Ulysses' ropes and the inherent limits of digital self-control tools

Extended Abstract

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ABSTRACT

Millions of users install digital self-control tools (DSCTs) in order to limit their device usage. Previous inductive HCI research on DSCTs has shown that these tools are not always effective. However, it is unclear if these failures are inherent to DSCTs or merely incidental. In response, this analysis uses a deductive method to identify and classify the inherent limits of DSCTs. First, Homer's siren story from *The Odyssey* is presented as an ideal form of self-binding. The ideal self-binding strategies used by Ulysses are then contrasted with the actual self-binding opportunities afforded by DSCTs. This contrast highlights several inherent limits of DSCTs: incomplete binding, inability to comprehensively detect or correct circumventions, inability to allow legitimate overrides, instability, and pressuring of users due to other embodied desires. Further implications of this analysis include that users must maintain a minimal level of self-discipline for DSCTs to be effective, and that recognition of legitimate DSCT overrides may become possible by incorporating other individuals.

Author Keywords

Human-computer interaction; attention; self-binding; social media; behavioral intervention; digital wellbeing; addiction

1 ULYSSES' ROPES

Self-binding refers to a voluntary action by an individual that knowingly limits the individual's available actions at a later point [1]. An ideal form of self-binding is presented in *The Odyssey*, Homer's epic tale. After mentioning the deadly yet enchanting sirens, Odysseus (Ulysses) tells his crewmates:

> "...I alone should hear their singing. Bind me, to keep me upright at the mast, wound round with rope. If I beseech you and command you to set me free, you must increase my bonds and chain me even tighter." [2]

Ulysses then plugs his crewmates' ears with wax. His crewmates tie him to the mast, and Ulysses listens to the sirens. After sailing past the sirens, Ulysses nods to his crewmates, and they remove the wax from their ears and untie him.

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2 DIGITAL SELF-CONTROL TOOLS

Digital self-control tools (DSCTs) are self-binding applications that constrain future usage of devices or specific applications. These tools are intended to align future behavior with present goals. DSCTs may be installed on a variety of platforms, including computers, web browsers, and mobile devices. Lyngs et. al [3] propose four general methods of digital self-control: blocking or removal of specific features, self-tracking, goal-enhancement, and reward/punishment. Specific examples of digital self-control include motivational quotes, blocking of web elements, and visualization of time spent [3].

Previous empirical research has employed user review analysis and semi-structured interviews to identify failure modes common to digital self-control tools [4,5]. However, these papers do not determine if the identified failures stem from inherent limits of DSCTs—or rather, if they are caused by incidental or temporary flaws.

3 EXPOSITION OF INHERENT LIMITS

In response, the following analysis illustrates inherent limits of digital self-control tools by method of contrast with the ideal case of Ulysses' ropes. I will elaborate on this analysis in the presentation; real-world examples of each limitation will be provided.

3.1 INCOMPLETE BINDING

Ulysses' self-binding is absolute: it is impossible for him to escape his ties.

Yet the constraints offered by digital self-control tools are inherently incomplete. Although some digital self-control tools are resistant to technical means of circumvention, even the most circumvention-resistant digital self-control tool is limited by its opt-in installation. A user may simply borrow a friend's device or use a public device if they wish to ignore the tool.

Both Williams and Elster [6,7] note that technologies may be represented on a continuum of constraint (perhaps from tools that "invite" to those that "demand.") Ulysses' ropes demand obedience. Yet digital self-control tools merely invite (with varying levels of emphasis) that the user complies. Increasingly restrictive digital self-control tools may engender increased circumvention instead of increased compliance.

3.2 INABILITY TO COMPREHENSIVELY DETECT OR CORRECT CIRCUMVENTIONS

Ulysses, enthralled by the sirens, attempts to break free from his bonds. He begs his crewmates to loosen him; instead, they tighten his ropes.

In contrast, digital self-control tools cannot comprehensively detect or correct attempts by users to circumvent imposed restrictions. This implicitly promotes avoidance behaviors: users may spend unlimited time attempting to circumvent restrictions, which may be as deleterious to the user's prior goals as time spent on the restricted action itself.

The social nature of user review systems also fosters the dissemination of circumvention strategies. These strategies (whether unintentionally or intentionally discovered) are often posted online, ostensibly to compel tool developers to remedy perceived flaws. However, these reviews simultaneously provide circumvention strategies to unsuspecting self-bound users. This causes a problem discovered by one user to quickly become a problem for many users. Further, these circumvention strategies are potentially innumerable (see subsection 3.1) and are not always remedied or able to be remedied.

3.3 INABILITY TO ALLOW LEGITIMATE OVERRIDES

Ulysses nods to his crew when the ship is out of earshot of the sirens. His companions recognize that the danger has passed, remove the wax from their ears, and loosen Ulysses' ropes.

Yet digital self-control tools cannot recognize when previously imposed self-binding restrictions should be legitimately overridden. This creates two related difficulties: a user may be unable to satisfy a legitimate need to override a restriction during the binding period, or the tool may become prohibitively difficult to uninstall. Both of these issues stem from the relative inability of the digital self-control tool to divine legitimate desire.

This deficiency is captured by Arendt's statement about technology and action [8]: "Violence can be justifiable, but it never will be legitimate." Arendt describes *legitimacy* as the inherent respect afforded to democratic human action. In other words, the inability of DSCTs to allow legitimate user overrides may be considered not merely a technical problem but a mark of the inherent inability of DSCTs to give or receive respect.

3.4 INSTABILITY

The mast to which Ulysses is tied is presented as a firm platform: this is necessary if his bonds are to remain secure.

Yet the systems upon which digital self-control tools rely are inherently unstable. Tool rights are not self-contained and must instead rely on frameworks set by operating systems or app stores. Tools may fail due to changes in the interfaces of the apps that they limit. Tool upgrades may also introduce unintentional external bugs. These uncertain qualities cause self-control tools to bind with less security than Ulysses' ropes. The practical consequence of this inherent reliance on external systems is that DSCTs must take on increased risk. This risk may be passed to users in varying forms, including, among others, higher tool prices, greater likelihood of tool failure, or diminished tool capabilities.

3.5 PRESSURING OF USERS DUE TO OTHER EMBODIED DESIRES

Ulysses' ropes were meant for one purpose: to bind him to the mast of a ship.

Yet digital self-control tools do not have a sole purpose: rather, they embody the combined desires of tool users, tool designers, platform owners, and designers of restricted apps [cf. 1]. Even when DSCTs function as intended (cf. subsection 3.4), they are inherently subject to compromise on conflicts related to efficacy, privacy, payment, and advertising. Winner's statement about the concretization of political relations [9] appears prescient: "Certain technologies in themselves have political properties." In other words, self-control tools are not only a form of self-control: they are inescapably a form of control by others as well.

4 FURTHER IMPLICATIONS

A corollary of subsection 3.2 is that users of digital self-control tools must maintain the minimal self-discipline required to avoid seeking out circumvention strategies. The role of the digital self-control tool is simply to make long-term desires more prominent in the short-term. These tools cannot govern user behavior.

The inability of digital self-control tools to distinguish between legitimate and illegitimate overrides (see subsection 3.3) may be partially ameliorated by including other individuals through "digital group-control" (binding an entire social community) or "digital other-control" (parental control, password safekeeping). However, including other individuals does not necessarily ensure that detection or prevention of circumventions will be improved (see subsection 3.2).

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