

**Thesis Project Portfolio**

**The Influence of Dark Patterns on User Behavior: Evaluating Social Media Design Choices**

(Technical Report)

**Navigating Technology in Early Childhood: The Role of Parents, Teachers, and  
Policymakers**

(STS Research Paper)

An Undergraduate Thesis

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## **Table of Contents**

Sociotechnical Synthesis

The Influence of Dark Patterns on User Behavior: Evaluating Social Media Design Choices

Navigating Technology in Early Childhood: The Role of Parents, Teachers, and Policymakers

Prospectus

## **Sociotechnical Synthesis**

This project addresses the widespread lack of digital literacy among adults in the United States, a gap that affects how they navigate digital platforms and guide their children's technology use. On the technical side, my research focuses on manipulative design features that take advantage of users' trust and attention, also known as dark patterns, in social media. Many users are unaware of these tactics and engage with platforms without recognizing the ways in which their behavior is being shaped. On the STS side, I investigate how limited digital literacy among key stakeholders, especially parents, shapes their interpretations of digital technology, leading to differing expectations, misalignments, and inconsistent approaches to integrating devices into children's daily lives. Together, these projects demonstrate how insufficient digital literacy among adults not only leaves individuals vulnerable to manipulation but also shapes the broader technological environment in which children are raised.

As social media platforms optimize for engagement, they often rely on dark patterns that blur the line between persuasive and unethical design, prioritizing platform metrics over user well-being. Most users remain unaware of these manipulative techniques, engaging with platforms from a place of trust rather than skepticism, which leaves them vulnerable to exploitation. My technical project aims to explore how dark patterns influence user behavior and engagement on social media platforms. I analyzed the top ten social media platforms in the U.S. to identify dark patterns, focusing on visual and linguistic cues that encourage compulsive engagement, obscure privacy options, or nudge users toward certain actions (e.g., auto-play, misleading opt-out buttons). I found common features such as urgency, misdirection, social proof, and obstruction across all platforms. Additionally, sentiment analysis of comments on trending YouTube videos revealed that negative sentiment correlates with higher engagement,

indicating that emotionally charged content fuels interaction. My findings highlight the pervasive nature of dark patterns and the need for greater user awareness and ethical reconsideration in platform design.

The debate over whether early childhood technology use supports or hinders development creates uncertainty and conflicting guidance for parents, educators, and policymakers. In my STS paper, I used the Social Construction of Technology (SCOT) framework, particularly the concept of interpretative flexibility (Pinch & Bijker, 1984/2012), to examine how the stakeholders' perceptions of technology shape their approaches to integrating it into children's lives. I analyzed peer-reviewed articles featuring interviews and surveys to understand parent and educator perspectives, and reviewed relevant state and federal legislation to assess policymaker priorities on digital literacy and online safety. I found that parents are central to managing children's technology use but often feel unequipped to do so effectively. Educators must share this responsibility by teaching digital literacy early and reinforcing healthy habits. Policymakers should provide resources to support families and schools, ensuring all children, regardless of social status, can safely navigate digital spaces. Stronger collaboration across these groups, along with targeted support for parental digital literacy, will lead to more cohesive and effective strategies for managing children's digital lives.

Overall, my research contributes to a better understanding of how insufficient digital literacy among adults leads to real consequences. My technical project aims to bring more awareness to the presence of dark patterns in social media design and to contribute to the development of tools for identifying manipulative content. My STS research brings attention to the need for better support systems for parents navigating the digital landscape with their children. While this work begins to fill an important gap, more research is needed to explore how

digital literacy interventions can be tailored to different audiences, and how collaborative approaches across schools, homes, and policy can be implemented to empower both adults and children in a digital age. Future work should focus on expanding structured datasets on manipulative language to improve detection tools and conducting cross-platform sentiment analysis during major events to better understand social media's role during periods of heightened emotional engagement. I encourage researchers to explore how children perceive their own technology use, whether as a learning tool, source of entertainment, or form of connection. Additionally, researchers should examine successful examples of collaboration among policymakers, educators, and caregivers to inform more cohesive and effective digital literacy strategies.

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