, and the extensive usage of malicious social bots. While efforts have been intensified to tackle this phenomenon, many of the proposed interventions are based on the notion that simply providing corrective information will suffice in prompting better information-related behaviors, while ignoring the impact of *systematic thinking errors* on human behavior. Drawing on insights from Behavioral Science, *nudging* is a promising response to address misinformation by capitalizing on the influence of cognitive biases through choice architecture. Yet, existing digital nudge guidelines remain insufficient, while key design considerations (e.g., contextual factors, implementation choices) are overlooked. In response, this doctoral thesis investigates how to efficiently design technology-mediated nudges against online misinformation, taking into consideration several key pillars: behavioral objectives nudges may pursue, possible reasons of behavioral failure, and ways for ensuring user autonomy. Rather than adopting approaches rooted in Health Psychology – typically addressing behavioral intervention development through a sequential process separating problem understanding from solution evaluation, this thesis advocates for a design-oriented approach. The *Research-through-Design* methodology is employed, which treats design activities as legitimate methods of scientific inquiry, and facilitates the co-evolution of problem reframing and solution seeking. This methodology is structured around the *Double-Diamond* model, encompassing design space exploration and solution implementation. Within the first diamond, multiple nudging concepts are generated and assessed with relevant stakeholders, while in the second diamond, multiple variations of a particular fact-check nudge are prototyped, and its optimal design is evaluated for behavioral effectiveness. Overall, this thesis contributes by expanding the design space of technology-mediated nudging against online misinformation through identifying behavioral objectives,

reasons for failure, and approaches to preserving user autonomy. It further contributes by implementing and evaluating a fact-checking nudge intervention, demonstrating how design factors shape user responses and how context and target population influence effectiveness. Finally, it contributes by generating design knowledge in the form of novel anti-misinformation artefacts and intermediate-level knowledge to guide future nudge instantiations.

Keywords: Online Misinformation, Nudging, Research-through-Design, Double Diamond, Constructive Research