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How Social Media Platforms Engineer

User Behaviour Through Design

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Abstract

This thesis investigates how social media platforms engineer user behaviour through deliberate design choices, situating these practices within the broader context of the attention economy. While scholarship has traced the commodification of attention across newspapers, radio, and television, fewer studies have systematically examined the micro-level design features that structure everyday digital interactions. Using a qualitative content analysis of 152 features across Instagram, TikTok, and X (formerly Twitter), this research categorises interface elements through the Behaviour Change Technique Taxonomy (BCTTv1), the Fogg Behaviour Model (FBM), and the literature on dark patterns. Findings reveal four dominant dynamics: cross-platform convergence, the prioritisation of short-form video, the ubiquity of re-engagement triggers, and the expansion of the social graph. By bridging economic, psychological, and ethical perspectives, this thesis contributes a granular, design-level analysis that addresses gaps in existing literature and demonstrates how platform architectures operationalise the logics of the attention economy. The study concludes by reflecting on the emerging impact of artificial intelligence - while AI is not the primary focus of this research, its inevitable role in shaping future platform design is acknowledged, alongside the ethical stakes of persuasive technology and the urgent need for regulatory and design interventions.

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1. Introduction

Friends. FarmVille. The Wall. Pokes. Status updates.

For those who came of age in the late 2000s, these terms evoke the cultural moment of an early "blue website" that defined online sociality: Facebook. As dramatized in David Fincher's *The Social Network* (2010), the platform initially presented itself as a digital town square, a space for connection and community. Yet in 2025, the term *"social network"* barely captures what Facebook and its successors—Instagram, TikTok, and X (formerly Twitter)—have become. No longer confined to facilitating communication, these platforms have expanded into complex behavioural infrastructures.

Over time, the shift from connecting people to monopolising their attention has quietly redefined digital culture. Status updates evolved into infinite scroll; pokes gave way to streaks; "staying in touch" became "staying online." Each design pivot—notifications that ping at just the right moment, videos that autoplay without consent, visible like-counters that transform communication into a metrics race have all contributed in transforming users from participants in a digital community into resources to be mined for engagement.

What changed? How did we get here? What keeps us coming back even when we don't intend to? The signs came in small shifts. Facebook's introduction of the News Feed in 2006 redefined social interaction by privileging algorithmically ordered visibility over chronological updates. Twitter's adoption of algorithmic curation in 2009 entrenched this shift, making relevance—rather than recency—the organising principle of information flow. Instagram's launch of Stories in 2016 demonstrated that even dominant platforms would freely replicate competitors' most engaging features if they promised to capture more user attention.

The broader consequences of these shifts have not gone unnoticed. Researchers and policymakers alike have interrogated the role of algorithms in driving polarisation (Tufekci, 2015), the spread of misinformation during global crises such as the COVID-19 pandemic (Cinelli et al., 2020), and surveillance practices that trade privacy for profit (Zuboff, 2019). Revelations like the Cambridge Analytica scandal in 2018, where Facebook data on 87 million users was harvested without consent for political targeting (Cadwalladr & Graham-Harrison, 2018), or Frances Haugen's 2021 disclosures about Instagram's internal research on teen mental health harms (Dwoskin & Horwitz, 2021), have underscored the human costs of an engagement-driven business model. By 2025, these concerns have translated into growing regulatory scrutiny, with the European Union's Digital Services Act (2022) and continuing U.S. congressional hearings on platform monopolies and content moderation.

The public discourse on social media platforms have tended to focus on visible outcomes—misinformation, algorithmic amplification, privacy violation, all critical discussions that need to be had, without a doubt. This thesis however, turns to a comparatively overlooked dimension: the intentional design choices that structure how users behave online. By situating behavioural features within the literature on the attention economy (Simon, 1971; Davenport & Beck, 2001; Wu, 2017), persuasive design (Fogg, 2009), and surveillance capitalism (Zuboff, 2019), this work investigates how platforms systematically engineer habits, shape cognition, and reinforce engagement.

2.Literature Review

This literature review will aim to examine the foundations of the attention economy and how its business model has produced a systematic strategy of engineering user behaviour. It traces the historical and economic logic that treats attention as a scarce, monetisable resource, and

explores how contemporary platforms operationalise this logic through interface design and algorithmic personalisation.

2.1 Foundations of the Attention Economy: From the Penny Press to Prime Time

The attention economy refers to an economic system where human attention is treated as a scarce and valuable commodity that media and technology platforms compete for (Davenport, T. H., & Beck, J. C., 2001).

The term was first introduced by economist Herbert Simon in 1971, who observed that in a world overflowing with information, attention becomes the limiting factor:

> *"In an information-rich world, the wealth of information means a dearth of something else: a scarcity of whatever it is that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it."*

Simon's insight laid the groundwork for what would become a defining logic of digital capitalism. As the internet expanded, scholars like Michael Goldhaber (1997) extended this idea to the Web itself, arguing that attention—not information—is the true currency of the digital age:

> *"If the Web and the Net can be viewed as spaces in which we will increasingly live our lives, the economic laws we will live under have to be natural to this new space. These laws turn out to be quite different from what the old economics teaches, or what rubrics such as 'the information age' suggest. What counts most is what is most scarce now, namely attention."*

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By the early 2000s, this logic had entered the business world. Thomas H. Davenport and John C. Beck (2001) framed attention as not only an economic unit but a strategic priority, asserting that understanding and managing attention would become the most important determinant of businesses' success.

Tim Wu (2017), in *The Attention Merchants*, demonstrates that the monetisation of human attention is not a recent innovation but a recurring strategy across media industries. Nineteenth-century "penny press" publishers, for example, subsidised newspapers through advertising and boosted circulation with sensationalism, as in the *New York Sun*'s fabricated 1835 "Moon Hoax." McChesney (2015) identifies this as an early "crisis of journalism," where commercial pressures incentivised exaggeration to command scarce attention.

Even with advertising being a success in publishing, it didn't take to broadcast media right away with radio initially framed as a public service. That was until the success of *Amos 'n' Andy*, a radio show which integrated advertising into entertainment and attracted tens of millions of listeners, demonstrating that audience attention could be seamlessly merged with promotional content.

Television inherited and amplified this logic, with audience measurement systems like Nielsen ratings emerging as central tools in monetising attention. This pricing logic codified attention as currency: measured audience size and composition determined spot rates and scheduling decisions, aligning programming incentives directly with sustained viewership.

As Gensch and Shaman (1980) observe, "millions of dollars are at stake because advertising rates, particularly spot television rates, are a direct function of network ratings." These metrics not only influenced advertising costs but also determined which programs remained on air. Hartigen and Kleiner (1984) similarly note that in commercial television, revenue is "priced by the number of homes reached," meaning that "the income of a station or network is directly

determined by the popularity of its shows." In this model, attention itself becomes the currency—viewership metrics stand in for economic value, reinforcing the idea that the true commodity is not the content, but the audience's sustained gaze. One of the most popular examples of this playing out in pop culture was the cancellation of *Firefly* (2002) despite critical acclaim illustrates how networks valued ratings over creative merit (Lotz, 2007; Johnson, 2012).

These developments show both continuity and change. Each media generation refined its ability to commodify attention, yet broadcast-era techniques remained aggregate and approximate.

2.2 Social Media: The Second Wave of Attention Economy

If its predecessors commodified attention in aggregate, social media platforms mark a decisive transformation, converting attention into a programmable asset, engineered through algorithmic curation, real-time telemetry, and adaptive interfaces at global scale.

Unlike static broadcast programming, algorithmic recommender systems continuously adapt to user signals and actively shape behaviour, producing feedback loops that "hook" users into extended engagement (Seaver, 2019). This capacity constitutes a structural break with earlier advertising models, shifting from the sale of audiences in bulk to the dynamic engineering of individual attention.

The commercial imperative remains familiar—longer sessions translate into greater advertising revenue. Platforms like Facebook, TikTok, and YouTube absorb behavioural data in real time and use it to decide "what comes next," ensuring that the path of least resistance is continued use (CNET, 2018). Recommendation engines drive more than 70% of YouTube watch time, while TikTok's "For You" feed has become a paradigmatic case of algorithmic immersion, associated with session lengths exceeding one hour (DataReportal, 2025).

The scale at which this occurs is unprecedented. As of July 2025, 5.41 billion identities—roughly two-thirds of the global population—engage with social platforms monthly, averaging 2 hours 21 minutes of daily use across nearly seven different platforms (DataReportal, 2025; Smart Insights, 2025). This volume multiplies exposure to engagement-maximising mechanics and makes opting out socially and professionally difficult.

Emerging research shows that algorithmic design does more than extend usage; it shapes what kinds of content proliferate. For instance, Meta's 2021 "Meaningful Social Interactions" update sought to prioritise friend and family content, but internal research revealed it amplified divisive material because anger-inducing posts generated stronger engagement (Horwitz & Seetharaman, 2021). Similarly, TikTok's algorithm has been criticised for reinforcing gendered stereotypes and promoting harmful body-image content disproportionately affecting young women (Abidin, 2022). Guillaume Chaslot, a former YouTube engineer and founder of AlgoTransparency reveals how platform incentives favor time-on-platform over quality:

"So the incentive is not to produce better-quality content, content that will help people, but content that will help them spend more time online" (KQED, 2018).

These examples demonstrate that optimisation for engagement often collides with user wellbeing.

The most at risk are the youth, with U.S. teens average 4.8 hours per day on social apps, with higher-use cohorts reporting substantially worse mental health (WHO Europe, 2024). Intersectional studies suggest disparities: girls report stronger correlations between compulsive use and anxiety, while users from lower socioeconomic backgrounds are more vulnerable to addictive dynamics due to fewer alternative leisure opportunities (Twenge & Martin, 2020; Orben, 2020).

Critics emphasise the concentration of design power in a small cadre of engineers. Tristan Harris, former design ethicist at Google, and now the co-founder of Center for Human Technology argues how a relatively small cadre of designers can shape what billions think about and when they think it through defaults, notifications, and ranking architectures.

> *"Never before in history have 50 designers—20- to 35-year-old white guys in California—made decisions that would have an impact on two billion people… who will have thoughts they didn't intend to have because a designer at Google said, 'This is how notifications work on that screen'."*

Yet this claim requires contextualisation: while Harris highlights the asymmetry of design control, recent scholarship stresses that user responses are mediated by local cultures, regulations, and counter-practices (Couldry & Mejias, 2019). Thus, agency is constrained but not eliminated, complicating a purely deterministic account.

Conceptualising platforms as a "true attention economy" (Heitmayer, 2025) foregrounds how attention itself becomes a tradable unit embedded in infrastructure. Every interaction is captured, auctioned, and redirected into predictive models, converting micro-moments into durable revenue streams. As Hayes (2025) observes, attention is now sliced into "tiny slivers of time" sold in programmatic markets. Yet some scholars argue this framing is incomplete: Zuboff (2019) suggests that what is ultimately extracted is not attention but behavioural surplus—predictable patterns of action—implying a shift from holding the gaze to producing behaviour.

These dynamics reveal both continuity and rupture. Like earlier media, platforms monetise attention to fund advertising. But unlike their predecessors, they operationalise it through data-driven architectures that not only capture but condition behaviour, raising sharper questions about agency, autonomy, and distributive impact.

2.3 Understanding the relationship between Attention Economy and Behavioural Design

In the preceding section, the concept of the "attention economy" naturally bled into discussions of algorithmic amplification, personalized feeds, behavioural engineering, and such. While this overlap is analytically logical—since both frameworks address how platforms vie for and manipulate user focus—it also risks conflating two distinct, albeit interconnected, ways of understanding social media's power.

The attention economy frames attention as a scarce, valuable resource to be captured and monetised. Yet, some scholars have begun to question whether attention itself remains the most useful or economically salient unit for understanding platform capitalism. Daniel Black (2024), for instance, introduces a different perspective by arguing that platforms are ultimately less invested in attention for its own sake than in the orchestration and modification of behaviour. While attention may be one mode of entry, its economic value derives from how it channels users into measurable, optimisable patterns of action. In this reframing, attention becomes instrumental—a gateway to the real asset of predictive, modifiable behaviour. Black contends that what platforms ultimately extract is not just the user's gaze or focus, but their series of actions, tendencies, and predictable future responses.

In my view, the pursuit of attention at all costs has fundamentally altered how media environments are designed. While the attention economy sets the structural and commercial imperative, behavioural design provides the toolbox for fulfilling it (Zuboff, 2019). The two are intrinsically connected: the economic incentive to capture attention shapes design priorities, while innovations in behavioural engineering reshape the contours of the attention economy itself.

This relationship becomes clearer when we examine how behavioural principles are translated into concrete design interventions.

Grounded in behavioral psychology and cognitive science (Skinner B.F, 1989, Thaler, R. H., & Sunstein, C. R. 2008), behavioural design refers to the deliberate engineering of environments (features, cues etc.) to elicit specific user responses. A well-known example of behaviour design is the fly-in-the urinal intervention at Amsterdam's Schiphol Airport in the early 1990s. To reduce spillage in men's toilets, cleaning staff etched small images of flies into the urinals—providing users with a subtle, intuitive target. The intervention worked because most individuals instinctively aimed at the image, improving cleanliness without the need for signage or enforcement. Households which regularly received a letter comparing their own energy consumption to that of similar neighbors reduced their consumption by an average of 2%. Countries with presumed-consent laws—where individuals are organ donors by default—have donor registration rates nearly 60 percentage points higher than countries with explicit-consent (opt-in) systems. These examples demonstrate that subtle cues can shape behaviour in physical environments.

Digital interfaces take this behavioural toolkit to another level through what B.J. Fogg terms "persuasive technology"—interactive systems deliberately engineered to change users' attitudes or actions. Also known as captology, this concept was introduced by Fogg when he founded the Stanford Persuasive Technology Lab (now the Behavior Design Lab) in 1998 to study and systematically experiment with how computers, apps, and interactive platforms could be designed to influence users' actions and decisions.

Within the persuasive technology framework, designers aim to elicit specific behaviors by aligning three elements at the moment of action—motivation, ability, and a well-timed prompt—an approach formalized in Fogg's programmatic work and operationalized via rapid,

iterative design that targets small, tractable behaviors and scales from proven "tiny successes" (Fogg, 2009). Unlike offline nudges that are static and context-bound, persuasive technologies operate in real-time, global scale: they can A/B-test thousands of micro-interventions per day, personalise prompts in real time, and iteratively refine tactics based on algorithmic learning.

Contemporary social platforms embed this logic in interface patterns such as infinite scroll and autoplay: by removing effort and stopping cues (increasing ability), sequencing continuous, variably rewarding content (sustaining motivation), and using the interface itself as a standing prompt at transition points (e.g., the end of a clip), these features make "one more" action the path of least resistance.

2.4 Persuasive Technology, Criticism, and Ethical Debate

B. J. Fogg's early work at Stanford on "captology" inaugurated a systematic framework for understanding how digital environments could influence user actions. His Behaviour Model (FBM) articulated how behaviour emerges when motivation, ability, and a trigger converge at the right moment. This framework was influential not only in academia but also in industry, as many of Fogg's students went on to found or shape major platforms such as Instagram and Clubhouse. While this transfer of theory into practice demonstrates the practical utility of his ideas, it also reveals potential conflicts of interest. Scholars argue that the commercial uptake of persuasive design often prioritised rapid user growth and monetisation over user welfare, reflecting a bias embedded in the research-to-industry pipeline (Samrai, 2007). Thus, while the FBM remains a valuable conceptual tool, its legacy cannot be separated from its entanglement with Silicon Valley's growth-driven ethos.

Critics contend that Fogg's blueprint was quickly weaponised to build platforms designed for addiction, distraction, and psychological exploitation.

Offering a pointed critique, Yasmin Samrai writes in the Stanford Review: "the projects from the 2007 cohort were not works of genius – the most popular app allowed users to send 'hotness' points to their Facebook friends – but they got people hooked. In the space of ten weeks, they collectively gained 16 million users and made $1 million dollars in advertising revenue," underscoring how the behavioural design techniques taught at the lab were quickly translated into highly effective mechanisms for capturing user attention and generating revenue.

Human–computer interaction (HCI) scholarship has since documented how these logics translate into interface patterns: asymmetric friction (easy opt-in, difficult opt-out), attention loops (infinite scroll, autoplay), and salience cues (push notifications), all of which systematically shape behaviour toward platform goals rather than user welfare (Colin et al., 2018; Kollmer et al., 2023). Brignull et al. (2023) describe such tactics as "deceptive patterns," highlighting how nudges can shade into coercion when transparency and informed consent are absent.

At a systemic level, these micro-mechanisms consolidate into what Zuboff (2019) calls *instrumentarian power*. In this configuration, platforms not only monitor but actively shape behaviour through architectures of choice—defaults, recommendations, notification regimes—rendering users both legible and malleable. Zuboff's reframing moves beyond the cliché that "if it's free, you are the product," arguing instead that users are the raw material from which behavioural surplus is extracted with this chilling quote: *"You are not the product; you are the abandoned carcass—the product derives from the surplus that is ripped from your life,"*

This perspective highlights a deeper commodification: what is bought and sold is not simply attention, but predictive behavioural data that can be continuously resold, optimised, and operationalised.

From an ethical standpoint, the central dilemma arises from the intentional engineering of addictive environments. Former Facebook executive Tim Kendall described the company's monetisation strategy as directly modelled on Big Tobacco, where incendiary or extreme content reliably maximised engagement and profits (U.S. Congress, 2020). Empirical studies echo these concerns, showing correlations between compulsive social media use and diminished wellbeing, particularly among youth (Hou et al., 2019; Kuss et al., 2017). Internal Facebook documents have further revealed that engagement-driven recommendation systems directly amplified divisive content, with 64% of extremist group joins linked to algorithmic suggestions (Lauer, 2021). These findings suggest that harms are not accidental byproducts but structural features of engagement-maximising design.

Yet this critique risks presenting a one-sided picture if ethical debates are framed exclusively in terms of exploitation. Persuasive design is not inherently malign; its applications vary by context. In healthcare, personalised nudges have been harnessed to promote medication adherence, smoking cessation, and even digital mental health support (Hollis et al., 2019; Yardley et al., 2016). Apps such as Headspace and Woebot apply adaptive feedback loops to encourage healthier behaviours and reduce stress, demonstrating that the same persuasive logics can be mobilised for public benefit. This raises a critical question: is persuasive technology irredeemably tied to exploitative business models, or can it be ethically recalibrated under different institutional and regulatory arrangements?

A related debate centres on user autonomy and agency. Much literature portrays users as passive subjects of manipulation, yet studies of digital resistance complicate this view. Users adopt coping strategies such as ad-blockers, selective muting, or digital detox practices, which demonstrate that platform influence is powerful but not absolute (Light et al., 2018). Moreover, cultural and socioeconomic contexts mediate how persuasive features are received. For example, adolescents from lower socioeconomic backgrounds may be more vulnerable to

compulsive use due to limited leisure alternatives, while young women disproportionately report negative body image outcomes from personalised feeds (Twenge & Martin, 2020; Orben, 2020). Intersectional perspectives thus highlight that harms are unevenly distributed and cannot be generalised across all users.

The rise of generative AI introduces a further ethical wrinkle. Harari et al. (2023) warn that AI systems capable of manipulating language and imagery with "superhuman efficiency" could create environments in which cognitive autonomy itself is undermined. Hansen (2024) extends this concern by introducing the notion of *cognitive lock-ins*, where dependence on AI-driven platforms creates deeper forms of dependency than attention capture alone, making it difficult for users to replicate cognitive processes without the technology. These developments suggest that persuasive design is evolving from shaping attention to restructuring cognition, intensifying the ethical stakes.

In light of these dynamics, reform efforts warrant careful consideration. Technical interventions such as Apple's "Screen Time" dashboards and TikTok's daily limit prompts, along with regulatory initiatives like the EU's Digital Services Act, illustrate that persuasive features can be recalibrated toward user welfare. Critics argue, however, that such measures remain superficial compared to the deeper incentive structures that prioritise engagement maximisation (Bhargava & Velasquez, 2021). Nonetheless, their existence signals that design logics are not immutable and can be contested through policy, culture, and design innovation.

In summation, the literature portrays persuasive technology as a deeply ambivalent force. On the one hand, its current operationalisation within commercial social media platforms produces structural harms, undermining autonomy, wellbeing, and civic life. On the other hand, its theoretical framework remains ethically neutral and has demonstrated potential for positive application when incentives are aligned differently. The challenge, therefore, is not simply to

reject persuasive technology, but to interrogate the conditions under which it is deployed, the incentives that drive it, and the governance structures that might redirect its power toward human flourishing rather than exploitation.

2.5 Gaps in Literature Review & Research Agenda

The reviewed scholarship demonstrates that the commodification of attention is neither novel nor incidental, but the continuation of a longer historical trajectory stretching from the penny press to contemporary platform capitalism. Scholars have convincingly shown how attention functions as an economic resource (Simon, 1971; Davenport & Beck, 2001), how media industries have progressively refined techniques to capture and monetise it (Wu, 2017), and how persuasive design translates these imperatives into behavioural architectures (Fogg, 2009; Zuboff, 2019). Ethical critiques highlight the consequences of these practices for autonomy, wellbeing, and democratic culture (Bhargava & Velasquez, 2021; Nussbaum, 2011). While this body of work provides a rich conceptual foundation, there are notable limitations that justify further investigation.

First, much of the existing literature conceptualises the attention economy at a macro level, emphasising economic logics, historical trajectories, and business models. This leaves comparatively less systematic analysis of the *micro-level design features*—notifications, story rings, infinite scroll—that operationalise these logics in everyday user interaction. While individual scholars and journalists have highlighted particular mechanisms (Alter, 2017; Harris, 2017), there is a lack of structured, feature-level cataloguing that connects design interventions to psychological mechanisms.

Second, empirical studies of social media harms often adopt aggregate measures (time-on-platform, self-reported well-being) rather than examining the specific design

architectures that produce such outcomes. This risks conflating correlation with causation: heavy use may correlate with poorer wellbeing, but the precise role of persuasive features remains under-specified. A systematic coding of design features can illuminate how attention is converted into measurable, repeatable actions.

Third, ethical critiques of persuasive technology are well developed in normative theory but they rarely engage with the granular mechanics of design. Discussions of autonomy, manipulation, and behavioural surplus remain largely conceptual, with limited empirical grounding in how particular features embed coercive nudges or deceptive patterns. Bridging this gap requires linking ethical frameworks directly to design-level analysis.

Finally, comparative analyses across platforms are limited. While studies of Facebook, YouTube, or TikTok exist in isolation, few attempt to systematically compare how different platforms deploy parallel design strategies under the same economic imperatives.

This thesis responds to these gaps by thoroughly examining three major social media platforms—Instagram, TikTok, and X—through a systematic catalogue of approximately 152 features. This approach allows the study to move beyond macro-level generalisations toward a micro-level understanding of how specific design architectures function as instruments of behavioural engineering. In doing so, it aims to contribute a more precise account of how the attention economy is operationalised in practice, and to foreground design as the critical site where economic imperatives, psychological mechanisms, and ethical stakes converge.

3. Methodology

This study investigates the research question: ***"Do social media platforms engineer user behaviour through design?"*** Two sub-questions guide the inquiry:

1. How do interface features on platforms such as Instagram, TikTok, and X shape user behaviour?

2. What psychological mechanisms underpin these design choices?

To answer these questions, I employed a **qualitative content analysis** of social media features, treating them as design artefacts that can be documented, coded, and interpreted. This approach allowed me to move from descriptive analysis of features to interpretive insights about behavioural mechanisms, before finally evaluating them against ethical frameworks. The methodology combines three lenses: the Behaviour Change Technique Taxonomy v1 (BCTTv1) (Michie et al., 2013), the Fogg Behaviour Model (FBM) (Fogg, 2009), and literature on dark patterns (Gray et al., 2018).

The choice of these analytical frameworks was guided by the central aim of this study: to investigate how social media platforms engineer user behaviour through design. In order to capture the mechanisms embedded in platform features, I required tools that could both categorise behavioural interventions and account for their psychological underpinnings.

The **Behaviour Change Technique Taxonomy v1 (BCTTv1)** was selected as the primary framework because it provides a systematic, internationally recognised method for specifying the "active ingredients" of behaviour change interventions (Michie et al., 2013). Originally developed to improve the accuracy and replicability of health behaviour interventions such as smoking cessation or physical activity programmes, the taxonomy breaks interventions down into small, irreducible components—such as goal setting, prompts, or self-monitoring—that are

designed to bring about behavioural change. In this study, I treated platform design choices as analogous to behaviour change interventions, in that they are intentionally constructed elements that aim to modify user behaviour. This conceptual alignment made BCTTv1 a natural fit: platform features could be specified and coded in the same way as intervention components, thereby satisfying the taxonomy's criteria. The framework also offered an added advantage of **replicability**, since future researchers can apply the same taxonomy to new or evolving features in a consistent way.

While BCTTv1 enabled systematic categorisation, it did not fully explain **why** certain features exerted influence.

To address this, I employed the **Fogg Behaviour Model (FBM)** (Fogg, 2009), a framework developed specifically for persuasive technology. FBM posits that behaviour occurs when three elements converge: motivation, ability, and a prompt. Many of the most widely used social media features—from autoplay to streak counters—map neatly onto this structure, lowering barriers to action (ability), exploiting emotional or social triggers (motivation), and embedding timely cues (prompts). The model's origin in the Persuasive Technology Lab at Stanford is particularly relevant, as the same design logic underpins the contemporary platforms examined here. In this study, FBM thus complemented BCTTv1 by providing a psychological account of the mechanisms through which platform features achieve their behavioural effects.

Finally, I incorporated the lens of **dark patterns** (Gray et al., 2018) as a supplementary category for features that could not be meaningfully coded under either BCTTv1 or FBM. While both frameworks presume interventions are directed toward user goals or welfare, certain platform designs operate coercively, constraining rather than enabling user choice. Features such as infinite scroll, obstructive account deletion flows, or asymmetric follow friction do not align with BCT labels but clearly exert behavioural force. Rather than forcing these into an ill-fitting

taxonomy, I treated them as dark patterns: designs that manipulate user behaviour in ways that primarily serve the platform's commercial interests. Dark patterns were therefore not a central analytical lens but a necessary residual category to capture features outside the scope of the behaviour change and persuasive technology frameworks.

3.1 Data Collection & Analysis

3.1.1 Data Collection

Data was collected from live applications of Instagram, TikTok, and X between July and August 2025, using a newly created test account to simulate typical user experiences. Approximately 152 features were catalogued, spanning macro-level affordances (likes, comments, reposts) and micro-level cues (notifications, stickers, templates).

All documentation and coding were conducted in Google Sheets, which allowed parallel development of two datasets: (1) a descriptive catalogue of features, and (2) a coded analysis.

3.1.2 Data Analysis

The analysis proceeded in two stages: **descriptive cataloguing** followed by **interpretive coding**. This sequencing allowed for a clear distinction between the neutral documentation of platform features and their subsequent classification through behavioural and ethical frameworks.

3.1.3 Descriptive Cataloguing

The first stage involved the creation of a structured catalogue of features across Instagram, TikTok, and X. Each entry included the product name, a unique feature ID for reference, and a

concise description. The focus was on neutrality: features were documented in terms of what they are and what they do, without premature interpretation. For instance, Instagram's story ring was recorded as "A red ring highlights new or unseen stories at the top of the feed."

The cataloguing was conducted app by app but iteratively refined: when a feature on one platform revealed a parallel or overlooked element on another, the earlier catalogue was updated. After repeated cycles of observation, the dataset stabilised at approximately **152 features**, at which point further observation produced diminishing returns. This "saturation point" was deemed sufficient to capture the breadth of design mechanisms at play.

3.1.4 Interpretive Coding

The second stage moved from description to interpretation by classifying each feature against the **Behaviour Change Technique Taxonomy v1 (BCTTv1), the Fogg Behaviour Model (FBM), and,** where necessary, the literature on **dark patterns.**

BCTTv1 provided the backbone of the coding process **-** each feature was matched to the closest behaviour change technique, with secondary codes applied where appropriate. For example, Instagram's story ring was coded as *BCT 7.1 Prompts/cues*, since it visually signals an unfinished task and encourages users to click. A secondary code of *restructuring the environment* was also applied, since the dedicated story space functions as a digital analogue to environmental modification in physical settings. Likewise, the **direct message forwarding counter** was coded as *BCT 6.2 Social comparison*, with a secondary label of *6.3 Information about others' approval*. This dual coding approach provided greater granularity and reduced the risk of forcing features into a single category. Each decision was accompanied by a brief justification note, ensuring transparency in how coding judgments were made.

The **Fogg Behaviour Model (FBM)** was used as a complementary psychological lens on certain features but did not drive the analysis in its entirety.

3.2 Sample Codebook

The first codebook (titled "Descriptive Feature Catalogue") (*Fig. 1*) served as a descriptive catalogue, documenting raw feature details in a neutral language.

Product	Feature ID	Feature Name	Feature Description
Insta... ▼	IG-034	Memories	Reminders of past posts on their anniversaries.
TikTok ▼	TT-025	STEM tab	Dedicated section for science, tech, engineering, math content.
X (Tw... ▼	X-005	GIF Comments	Animated images in replies.

Fig. 1 - A sample list of features from the codebook "Descriptive Feature Catalogue".

The second codebook (titled "Coded Feature Catalogue") (*Fig. 2*) served as the coded analysis sheet, where features were systematically classified using the Behaviour Change Technique Taxonomy (BCTTv1), the Fogg Behaviour Model (FBM), and dark pattern categories. [Full Table in Appendix A and Appendix B].

Product	Feature ID	Feature Name	Category	BCT (Primary)	BCT (Secondary)	BCT Justification	FBM – Behaviour (B)	FBM - Motivation	FBM - Ability	FBM - Prompt
Instag... ▼ IG-012		Counters on Messages & Notifications	Return & Re-eng	7.1 Prompts/cues	7.2 Cue Signalling Reward	The unread dot acts as a discriminative cue, signalling to the user that opening the message may result in a (potentially rewarding) social interaction.	Check DMs/notifications	Hope/... Pleasu... ▼	Time Physical Effort Brain Cycles Social Deviance Money Routine ▼	Signal ... ▼
X (Twi... ▼ X-039		Pinned Tweets from Accounts you follow	Return & Re-eng	7.1 Prompts/cues		Showcase additional tweets to get users to engage	Click on the suggest pinned tweet	Social ... ▼	Time Physical Effort Brain Cycles Social Deviance Money Routine ▼	Signal ... ▼
TikTok ▼ TT-050		Select Templates	Creation & Co-cr	6.2 Social Comparison	3.1 Social support (unspecified)	Draws attention to the contributions of others, allowing users to compare their own posts and add to its growing collection of responses.	Respond to chain prompt	Social ... Pleasu... ▼	Time Physical Effort Brain Cycles Social Deviance Money Routine ▼	Signal ... ▼

Fig. 2 - A sample list of features from the codebook "Coded Feature Catalogue".

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3.3 Ethical Considerations

This research involved no human subjects and thus carried minimal ethical risk. All data were collected from publicly accessible app interfaces, without recording personal user information. Nevertheless, the ethics of analysis were foregrounded. Classifying features as dark patterns involved evaluating their impact on user autonomy, drawing on Nussbaum's capabilities approach as an ethical lens. Features that undermined users' ability to exercise reasoning, self-control, or wellbeing were considered objectionable, while those enabling safety or reflection were noted as positive.

3.4 Limitations

The study has notable limitations which must be acknowledged. The analysis relied on solo-coding which introduces subjectivity. Only mobile apps were examined, excluding web interfaces that may differ in design. The study represents a snapshot of July–August 2025; given the rapid evolution of platform design, findings may become outdated. The dataset, though substantial at 152 features, is not exhaustive and may reflect selection bias toward prominent features. Finally, no user interviews or behavioural data were collected, meaning conclusions about impact remain inferential rather than experiential.

4. Findings

The research set out to investigate how social media platforms engineer user behavior through deliberate design choices to increase engagement. The findings, drawn from a detailed study of the platform interface reveals the following:

4.1 Finding #1 - Cross-Platform Convergence

In the findings, a total of 152 features across Instagram (55), TikTok (56), and X (41) were observed. Of these, 24 features were the same across all three platforms. If we extend the comparison to just Instagram and TikTok, that number goes up to 32 features, clearly demonstrating a pattern of convergence of features.

A clear example is Instagram's launch of Stories in 2016, directly modeled after Snapchat's feature of the same name, which lowered adoption barriers by leaning on user familiarity. Instagram's rollout of Reels after TikTok's success with short-form video illustrates how platforms accelerate diffusion in a market where innovation cycles are further shortened by rapid adoption of successful features.

For example, 'Pull to Refresh' across all platforms uses gesture control to reinforce checking behaviors, justified as habit formation (BCT 8.3), motivating users via anticipation of new content and requiring minimal brain cycles or effort. Similarly, the double-tap to 'like' a post is another gesture-based control that conditions users to provide feedback with minimal friction, embedding gratification into simple, repeatable actions. These gesture controls are standardized with the platforms recognizing that their users routinely switch between competing apps, making it essential to minimize cognitive load by adopting familiar intuitive interactions, just as universal shortcuts like copy and paste is always Ctrl+C/Ctrl+V (or ⌘C/⌘V).

The dataset reveals that the most widely adopted features cluster into two themes: re-engagement mechanics and social validation drivers. Return triggers, such as push notifications, unread counters are engineered to seamlessly draw users back and instill habitual app use. Simultaneously, social influence mechanisms—including likes, comments, tagging, friend suggestions, and real-time status indicators—capitalize on users' needs for approval, thus

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continuously fueling participation and network expansion, underscoring why digital platforms converge on.

Another prime illustration of this broader trend of platform convergence lies in the realm of account management, where deactivation and deletion processes have evolved to exhibit remarkable similarities.

Typically, the process begins with deactivation as a reversible step rather than immediate deletion, creating a structured pathway that encourages reflection. Deletion or deactivation settings are rarely prominent on homepages or main menus, instead nested within multi-layered account settings, privacy tabs, or support sections, requiring users to navigate through several clicks or searches to access them. Platforms introduce additional steps to guide users thoughtfully, such as requiring password re-entry for verification, displaying warnings about potential data loss like posts, connections, or media, and suggesting 'helpful alternatives' to full deletion, including temporary deactivation or features to limit usage such as screen time reminders or quiet modes as proactive wellness-focused interventions. Once an account is deactivated, platforms generally provide an extended grace period, commonly around 30 days, during which the account remains in a suspended state, allowing for effortless reactivation simply by logging back in, with all data restored automatically and without additional hurdles, a user flow that has become a de facto standard.

4.2 Finding #2 - Emphasis on short-form video engagement

The dataset demonstrates a pronounced emphasis on short-form video engagement across the platforms. Instagram exhibits multiple features tailored to short-form videos via its Reels functionality, including a dedicated tab just for reels, which provides access to continuous, uninterrupted video playback, creating a flow state for the user. Additionally, the short-form

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content also takes up many tiles in the 'Explore' tab, clicking on any of which takes a user back to the Reels tab. Users may also see these Reels on their 'Home' feed, seamlessly integrating them into the core scrolling experience to boost discoverability and habitual viewing.

TikTok, as the pioneer of this format, centers its foundational architecture around short-form videos, with the default home tab serving as the 'For You' page that delivers continuous, uninterrupted playback.

The platform sets itself apart with distinctive innovations that remain unreplicated by competitors like Instagram and X. TikTok's full-screen mode exemplifies its commitment to an immersive, distraction-free viewing experience similar to YouTube, where videos automatically play in an edge-to-edge format that fills the entire device screen, mimicking a cinematic or television-like engagement to draw users into a seamless flow state of content consumption. This design choice minimizes cognitive interruptions, allowing for effortless swiping through endless streams of short-form videos, which enhances retention by fostering habitual scrolling and deeper immersion in diverse topics. The platform also offers a dedicated STEM feed, an optional tab accessible via settings that curates content focused on science, technology, engineering, and mathematics, often featuring educational videos from verified creators and partnerships with organizations like Common Sense Networks to ensure accuracy and quality. By prioritizing scientific and technical material—such as quick experiments, technology breakdowns, and mathematics puzzles—the STEM tab lends the platform greater credibility as more than just an entertainment hub, positioning it as a tool for informal learning and intellectual growth, which in turn gives users a rewarding sense of productivity and enlightenment amid their scrolling sessions.

Further enhancing thematic content discovery, TikTok's playlist feature enables users, while watching a video that belongs to a creator-curated series, to tap a "Playlist" button at the bottom

of the screen, which reveals the full list of related videos and allows seamless navigation to other similar entries in the playlist for continued engagement.

Perhaps the biggest signal that short-form videos are the way forward, earlier this year, X (Twitter), a platform once defined by its focus on text-based posts, has prioritised short-form video by launching a dedicated video tab, marking a significant shift, moving beyond simple video embeds to a platform structure that encourages continuous, algorithm-driven video consumption—reflecting industry trends set by TikTok and Instagram. The persistent placement of the video tab signals Twitter's intent to compete for attention in this competitive short-form video space.

It is also worth noting that except for the account management/deletion flow, every dark pattern that was identified in the research—whether it is legacy features like Auto-play and Infinite Scroll or newer design choices like swipe-based navigation, asymmetric follow friction have evolved to perfectly complement the short-form content strategy now dominating all major platforms—originally—designed to keep users on the platform longer, these features truly come into their own in a world packed with endless video clips.

4.3 Finding #3 - Nudges to return to the platform

The dataset reveals a substantial array of nudges engineered to prompt users to return to the platform, encompassing 37 features explicitly categorized under "Return & Re-engagement" across the three platforms: Instagram (15), TikTok (13), and X (9).

These features predominantly leverage prompts and cues (7.1 BCT) to trigger habitual check-ins, aligning with the Fogg Behavior Model (Fogg, 2009). For instance, push notifications appear universally, serving as external cues that interrupt daily routines to draw users back, signaling potential rewards like new interactions.

Instagram's return nudges exemplify a multifaceted approach, incorporating visual and interactive elements to foster habitual returns. Features such as the bright 'red circle' around Stories and the 'green circle' for close-friend Stories act as prominent on-screen highlights, drawing from *BCT 12.1 Restructuring the physical environment* to prioritize timely viewing. Counters on messages and notifications, along with suggested posts and "You may know" prompts, provide quantitative cues of unread content, aligning with *BCT 7.2 Cue signaling reward* by implying social or personalized value.

Real-time indicators like "....." (typing) and "Seen" in direct messages sustain engagement loops, while memories and event reminders nudge revisits to past content or upcoming activities. 'Pull to refresh' and the home button (refresh) enable effortless content reloading, reinforcing low-effort habits per FBM's ability component. Additional features like Notes, camera icons for instant photo sends, Ask Meta for in-app queries, and follow contacts from WhatsApp integrate seamless cross-app prompts, all categorized as signals that reduce friction for re-entry..

TikTok mirrors this emphasis on continuous engagement through an extensive suite of return triggers, many of which overlap with Instagram's strategies (Push Notifications, Red Circle around Stories, Message Indicators etc.) but are distinctly fine-tuned to deepen immersion and promote real-time participation.

For example, the "Join live" prompt is placed strategically under the search area, reducing friction for users to discover new craters and engage with ephemeral, live-streamed content. The Fogg Behavior Model highlights that timely prompts (or "triggers") are particularly effective when they appear in moments of high user motivation but low activation effort. TikTok leverages this by surfacing live and story posting prompts exactly when users are already exploring

content, maximizing the likelihood of immediate interaction—like the playlist button under a Reel that showcases more videos on the same theme that the user is already engaging with.

On X (Twitter), return nudges maintain the convergent pattern as Instagram and TikTok, but adapt to its text-and-multimedia focus. For example, "See *X* more tweets at the top" acts as a quantitative tease for unseen posts, similar to unread counters. Similarly, pinned tweets from accounts users follow act as personalized signals, continuously elevating highlighted content and providing recurring prompts for users to revisit discussions.

Just as Instagram integrates "Ask Meta" features to keep users exploring and interacting with AI-driven suggestions within the app, X (formerly Twitter) employs a parallel strategy through its "Ask Grok" icons and dedicated Ask Grok feature. These in-app AI prompts are purposefully woven into the Twitter experience to nudge users toward new interactions and surface relevant information, all without ever having to leave the platform. By positioning Ask Grok prompts directly on tweets, X ensures that curiosity and questions are addressed immediately and seamlessly, deepening engagement cycles and lowering thresholds for discovery.

4.4 Finding #4 - Increasing Social Graph

The dataset identifies 36 features explicitly oriented toward expanding users' social graphs across the three platforms: Instagram (12), TikTok (13), and X (11). These features, predominantly categorized under "Social Proof & Influence," leverage mechanisms like suggestions, tagging, and sharing to grow networks.

Instagram pursues social graph growth through a number of features that seamlessly embed network-building into daily use. Algorithmic recommendations like Suggested for You (New People to Follow) and Discover People surface tailored accounts, implying mutual relevance to encourage quick additions.

The 'Friends' tab within displays peer activities, sparking comparisons that motivate further connections while a real-time counter for Reposts and Sent as a Direct Message (#) enable sharing that highlights collective endorsements, inviting others to join conversations.

The platform also emphasizes co-participation with features like Tagging and Hashtags that even auto-complete suggestions reducing friction when engaging with other users. This is complemented by Collections, which is a private bookmark with another user, encouraging joint content curation.

Interactive stickers like polls, emoji sliders, quizzes, or countdowns solicit feedback, turning casual engagements into longer sessions. Face filters and Add Yours (Template) promote creative participation, where users compare and build upon others' contributions.

The platform is also always-on in increasing offline-on-online transitions with a QR Code feature that facilitates easy follows, while features like Post to WhatsApp Stories directly and 'Follow Contact on Instagram' when you share a link on WhatsApp bridge external networks, importing contacts from a platform in the same ecosystem (Meta) with minimal steps.

TikTok parallels Instagram's approach in expanding social graphs, sharing foundational tools like Likes, Comments, GIF Comments, Tagging (Mentions), Repost, Sent as a Direct Message (#), QR Code among others.

While Instagram optimises for personal connections, TikTok leans towards a creator audience with features like 'Who has viewed your profile?' that taps into mutual curiosity, and 'Total Likes' metrics right on the profile that puts a spotlight on content creation.

Message prompt Sticker ('It's been a while, say hi') reactivates lapsed ties, injecting prompts into chats. Duet Feature and Stitch Feature support remixes of existing videos, enabling collaborative chains that compare and connect creators.

X's conversation-centric platform leverages convergent strategies to drive engagement and expand its ecosystem, adapting features like Likes, Comments, GIF Comments, Tagging (Mentions), Reposts, and a "Discover People" function (akin to "Suggested for You") to prioritize discourse.

Communities unite users around shared interests, creating focused spaces for targeted support, knowledge exchange, and relationship-building, strengthening social ties. Engagement metrics, such as Views on a Post and Total Likes (Display), provide transparent feedback, motivating users to reciprocate through likes, comments, or reposts, thus sustaining interaction loops.

The Quote feature enables contextual reposting, sparking threaded discussions that invite new participants into the conversation, enhancing inclusivity and dialogue depth. Hashtags and Trending sections highlight viral topics, with auto-complete functionality streamlining participation in ongoing conversations, making it easier for users to join relevant discussions.

In August 2025, X introduced a prominent "View Quote" button, aligning with Behavior Change Technique (BCT) 12.5: Adding Objects to the Environment. This update reduced the previous two-click process to a single click, streamlining access to quote posts. By adding this intuitive digital cue, X lowered friction for users, encouraging exploration of quote-driven threads and facilitating the discovery of new users.

4.5 Dark Patterns

Dark patterns are design strategies that intentionally steer users toward outcomes that primarily benefit the platform—such as increased time-on-platform or reduced ability to disengage—often at the expense of user autonomy or wellbeing.

While the majority of features identified during analysis could be systematically coded using the Behaviour Change Technique Taxonomy (BCTTv1) and the Fogg Behaviour Model (FBM), a subset resisted classification within these behavioural frameworks. These features operated less as neutral prompts for behaviour change and more as coercive or manipulative interface designs—auto-play, infinite scroll, asymmetric follow friction, and obstructive account deletion flows. Unlike standard behavioural nudges, these features could not be understood as supporting user goals or enhancing motivation/ability within Fogg's model. Instead, they systematically limited user choice, reduced friction for engagement while increasing friction for exit, or embedded asymmetries that advantaged the platform.

By treating dark patterns as a distinct category, this study underscores an ethical fault line in design practice: the same persuasive logics that can support positive behaviour can also be weaponised to exploit cognitive vulnerabilities. Although not the central focus of the findings, isolating dark patterns provides an important supplementary insight. Their persistence across multiple platforms suggests that coercive design is not incidental but structurally embedded within the business logic of the attention economy.

In this sense, dark patterns function as a residual category that reveals the divergence between persuasive design as a neutral toolkit and its commercial appropriation as a mechanism of exploitation.

5. Analysis

The research question directs the inquiry toward the deliberate mechanisms embedded in platform interfaces, shifting focus from overt business models to subtle design choices that shape daily interactions. The findings reveal a landscape of engineered engagement, illustrating

how these elements serve as tools of instrumentation power (Zuboff, 2019). Several interconnected dynamics illustrate this process:

Cross-platform convergence standardizes low-friction interaction habits, making engagement nearly effortless across contexts. The rise of short-form video fosters immersive flow states that inhibit conscious disengagement. Nudges trigger habitual returns, embedding routines into users' daily lives. Meanwhile, the expansion of social graphs reinforces lock-in effects, pressing users to remain active to preserve their relational ties.

5.1 Feature Homogenisation

Turning first to the interpretive lens on cross-platform convergence, the empirical patterns of isomorphic feature adoption across Instagram, TikTok, and X reveal a strategic ecosystem dynamic where platforms homogenize designs to entrench user habits and secure competitive advantages in the attention economy. Everett Rogers' (2003) Diffusion of Innovations Theory frames this as a process of rapid imitation and adaptation, where persuasive elements proven to elevate metrics like daily active users spread through lowered familiarity barriers and accelerated innovation cycles via A/B testing, fostering seamless multi-platform engagement. This is complemented by DiMaggio and Powell's (1983) institutional isomorphism, particularly its mimetic form, which posits that uncertain market pressures drive platforms to replicate "legitimate" models for risk mitigation and credibility, culminating in a 'feature race' that standardizes low-friction interactions like gesture controls and re-engagement cues, thereby commodifying attention while subtly conditioning behaviors across digital landscapes.

From a business standpoint, Tim Wu (2016) highlights convergence as an inevitable market logic: once a particular format demonstrates its potency in harvesting attention, rival platforms cannot afford exclusion from that revenue stream. The rise of TikTok's short-form video (2017)

exemplifies this imperative, as its high-yield engagement model spurred rapid replication through Instagram Reels (2020), YouTube Shorts (2021), and, more recently, X/Twitter Video (2025), entrenching a homogenized content grammar that prioritises short-form video engagement. Similarly, the rapid diffusion of live audio features following Clubhouse's prominence in 2020—manifesting as Twitter Spaces (2021), LinkedIn Audio (2022), and Spotify Live (2021–23)—illustrates how platforms converge not on evidence of long-term sustainability, but based on the perceived competitive risk of being left behind.

The trajectory of e-commerce affordances within social media apps is yet another example of this cross-platform feature adoption: Douyin pioneered live shopping integrations in China as early as 2016, demonstrating their capacity to fuse entertainment and transactional flows. Meta was the first to transpose this model to Western markets through Instagram Shops in 2020, while TikTok subsequently internationalised its own commerce blueprint with TikTok Shop in 2021, followed closely by YouTube Shopping in 2022.

Nelson-Field (2023) positions this convergence as fundamentally advertising-driven, where the adoption of standardized formats reduces complexity for advertisers and streamlines both measurement and monetisation. By aligning on comparable units—impressions, view-through rates, watch-time—platforms reduce friction for advertisers seeking scalable, cross-channel campaigns.

Although the sequencing differs, the net effect is homogenisation: users now encounter near-identical environments across platforms. This not only incentivises design mimicry but also hardens a metric-driven logic where user experience is subordinated to advertiser legibility. The result is a feedback loop: platforms adopt commerce features proven elsewhere, advertisers reward their ubiquity with spend, and users are shepherded into predictable, replicable patterns of engagement across multiple apps.

The coded dataset of features such as story rings, infinite scroll, swipe gestures, and push reveal an underlying purpose of cognitive standardisation: the alignment of interaction elements across apps. As Instagram, TikTok, YouTube, and X increasingly replicate familiar cues—double-tap likes, vertical swipes, story circles—they cultivate a shared set of micro-routines that demand little conscious processing. Kahneman's distinction between *System 1* (automatic) and *System 2* (deliberative) thinking helps explain this effect (Kahneman, 2011) and Sundar and Marathe's *MAIN model* of digital affordances shows how familiarity with interface cues lowers cognitive load and accelerates adoption (Sundar & Marathe, 2010). The result is a seamless cross-platform fluency that benefits usability but entrenches automaticity, reducing moments of mindful disengagement.

This standardisation simultaneously produces lock-in through ubiquity - because platforms now share the same feature repertoires, opting out of one environment does not free the user from its persuasive design logics, resulting in "pervasive embeddedness" of digital infrastructures where habits and social ties, once distributed across multiple platforms, become practically inescapable (Shklovski et al., 2014)

For instance, reels on Instagram, shorts on YouTube, and TikTok's For You feed all rely on the same vertically swiped video format, meaning that leaving one app only delivers the user into an almost identical environment. Hargittai and Litt's work on *digital choice architectures* demonstrates how this narrows options into similar interaction pathways as learned routines—swiping through feeds, tapping story rings, clicking auto-play videos—transfer effortlessly across apps. In this sense, convergence generates redundancy masquerading as choice (Hargittai & Litt, 2013).

A further implication is behavioural conditioning, whereby standardised features reinforce each other across contexts. The intermittent rewards of infinite scroll, the anticipatory cues of story

rings, and the variable notifications designed to trigger return visits no longer operate in silos but echo throughout the ecosystem, amplifying habit strength. Research in HCI has shown how cross-platform reinforcement accelerates "habit loops," embedding behaviours more deeply through repetition across contexts (Stawarz et al., 2015).

Tristan Harris (2017) warns that this dynamic creates a "race to the bottom of the brainstem," where companies escalate the intensity of persuasive features not out of innovation but out of defensive competition. Each platform must keep pace with the engagement arms race, normalising addictive defaults such as autoplay, endless feeds, and push-triggered re-engagement as baseline industry practice.

Finally, convergence generates ethical blind spots. When every major platform adopts similar persuasive features, accountability for their effects becomes diffused. Bucher (2018) describes this as the "opacity of algorithms," where design choices are naturalised and shielded from critical interrogation by being framed as industry norms.

What might otherwise be interrogated as exploitative becomes rebranded as inevitable. As features converge, responsibility for harms is displaced across the ecosystem, leaving no single actor accountable and rendering the escalation of attention-maximising architectures less visible to public scrutiny.

5.2 Short-form Engagement

Short-form video has emerged as the most efficient medium for extracting attention. Unlike text or static images, video is multimodal—combining sound, movement, and visual narrative—while demanding little cognitive effort from the user. When one clip ends, another begins automatically, with the upward swipe as the only minimal input required. In this sense, video is

not simply another content format but the ultimate low-resistance medium, perfectly attuned to the logics of the attention economy: maximising immersion while minimising agency.

The synergy between video and algorithmic recommendation further explains its dominance. Video produces highly granular behavioural signals—completion rates, drop-offs, rewinds, skips—allowing recommender systems to refine predictions in real-time. Reels, Shorts, and TikTok's For You feed do not merely surface popular content; they continuously recalibrate based on each second of user attention. As Gillespie (2014) argues, platforms act as "custodians of visibility" and in a video-first ecosystem this extends to custodianship of temporality, determining not just what users see but how long they remain immersed. Psychologically, short-form video is engineered to exploit attentional vulnerabilities keeping users in a "flow state" (Csikszentmihalyi, 1990). Further underscoring this is Nir Eyal's *Hooked* (2014) model: variable rewards are the engine of habit formation, ensuring that each swipe carries the tantalising possibility of novelty with every swipe.

These logics also reshape cultural production: By privileging 15–60 second bursts, platforms encourage immediacy over reflection and spectacle over nuance. Narrative forms are fragmented into modular clips—stitched, remixed, and set to trending sounds—optimised less for storytelling than for circulation. Trends exemplify this: when one user choreographs a dance, lip-syncs a soundbite, or riffs on a comedic format, millions follow suit. TikTok's "Renegade" dance (2019), the "Don't Rush Challenge" (2020), or the "Wednesday Addams dance" (2022) show how participation is structured less by originality than by strategic conformity. Global challenges like the "Jerusalema" dance (2020) further highlight how short-form video carries cultural flows across borders, but in homogenised repertoires that favour algorithmic spreadability over diversity (Jenkins et al., 2013).

Economically, videos have emerged as the premium inventory by enabling a wide spectrum of monetisation formats—pre-rolls, mid-rolls, overlays, and live shopping integrations deepening platform's dependency on the format.

5.3 Re-engagement Triggers

The dataset's inventory is best understood not as a scatter of interface decisions but as the infrastructure of a larger behavioural strategy: to transform discretionary use into compulsive routine through carefully timed interruptions. Behavioural science shows that external prompts become powerful once they reliably pair with low-effort responses and potential rewards. Wood and Neal (2007) argue that such cue–response pairings, embedded in stable contexts like smartphone use, gradually reduce deliberation and anchor behaviour to the prompt itself rather than to any higher-order goal). Studies consistently demonstrate that notifications, even when ignored, degrade concentration and elevate stress, illustrating how their force lies as much in anticipation as in content. (Stothart et al., 2015) (Kushlev et al., 2016).

As noted earlier, platforms have little to no choice to replicate and one-up each other since inattention yielded to one platform is market share lost to another—If TikTok demonstrates the efficacy of real-time alerts or ephemeral prompts, Instagram and X cannot afford silence.

Reed Hastings's (2017) remark that "sleep is our biggest competitor" reflects the ruthlessness of this logic: nudges exist to reclaim minutes not just from rival platforms but from offline life itself. The cumulative effect is to normalise interruption as a baseline of digital existence, with each platform compelled to match the others in a spiralling contest for attention.

Yet the strategic importance of nudges lies not only in competition but in their colonisation of time. Brigid Schulte's concept of "time confetti" (Schulte, 2014) describes how modern life is fragmented into brief intervals by competing demands; nudges exploit this fragmentation by

targeting idle micro-moments—waiting in a queue, commuting, pausing between tasks, that were once unavailable for monetisation. Inserting reminders into these gaps ensures that no fragment of temporal slack remains unclaimed—even if such interruptions generate a persistent attentional residue, reducing the quality of subsequent offline tasks and deepening dependence on the device for relief(Adams et al., 2015).

Their efficacy also derives from their embedding in social reciprocity. Many of the most potent nudges are not designed as neutral notifications but as signals of visibility: read receipts, typing indicators, story reactions, and follower suggestions all transform platform logic into interpersonal obligation termed as "ambient awareness," where cues sustain a low-level visibility of others and, by extension, pressure to remain visible oneself (Levordashka & Utz, 2016).

To read and not to respond to a message, or re-share a story you are tagged in is to risk signalling indifference or neglect. Platforms thus use these behavioural nudges to weaponise norms of reciprocity, ensuring that users return not only for personal gratification but to maintain ties and avoid reputational costs. In this framing, nudges are less a feature of choice architecture and more instruments of social compulsion, exploiting the affective weight of obligation to secure repeated engagement.

Over time, such exposure lowers resistance thresholds, making each subsequent nudge harder to resist. The effect is self-reinforcing: the more often one responds to prompts, the more they are delivered, and the weaker the individual's capacity to regulate against them. What emerges is a feedback loop where autonomy in attention management is gradually undermined by the very architecture designed to support continuous return.

5.4 Network Effects

The expansion of social graphs demonstrates how platforms continually seek to generate new relational value. The dataset identifies 35 features across Instagram, TikTok, and X directed toward enlarging networks, which confirms that growth is structurally embedded into user interaction rather than left to chance. The theory of network externalities explains the underlying economic rationale: as the number of users increases, so too does the value of the platform, creating a continual incentive to design for connection-building (Katz & Shapiro, 1985).

This is operationalised through recommendation systems such as Instagram's "Suggested for You," TikTok's profile viewers, and X's "Discover People," which systematically expose users to adjacent nodes in the network. Granovetter's theory of weak ties clarifies why these affordances matter: weak connections are disproportionately effective for information diffusion and therefore maximise retention by broadening exposure to content flows (Granovetter, 1973).

The cultivation of ties also functions as a mechanism of social capital. Bourdieu describes social capital as the resources embedded within durable networks (Bourdieu, 1986) and in digital contexts this is expressed through metrics such as follower counts, reposts, and collaborative formats.

Van Dijck's (2013) account of the "culture of connectivity" positions these practices as forms of platformised participation, where the act of tagging, remixing, or sharing not only circulates content but strengthens the connective tissue of the network itself. In this framing, social graph expansion is both a cultural and technical process: participation is routed through features that systematically reinforce growth.

A seminal illustration of this embedded growth strategy can be seen in Facebook's early user retention tactics under Chamath Palihapitiya (2012) who served as Vice President of User

Growth from 2007 to 2011. Palihapitiya's team discovered through data analysis that new users who connected with at least seven friends within their first 10 days on the platform were far more likely to become long-term, active members, creating a critical "aha moment" that dramatically improved retention rates. This insight led to targeted design interventions, such as aggressive friend suggestions, import tools for email contacts, and prompts to add connections during onboarding, which aligned with network externalities by accelerating tie formation to lock users into the ecosystem. By prioritizing rapid graph expansion, Facebook not only scaled to over a billion users but also set a blueprint for modern platforms, where relational thresholds are engineered to convert casual sign-ups into habitual engagement, underscoring the economic imperative of designing for exponential network value.

In recent years, Instagram's "Add Yours" templates or TikTok's "say hi" prompt exemplify the same strategies in a new avatar, creating new opportunities for renewed contact. From a structural perspective, these mechanisms reinforce lock-in effects. Shapiro and Varian demonstrate that once a network achieves critical mass, exit costs rise sharply because relationships and accumulated social capital cannot be easily transferred elsewhere (Shapiro & Varian, 1999).

Features that integrate external ecosystems, such as Instagram's QR code follows or WhatsApp contact imports, intensify this dependency by extending the graph beyond the platform's own boundaries.

Finally, the expansion of social graphs illustrates what Couldry and Mejias (2019) term the "connective appropriation" of human interaction. Each incremental connection increases the density of relational data, which feeds back into recommendation systems, refines algorithmic predictions, and enhances advertising precision. The growth of the graph is thus not a by-product of user activity but a core infrastructural goal: features are designed to ensure that

every return to the platform multiplies connections, expands diffusion pathways, and strengthens retention through relational dependence. In the logic of the attention economy, the social graph operates as both the means of engagement and the guarantor of its continuity.

5.5 The Emerging Role of AI: A Landscape Transformed

This thesis has focused on established design patterns in social media, deliberately sidelining the burgeoning role of artificial intelligence, recognizing AI as a vast, transformative domain warranting its own dedicated inquiry. Yet, no forward-looking discussion would be complete without acknowledging how AI is poised to revolutionize the landscape, amplifying behavioral engineering in ways that make current designs seem rudimentary..

Central to this shift is the phenomenon of "AI sludge" or "AI slop" (Vincent, 2023) —low-quality, inauthentic content generated en masse by AI tools to game algorithms and flood feeds. Unlike human-created spam, AI sludge scales effortlessly, producing endless variations of videos, images, and posts optimized for engagement metrics like views and shares. This means feeds increasingly filled with hyper-stimulating, algorithmically refined content that exploits dopamine loops more efficiently than ever, making it "so much easier to create stimulating content" that hooks users without substance.

AI's generative capabilities—evident in trends like AI-powered personalization and content adaptation—will lower barriers for creators, enabling rapid production of short-form videos tailored to individual preferences. However, this ease risks an "enshittification" of platforms (Doctorow, 2022), where sludge overwhelms authentic interactions, eroding trust and amplifying harms like misinformation. As AI evolves, features like dynamic UIs or predictive nudges could personalize dark patterns, e.g., generating FOMO-inducing notifications in real-time. The thesis omitted AI to maintain focus, but its integration signals a paradigm shift: from human-designed

persuasion to machine-orchestrated compulsion, necessitating urgent ethical reevaluation as platforms pivot to AI-driven models.

6. Conclusion

At the heart of this thesis lay a critical inquiry: **Do social media platforms engineer user behaviour through design?** This question probed beyond the surface-level functionalities of platforms like Instagram, TikTok, and X (formerly Twitter), delving into the intentional architectural choices that transform passive scrolling into habitual engagement, casual interactions into data-rich feedback loops, and digital spaces into environments of behavioural modification. By examining sub-questions—such as how interface features shape user actions, the psychological mechanisms underpinning these designs—the thesis has sought to uncover the subtle yet powerful ways in which design serves as the engine of platform capitalism.

The analysis revealed patterns of persuasion embedded in ordinary interactions: Features that appear innocuous, systematically reshape behaviour. Organised into four thematic clusters—cross-platform convergence, short-form video dominance, re-engagement nudges, and social graph expansion—the findings provided substantial evidence that social media platforms do engineer user behaviour through design.

A potential critique of the analysis might arise from its expansive classification of social media features—from likes and shares to typing indicators, and quote buttons—as deliberate "engagement features" engineered to shape user behavior. Yet, this perspective is not an overreach but a reflection of the platforms' intentional design ethos, where no element is incidental, and each serves as a subtle nudge within the attention economy.

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Consider the "like" button: its implementation could suffice as a simple counter, but platforms like X and Instagram amplify it with animated hearts or confetti bursts, invoking immediate dopamine-driven reinforcement to encourage habitual scrolling and reciprocit.

Similarly, tagging (or mentions) transcends mere commentary by transforming passive content into targeted social summons, pulling users back into conversations and fostering a sense of obligation that could otherwise be achieved through unstructured replies.

Typing indicators and read receipts, ostensibly for "convenience," expose interpersonal dynamics in real-time, normalizing surveillance-like transparency that pressures users to respond promptly, thereby extending session durations.

Social media platforms have progressively normalized these pervasive mechanisms, eroding user autonomy under the veneer of enhanced connectivity. Looking ahead, the trajectory suggests an intensification of these practices. By 2025, platforms already demonstrate a deepening reliance on immersive, frictionless experiences, with short-form video cemented as the dominant format (Montag et al., 2021). Convergence will likely accelerate, with platforms adopting hybrid features that blend e-commerce, live interaction, and augmented reality to produce "seamless ecosystems" in which consumption and transaction occur fluidly. At the same time, design innovations will likely include more sophisticated predictive nudges, powered by machine learning and real-time data. These may take the form of adaptive user interfaces that morph in response to fatigue or mood, while large-scale A/B testing continually optimises micro-moments of attention (Eslami et al., 2019).

While platforms may experiment with so-called "ethical toggles" in response to regulatory scrutiny, these may prove superficial, as the business model remains tethered to engagement. The rising demand for "authentic" and unfiltered content, meanwhile, may lead to temporary stylistic shifts, but algorithmic curation will ensure that even these counter-movements remain

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folded back into the logics of engagement. The likely outcome is a more integrated digital life, where social media blurs with other services—from commerce to metaverse extensions—at the cost of heightened behavioural surveillance unless checked by intervention.

The questions raised by this thesis touch on issues that extend far beyond the remit of any single piece of academic research. The engineering of attention is not only a matter of design but also of economics, psychology, law, and culture. It involves multiple stakeholders—platform companies, policymakers, civil society, and users themselves—each with competing interests and perspectives. Against such complexity, it would be premature to suggest a definitive solution to the problems identified.

What can be observed, however, is that governments and regulators have begun to experiment with interventions. In the European Union, the Digital Services Act (2022) requires very large platforms to conduct systemic risk assessments and increase transparency around recommender systems (European Commission, 2024; EPRS, 2023). In the UK, the Online Safety Act (2023) has empowered Ofcom to regulate harmful design features, particularly those affecting children (Thomas, 2025; Ofcom, 2025). More recently, the EU's AI Act (2024) has introduced obligations for high-risk systems, including algorithmic recommenders and generative AI applications (European Parliament, 2024; European Commission, 2025).

These measures illustrate a growing recognition that social media platforms and the way it is designed is not a neutral technical question but a matter of public interest. Whether such initiatives will be sufficient—or whether entirely new approaches will be required—remains uncertain.

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8. Appendix

Appendix A - Descriptive Feature Catalogue

Product	Feature ID	Feature Name	Feature Description
Instagram	IG-001	Auto-play	Videos begin playing automatically without user initiation as they appear on screen.
Instagram	IG-002	Infinite Scroll	The feed continuously loads new content as the user scrolls down, without a defined end.
Instagram	IG-003	Likes	Users can tap a heart icon to express appreciation for a post.
Instagram	IG-004	Comments	Users can write and post text responses under a post.
Instagram	IG-005	GIF Comments	Users can add animated GIFs to their comments.
Instagram	IG-006	Tagging (Mentions)	Users can tag others in posts or stories using @username.
Instagram	IG-007	Push Notifications	Alerts sent to the device for likes, comments, follows, and other activities.
Instagram	IG-008	"....." (Typing)	Indicator showing when someone is typing in direct messages.
Instagram	IG-009	"Seen"	Marker indicating when a message or story has been viewed.
Instagram	IG-010	Red Circle Around Stories	A red ring highlights new or unseen stories at the top of the feed.
Instagram	IG-011	Green Circle Around Stories	A green ring indicates close friends' stories.
Instagram	IG-012	Counters on Messages & Notifications	Numeric badges showing unread message or notification counts.
Instagram	IG-013	Suggested Posts	Algorithmically recommended content inserted into the feed.
Instagram	IG-014	Suggested for You (New People to Follow)	Recommendations of accounts to follow based on interests.
Instagram	IG-015	Different Navigation Bar	Customizable or context-specific bottom navigation menu.
Instagram	IG-016	Separate Reels Tab	Dedicated tab for short-form video content.
Instagram	IG-017	Friends Sub-tab	Section showing content from followed accounts only.
Instagram	IG-018	Repost	Ability to share others' posts to one's own feed or stories.
Instagram	IG-019	Sent as a Direct Message (#)	Counter showing how many times a post was shared via DM.
Instagram	IG-020	QR Code	Scannable code for quick profile or account following.
Instagram	IG-021	Post to WhatsApp Stories directly	Option to cross-post Instagram stories to WhatsApp.
Instagram	IG-022	Notes	Short text updates visible to followers for a limited time.
Instagram	IG-023	Camera Icon to directly send photos	Quick access to camera for capturing and sending images in DMs.
Instagram	IG-024	Ask Meta	AI-powered assistant for queries within the app.
Instagram	IG-025	Double-tap to like	Gesture to like a post by tapping twice on it.
Instagram	IG-026	Double-tap to switch accounts	Gesture to toggle between multiple logged-in accounts.
Instagram	IG-027	Story Highlights	Curated collections of saved stories on profiles.
Instagram	IG-028	Discover People	Section suggesting new users to follow based on contacts or interests.
Instagram	IG-029	Swipe back takes to Reels	Swiping gesture redirects to Reels section.
Instagram	IG-030	Pull to Refresh	Downward swipe to reload the feed with new content.
Instagram	IG-031	Asymmetric Follow Friction	Easier to follow than unfollow, with confirmations for unfollowing.
Instagram	IG-032	Home button (Refresh)	Button to return to the top of the feed and load new posts.
Instagram	IG-033	Delete Account flow	Process to permanently remove an account.
Instagram	IG-034	Memories	Reminders of past posts on their anniversaries.
Instagram	IG-035	Bookmarks	Saving posts for later viewing in a private collection.
Instagram	IG-036	Emoji reactions in DMs	Quick emoji responses to messages.

Product	Feature ID	Feature Name	Feature Description
Instagram	IG-037	Hashtag auto-complete	Suggestions while typing hashtags.
Instagram	IG-038	Event Reminders	Notifications for upcoming events or live sessions.
Instagram	IG-039	Collections (Collaborate with friends)	Shared saved post collections with others.
Instagram	IG-040	Follow Contact on Instagram (WhatsApp)	Option to follow WhatsApp contacts on Instagram.
Instagram	IG-041	Poll Stickers	Interactive polls added to stories.
Instagram	IG-042	Polls in Reels	Poll functionality within short videos.
Instagram	IG-043	Stickers - questions, emoji slider, quiz, countdown	Various interactive stickers for stories.
Instagram	IG-044	Face filters	Augmented reality effects for photos and videos.
Instagram	IG-045	Add Yours (Template)	Chain-style story prompts for users to contribute.
Instagram	IG-046	Remix for Reels	Collaborating on Reels by adding to existing videos.
Instagram	IG-047	Collaboration posts	Joint posts credited to multiple accounts.
Instagram	IG-048	Translate	Automatic translation of text in posts or comments.
Instagram	IG-049	Share Options	Various ways to share content externally or internally.
Instagram	IG-050	Trending Audio	Popular sound clips suggested for use in Reels.
Instagram	IG-051	Live stream	Real-time video broadcasting to followers.
Instagram	IG-052	Add comments to other stories	Ability to comment on public stories.
Instagram	IG-053	Reactions to Stories	Quick emoji responses to stories.
Instagram	IG-054	You may know	Suggestions of potential acquaintances based on mutual connections.
Instagram	IG-055	Reply Assist	AI-powered suggestions for story replies.
TikTok	TT-001	Auto-play	Videos play automatically upon loading.
TikTok	TT-002	Infinite Scroll	Endless vertical scrolling through video feed.
TikTok	TT-003	Likes	Heart button to show approval of a video.
TikTok	TT-004	Comments	Text responses under videos.
TikTok	TT-005	GIF Comments	Animated GIFs in comment sections.
TikTok	TT-006	Tagging (Mentions)	@username tags in videos or comments.
TikTok	TT-007	Push Notifications	Device alerts for interactions or new content.
TikTok	TT-008	Red Circle Around Stories	Highlight for new short-form updates.
TikTok	TT-009	Counters on Messages & Notifications	Badges indicating unread items.
TikTok	TT-010	Suggested for You (New People to Follow)	Algorithmic account recommendations.
TikTok	TT-011	Friends Sub-tab	Feed focused on followed creators.
TikTok	TT-012	Repost	Sharing others' videos to one's profile.
TikTok	TT-013	Sent as a Direct Message (#)	Count of private shares.
TikTok	TT-014	Pull to Refresh	Swipe down to update the feed.
TikTok	TT-015	QR Code	Scannable code for following or linking.
TikTok	TT-016	Home button (Refresh)	Icon to reset and reload the main feed.
TikTok	TT-017	Cross-collaboration with WhatsApp	Integration for sharing or following via WhatsApp.
TikTok	TT-018	Asymmetric Follow Friction	Simplified following with barriers to unfollowing.
TikTok	TT-019	Double-tap to like	Tap gesture for liking videos.
TikTok	TT-020	..... (typing)	Typing indicator in chats.

Product	Feature ID	Feature Name	Feature Description
TikTok	TT-021	Seen	View confirmation for messages.
TikTok	TT-022	For You' default	Main feed starts with personalized recommendations.
TikTok	TT-023	Full Screen	Videos occupy the entire device screen.
TikTok	TT-024	Related Search (Under Posts)	Suggested searches based on viewed content.
TikTok	TT-025	STEM tab	Dedicated section for science, tech, engineering, math content.
TikTok	TT-026	Integrated 1-Click Ads	Seamless ad purchases within the app.
TikTok	TT-027	Slot Machine - Shop	Gamified shopping experience with random elements.
TikTok	TT-028	Message prompt Sticker (It's been a while, say hi)	Stickers to restart inactive chats.
TikTok	TT-029	Join live' prompt under search	Suggestions to enter ongoing live streams from search.
TikTok	TT-030	'You may like' under search	Personalized video suggestions in search results.
TikTok	TT-031	Story prompt	Ideas or templates for creating stories.
TikTok	TT-032	Who has viewed your profile?	List of profile visitors.
TikTok	TT-033	Total Likes (Display)	Visible count of all likes received.
TikTok	TT-034	Bookmarks	Saving videos for later.
TikTok	TT-035	Emoji reactions in DMs	Emoji responses to messages.
TikTok	TT-036	Analytics	Performance data for creators' videos.
TikTok	TT-037	Hashtag auto-complete	Suggestions while entering hashtags.
TikTok	TT-038	Event Reminders	Alerts for scheduled events or lives.
TikTok	TT-039	Share Options	Multiple ways to distribute videos externally.
TikTok	TT-040	Duet Feature	Side-by-side video creation with existing content.
TikTok	TT-041	Stitch Feature	Clipping and appending to other videos.
TikTok	TT-042	Trending Audio	Popular sounds for video creation.
TikTok	TT-043	Live stream	Real-time broadcasting.
TikTok	TT-044	Q&A Feature	Asking and answering questions in videos or lives.
TikTok	TT-045	Auto-caption	Automatic text generation for video audio.
TikTok	TT-046	Playlist to other videos	Grouping videos into themed lists.
TikTok	TT-047	Polls in Live	Interactive polls during streams.
TikTok	TT-048	Send gifts on Live	Virtual gifts purchased and sent to streamers.
TikTok	TT-049	Face Filters	AR effects for faces in videos.
TikTok	TT-050	Select Templates	Pre-made video layouts for easy creation.
TikTok	TT-051	Add Yours	Prompts for users to add their take on a trend.
TikTok	TT-052	Stickers - Poll, Emoji sliders	Interactive elements in videos.
TikTok	TT-053	Reactions to Stories	Emoji feedback on short updates.
TikTok	TT-054	You may know	Suggestions of familiar people.
TikTok	TT-055	Translate	Text translation in videos or comments.
TikTok	TT-056	Delete Account flow	Steps to deactivate or delete profile.
X (Twitter)	X-001	Auto-play	Videos play automatically in the timeline.
X (Twitter)	X-002	Infinite Scroll	Continuous loading of tweets as scrolling continues.
X (Twitter)	X-003	Likes	Heart icon to favorite a tweet.
X (Twitter)	X-004	Comments	Replies to tweets forming conversation threads.
X (Twitter)	X-005	GIF Comments	Animated images in replies.
X (Twitter)	X-006	Tagging (Mentions)	@username to notify users in tweets.

Product	Feature ID	Feature Name	Feature Description
X (Twitter)	X-007	**Push Notifications**	Alerts for mentions, likes, or follows.
X (Twitter)	X-008	**..... (typing)**	Indicator of active typing in direct messages.
X (Twitter)	X-009	**Seen**	Read receipts in DMs.
X (Twitter)	X-010	**Repost**	Sharing a tweet to one's followers (formerly retweet).
X (Twitter)	X-011	**Threads**	Series of connected tweets.
X (Twitter)	X-012	**Home button (Refresh)**	Icon to reload the timeline.
X (Twitter)	X-013	**Pull to Refresh**	Swipe to update content.
X (Twitter)	X-014	**X' more tweets at the top**	Notification of new tweets above the current view.
X (Twitter)	X-015	**Default 'For You'**	Algorithmic timeline as the primary view.
X (Twitter)	X-016	**Communities**	Group spaces for topic-specific discussions.
X (Twitter)	X-017	**Views on a post**	Count of tweet impressions.
X (Twitter)	X-018	**Quote**	Reposting with added commentary.
X (Twitter)	X-019	**Hashtags**	#keywords for categorizing tweets.
X (Twitter)	X-020	**Trending**	List of popular topics and hashtags.
X (Twitter)	X-021	**Explore tab**	Section for searching trends, news, and more.
X (Twitter)	X-022	**Twitter Spaces**	Live audio conversation rooms.
X (Twitter)	X-023	**Bookmarks**	Private saving of tweets.
X (Twitter)	X-024	**Blue Checkmark**	Verification badge for authenticated accounts.
X (Twitter)	X-025	**Separate Videos Tab**	Dedicated area for video content.
X (Twitter)	X-026	**Undo Tweet**	Brief window to retract a posted tweet.
X (Twitter)	X-027	**Ask Grok icon on tweets**	Button to query AI about tweet content.
X (Twitter)	X-028	**Ask Grok**	Integrated AI chatbot for questions.
X (Twitter)	X-029	**Hashflags**	Custom emojis tied to specific hashtags.
X (Twitter)	X-030	**Birthday Balloons**	Animation on profiles during birthdays.
X (Twitter)	X-031	**Pinned Tweets/Highlights**	Fixed tweet at the top of a profile.
X (Twitter)	X-032	**Emoji reactions in DMs**	Emoji responses to messages.
X (Twitter)	X-033	**Community Notes**	User-contributed fact-checks on tweets.
X (Twitter)	X-034	**Analytics**	Data on tweet performance.
X (Twitter)	X-035	**Hashtag auto-complete**	Suggestions when typing hashtags.
X (Twitter)	X-036	**Discover people**	Recommendations for new follows.
X (Twitter)	X-037	**Translate**	Option to translate tweets in foreign languages.
X (Twitter)	X-038	**Share Options**	Ways to export tweets to other platforms.
X (Twitter)	X-039	**Pinned Tweets from Accounts you follow**	Highlighted pinned posts in the feed.
X (Twitter)	X-040	**Delete Account flow**	Process for account deactivation.
X (Twitter)	X-041	**View Quotes'**	1-click for viewing quotes posts.

Appendix B - Coded Feature Catalogue

Product	Feature ID	Feature Name	Category	BCT (Primary)	BCT (Secondary)	BCT Justification	FBM – Behaviour (B)	FBM - Motivation (M)	FBM - Ability (A)	FBM - Prompt (P)
Instagram	IG-003	Likes	Social Proof & In	6.2 Social comparison	6.3 Information about others' approval	Fostering engagement using social cues	Like a post	Social Motivation (Belonging), Pleasure/Pain (Sensation)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
Instagram	IG-004	Comments	Social Proof & In	6.2 Social comparison	6.3 Information about others' approval	Fostering engagement using social cues	Comment on a post	Social Motivation (Belonging), Pleasure/Pain (Sensation)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
Instagram	IG-006	Tagging (Mentions)	Social Proof & In	3.1 Social support (unspecified)	7.1 Prompts/cues	Tagging brings specific users into an activity, prompting acknowledgement	Tag friends/accounts in posts/comments	Pleasure/Pain (Sensation), Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
Instagram	IG-011	Green Circle Around Stories	Social Proof & In	6.3 Information about others' approval	7.1 Prompts/cues	Encourages behaviour by highlighting acceptance and approval from trusted peers.	View exclusive close-friend Story	Pleasure/Pain (Sensation), Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
Instagram	IG-014	Suggested for You (New People to Follow)	Social Proof & In	7.1 Prompts/cues	7.2 Cue Signalling Reward	'Suggested for You' provides timely cues that prompt engagement and, because they are personalized to user interests, reliably signal that interacting with them will be rewarding.	Follow suggested account	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
Instagram	IG-017	Friends Sub-tab	Social Proof & In	6.2 Social comparison	N/A	Enables and encourages comparison of user's actions with those of peers/friends.	View friend activity feed	Social Motivation (Belonging), Pleasure/Pain (Sensation), Hope/Fear (Anticipation)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
Instagram	IG-018	Repost	Social Proof & In	7.1 Prompts/cues	N/A	Introduces a clear environmental or social stimulus at the right moment to trigger the reposting behavior.	Repost Reel to followers	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
Instagram	IG-019	Sent as a Direct Message (#)	Social Proof & In	6.2 Social comparison	6.3 Information about others' approval	invites social comparison and communicates widespread approval, encouraging you to do the same by leveraging social norms and collective endorsement.	Share content via DM	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
Instagram	IG-020	QR Code	Social Proof & In	12.5 Adding objects to the environment	N/A	Adds a digital object to the environment, making it easier for users to share	Share code / scan code to add contact	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	"Facilitator (Low ability, High motovation"
Instagram	IG-021	Post to WhatsApp Stories directly	Social Proof & In	12.5 Adding objects to the environment	N/A	Enable and facilitate cross-posting by removing friction to share content to different audience groups.	Share post to WhatsApp stories directly	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	"Facilitator (Low ability, High motovation"
Instagram	IG-028	Discover People	Social Proof & In	7.1 Prompts/cues	N/A	Algorithmic prompts to expand user's social graph with minimal effort.	Follow, expand network	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
Instagram	IG-054	You may know	Social Proof & In	7.1 Prompts/cues		Encourage to connect with new users to increase social graph.	Follow new people	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
TikTok	TT-003	Likes	Social Proof & In	6.2 Social compa	6.3 Information ab	Fostering engagement	Like a post	Social Motivation (Belonging), Pleasure/Pain (Sensation)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nu
TikTok	TT-004	Comments	Social Proof & In	6.2 Social compa	6.3 Information ab	Fostering engagement	Comment on a post	Social Motivation (Belonging), Pleasure/Pain (Sensation)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nu
TikTok	TT-006	Tagging (Mentions)	Social Proof & In	3.1 Social support (unspecified)	7.1 Prompts/cues	agging brings specific users into an activity, prompting acknowledgement	Tag friend/account in post/comment	Pleasure/Pain (Sensation), Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
TikTok	TT-010	Suggested for You (New People to Follow)	Social Proof & In	7.1 Prompts/cues	7.2 Cue Signalling Reward	Suggested for You' provides timely cues that prompt engagement and, because they are personalized to user interests, reliably signal that interacting with them will be rewarding.	Follow suggested account	Pleasure/Pain (Sensation)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
TikTok	TT-011	Friends Sub-tab	Social Proof & In	6.2 Social comparison	N/A	Enables and encourages comparison of user's actions with those of peers/friends.	View friend activity feed	Social Motivation (Belonging), Hope/Fear (Anticipation)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)

Product	Feature ID	Feature Name	Category	BCT (Primary)	BCT (Secondary)	BCT Justification	FBM – Behaviour (B)	FBM - Motivation (M)	FBM - Ability (A)	FBM - Prompt (P)
TikTok	TT-012	Repost	Social Proof & In	7.1 Prompts/cues	N/A	Introduces a clear environmental or social stimulus at the right moment to trigger the reposting behavior.	Repost Reel to followers	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
TikTok	TT-013	Sent as a Direct Message (#)	Social Proof & In	6.2 Social comparison	6.3 Information about others' approval	invites social comparison and communicates widespread approval, encouraging you to do the same by leveraging social norms and collective endorsement.	Share content via DM	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
TikTok	TT-015	QR Code	Social Proof & In	12.5 Adding objects to the environment	N/A	Adds a digital object to the environment, making it easier for users to share	Share code / scan code to add contact	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	"Facilitator (Low ability, High motovation"
TikTok	TT-018	Asymmetric Follow Friction	Social Proof & In	12.5 Adding objects to the environment	7.1 Prompts/cues	Introduces prominent follow buttons to increase user's social graph.	Tap to follow, multi-step unfollow	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
TikTok	TT-030	'You may like' under search	Social Proof & In	7.1 Prompts/cues	3.1 Social support (unspecified)	Encourages inreasing user's social graph through timely nudges.	Explore new accounts	Social Motivation (Belonging), Pleasure/Pain (Sensation)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
TikTok	TT-032	Who has viewed your profile?	Social Proof & In	6.2 Social comparison	6.3 Information about others' approval	Prolong engagement by introducing real-time social interaction elements.	Click on who has viewed your profile and increase social graph.	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
TikTok	TT-033	Total Likes (Display)	Social Proof & In	6.2 Social comparison	6.3 Information about others' approval	Prolong engagement by introducing real-time social interaction elements.	Post new engaging content to increase likes.	Social Motivation (Belonging), Pleasure/Pain (Sensation)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
TikTok	TT-054	You may know	Social Proof & In	7.1 Prompts/cues		Encourage to connect with new users to increase social graph.	Follow new people	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
X (Twitter)	X-003	Likes	Social Proof & In	6.2 Social comparison	6.3 Information about others' approval	Fostering engagement using social cues	Like a post	Social Motivation (Belonging), Pleasure/Pain (Sensation)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
X (Twitter)	X-004	Comments	Social Proof & In	6.2 Social comparison	6.3 Information about others' approval	Fostering engagement using social cues	Comment on a post	Social Motivation (Belonging), Pleasure/Pain (Sensation)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
X (Twitter)	X-006	Tagging (Mentions)	Social Proof & In	3.1 Social support (unspecified)	7.1 Prompts/cues	agging brings specific users into an activity, prompting acknowledgement	Tag friend/account in post/comment	Pleasure/Pain (Sensation), Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
X (Twitter)	X-010	Repost	Social Proof & In	7.1 Prompts/cues	N/A	Introduces a clear environmental or social stimulus at the right moment to trigger the reposting behavior.	Repost Reel to followers	Social Motivation	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
X (Twitter)	X-016	Communities	Social Proof & In	3.1 Social support (unspecified)	7.1 Prompts/cues	Facilitate discussions by bringing like-minded users together	Join new communities	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
X (Twitter)	X-017	Views on a post	Social Proof & In	6.2 Social comparison	6.3 Information about others' approval	Prolong engagement by introducing real-time social interaction elements.	Post new engaging content to increase likes.	Social Motivation (Belonging), Pleasure/Pain (Sensation)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
X (Twitter)	X-018	Quote	Social Proof & In	7.1 Prompts/cues	N/A	Introduces a clear environmental or social stimulus at the right moment to trigger the reposting behavior.	Repost Reel to followers	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
X (Twitter)	X-021	Explore tab	Social Proof & In	7.1 Prompts/cues	3.1 Social support (unspecified)	Encourages inreasing user's social graph through timely nudges.	Explore new accounts	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
X (Twitter)	X-024	Blue Tick	Social Proof & In	9.1 Credible Source		Use social signal cues to create a sense of importance	Apply for a blue tick	Social Motivation	Time, Physical Effort, Brain Cycles, Social Deviance	Signal (Timely nudge)
X (Twitter)	X-036	Discover people	Social Proof & In	7.1 Prompts/cues	7.2 Cue Signalling Reward	Suggested for You' provides timely cues that prompt engagement and, because they are personalized to user interests, reliably signal that interacting with them will be rewarding.	Follow suggested account	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)
X (Twitter)	X-041	View Quotes'	Social Proof & Influence	12.5 Adding objects to the environment		Adding a new button to encourage user discovery	Clicks and views quote posts	Social Motivation (Belonging)	Time, Physical Effort, Brain Cycles, Social Deviance, Money, Routine	Signal (Timely nudge)

Appendix C - BCT Taxonomy (v1)

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BCT Taxonomy (v1): 93 hierarchically-clustered techniques

Note for Users

The definitions of Behavior Change Techniques (BCTs):

i)   contain verbs (e.g., provide, advise, arrange, prompt) that refer to the action(s)
        taken by the person/s delivering the technique. BCTs can be delivered by an 'interventionist' or self-delivered

ii)   contain the term **"behavior"** referring to a single action or sequence of actions that includes the
        performance of **wanted** behavior(s) and/or **inhibition** (non-performance) of **unwanted** behavior(s)

iii)   note alternative or additional coding where relevant

iv)   note the technical terms associated with particular theoretical frameworks where relevant (e.g.
        'including implementation intentions)

No.	Label	Definition	Examples
1. Goals and planning			
1.1	***Goal setting (behavior)***	Set or agree on a goal defined in terms of the behavior to be achieved *Note: only code goal-setting if there is sufficient evidence that goal set as part of intervention; if goal unspecified or a behavioral outcome, code **1.3, Goal setting (outcome)**; if the goal defines a specific context, frequency, duration or intensity for the behavior, also code **1.4, Action planning***	Agree on a daily walking goal (e.g. 3 miles) with the person and reach agreement about the goal Set the goal of eating 5 pieces of fruit per day as specified in public health guidelines
1.2	***Problem solving***	Analyse , or prompt the person to analyse, factors influencing the behavior and generate or select strategies that include overcoming barriers and/or increasing facilitators (includes '**Relapse Prevention***' and '**Coping Planning***') *Note: barrier identification without solutions is not sufficient. If the BCT does not include analysing the behavioral problem, consider **12.3, Avoidance/changing exposure to cues for the behavior, 12.1, Restructuring the physical environment, 12.2, Restructuring the social environment,** or **11.2, Reduce negative emotions***	Identify specific triggers (e.g. being in a pub, feeling anxious) that generate the urge/want/need to drink and develop strategies for avoiding environmental triggers or for managing negative emotions, such as anxiety, that motivate drinking Prompt the patient to identify barriers preventing them from starting a new exercise regime e.g., lack of motivation, and discuss ways in which they could help overcome them e.g., going to the gym with a buddy

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1.3	*Goal setting (outcome)*	Set or agree on a goal defined in terms of a positive **outcome** of wanted behavior *Note: only code guidelines if set as a goal in an intervention context; if goal is a behavior, code 1.1, Goal setting (behavior); if goal unspecified code 1.3, Goal setting (outcome)*	Set a weight loss goal (e.g. 0.5 kilogram over one week) as an outcome of changed eating patterns
1.4	*Action planning*	Prompt detailed planning of performance of the behavior (must include at least one of context, frequency, duration and intensity). Context may be environmental (physical or social) or internal (physical, emotional or cognitive) (includes '**Implementation Intentions**') *Note: evidence of action planning does not necessarily imply goal setting, only code latter if sufficient evidence*	Encourage a plan to carry condoms when going out socially at weekends Prompt planning the performance of a particular physical activity (e.g. running) at a particular time (e.g. before work) on certain days of the week
1.5	*Review behavior goal(s)*	Review behavior goal(s) jointly with the person and consider modifying goal(s) or behavior change strategy in light of achievement. This may lead to re-setting the same goal, a small change in that goal or setting a new goal instead of (or in addition to) the first, or no change *Note: if goal specified in terms of behavior, code 1.5, Review behavior goal(s), if goal unspecified, code 1.7, Review outcome goal(s); if discrepancy created consider also 1.6, Discrepancy between current behavior and goal*	Examine how well a person's performance corresponds to agreed goals e.g. whether they consumed less than one unit of alcohol per day, and consider modifying future behavioral goals accordingly e.g. by increasing or decreasing alcohol target or changing type of alcohol consumed
1.6	*Discrepancy between current behavior and goal*	Draw attention to discrepancies between a person's current behavior (in terms of the *form, frequency, duration, or intensity* of that behavior) and the person's previously set outcome goals, behavioral goals or action plans (goes beyond self-monitoring of behavior) *Note: if discomfort is created only code 13.3, Incompatible beliefs and <u>not</u> 1.6, Discrepancy between current behavior and goal; if goals are modified, also code 1.5, Review behavior goal(s) and/or 1.7, Review outcome goal(s); if feedback is provided, <u>also</u> code 2.2, Feedback on behaviour*	Point out that the recorded exercise fell short of the goal set

1.7	*Review outcome goal(s)*	Review outcome goal(s) jointly with the person and consider modifying goal(s) in light of achievement. This may lead to re-setting the same goal, a small change in that goal or setting a new goal instead of, or in addition to the first *Note: if goal specified in terms of behavior, code **1.5, Review behavior goal(s)**, if goal unspecified, code **1.7, Review outcome goal(s);** if discrepancy created consider also **1.6, Discrepancy between current behavior and goal***	Examine how much weight has been lost and consider modifying outcome goal(s) accordingly e.g., by increasing or decreasing subsequent weight loss targets
1.8	*Behavioral contract*	Create a written specification of the behavior to be performed, agreed on by the person, and witnessed by another *Note: <u>also</u> code **1.1, Goal setting (behavior)***	Sign a contract with the person e.g. specifying that they will not drink alcohol for one week
1.9	*Commitment*	Ask the person to affirm or reaffirm statements indicating commitment to change the behavior *Note: if defined in terms of the behavior to be achieved <u>also</u> code **1.1, Goal setting (behavior)***	Ask the person to use an "I will" statement to affirm or reaffirm a strong commitment (i.e. using the words "strongly", "committed" or "high priority") to start, continue or restart the attempt to take medication as prescribed
2. Feedback and monitoring			
2.1	*Monitoring of behavior by others without feedback*	Observe or record behavior with the person's knowledge as part of a behavior change strategy *Note: if monitoring is part of a data collection procedure rather than a strategy aimed at changing behavior, do not code; if feedback given, code only **2.2, Feedback on behavior**, and <u>not</u> **2.1, Monitoring of behavior by others without feedback**; if monitoring outcome(s) code **2.5, Monitoring outcome(s) of behavior by others without feedback**; if self-monitoring behavior, code **2.3, Self-monitoring of behaviour***	Watch hand washing behaviors among health care staff and make notes on context, frequency and technique used

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2.2	*Feedback on behavior*	Monitor and provide informative or evaluative feedback on performance of the behavior *(e.g. form, frequency, duration, intensity)* *Note: if Biofeedback, code only **2.6, Biofeedback** and <u>not</u> **2.2, Feedback on behavior**; if feedback is on **outcome(s)** of behavior, code **2.7, Feedback on outcome(s) of behavior**; if there is no clear evidence that feedback was given, code **2.1, Monitoring of behavior by others without feedback**; if feedback on behaviour is evaluative e.g. praise, also code **10.4, Social reward***	Inform the person of how many steps they walked each day (as recorded on a pedometer) or how many calories they ate each day (based on a food consumption questionnaire).
2.3	*Self-monitoring of behavior*	Establish a method for the person to monitor and record their behavior(s) as part of a behavior change strategy *Note: if monitoring is part of a data collection procedure rather than a strategy aimed at changing behavior, do not code; if monitoring of outcome of behavior, code **2.4, Self-monitoring of outcome(s) of behavior**; if monitoring is by someone else (without feedback), code **2.1, Monitoring of behavior by others without feedback***	Ask the person to record daily, in a diary, whether they have brushed their teeth for at least two minutes before going to bed Give patient a pedometer and a form for recording daily total number of steps
2.4	*Self-monitoring of outcome(s) of behavior*	Establish a method for the person to monitor and record the **outcome(s)** of their behavior as part of a behavior change strategy *Note: if monitoring is part of a data collection procedure rather than a strategy aimed at changing behavior, do not code ; if monitoring behavior, code **2.3, Self-monitoring of behavior**; if monitoring is by someone else (without feedback), code **2.5, Monitoring outcome(s) of behavior by others without feedback***	Ask the person to weigh themselves at the end of each day, over a two week period, and record their daily weight on a graph to increase exercise behaviors

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2.5	**Monitoring outcome(s) of behavior by others without feedback**	Observe or record outcomes of behavior with the person's knowledge as part of a behavior change strategy *Note: if monitoring is part of a data collection procedure rather than a strategy aimed at changing behavior, do not code; if feedback given, code only **2.7, Feedback on outcome(s) of behavior**; if monitoring behavior code **2.1, Monitoring of behavior by others without feedback**; if self-monitoring outcome(s), code **2.4, Self-monitoring of outcome(s) of behavior***	Record blood pressure, blood glucose, weight loss, or physical fitness
2.6	**Biofeedback**	Provide feedback about the body *(e.g. physiological or biochemical state)* using an external monitoring device as part of a behavior change strategy *Note: if Biofeedback, code only **2.6, Biofeedback** and <u>not</u> **2.2, Feedback on behavior** or **2.7, Feedback on outcome(s) of behaviour***	Inform the person of their blood pressure reading to improve adoption of health behaviors
2.7	**Feedback on outcome(s) of behavior**	Monitor and provide feedback on the outcome of performance of the behavior *Note: if Biofeedback, code only **2.6, Biofeedback** and <u>not</u> **2.7, Feedback on outcome(s) of behavior**; if feedback is on behavior code **2.2, Feedback on behavior**; if there is no clear evidence that feedback was given code **2.5, Monitoring outcome(s) of behavior by others without feedback**; if feedback on behaviour is evaluative e.g. praise, also code **10.4, Social reward***	Inform the person of how much weight they have lost following the implementation of a new exercise regime

3. Social support			
3.1	**Social support (unspecified)**	Advise on, arrange or provide social support *(e.g. from friends, relatives, colleagues,' buddies' or staff)* or non-contingent praise or reward for performance of the behavior. It includes encouragement and counselling, but only when it is directed at the **behavior** *Note: attending a group class and/or mention of 'follow-up' does not necessarily apply this BCT, support must be explicitly mentioned; if practical, code **3.2, Social support (practical)**; if emotional, code **3.3, Social support (emotional)** (includes '**Motivational interviewing**' and '**Cognitive Behavioral Therapy**')*	Advise the person to call a 'buddy' when they experience an urge to smoke Arrange for a housemate to encourage continuation with the behavior change programme Give information about a self-help group that offers support for the behaviour

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3.2	*Social support (practical)*	Advise on, arrange, or provide **practical** help *(e.g. from friends, relatives, colleagues, 'buddies' or staff)* for performance of the behavior *Note: if emotional, code **3.3, Social support (emotional)**; if general or unspecified, code **3.1, Social support (unspecified)** If only restructuring the physical environment or adding objects to the environment, code **12.1, Restructuring the physical environment** or **12.5, Adding objects to the environment;** attending a group or class and/or mention of 'follow-up' does not necessarily apply this BCT, support must be explicitly mentioned.*	Ask the partner of the patient to put their tablet on the breakfast tray so that the patient remembers to take it
3.3	*Social support (emotional)*	Advise on, arrange, or provide **emotional** social support *(e.g. from friends, relatives, colleagues, 'buddies' or staff)* for performance of the behavior *Note: if practical, code **3.2, Social support (practical)**; if unspecified, code **3.1, Social support (unspecified)***	Ask the patient to take a partner or friend with them to their colonoscopy appointment
4. Shaping knowledge			
4.1	*Instruction on how to perform a behavior*	Advise or agree on how to perform the behavior (includes '**Skills training**') *Note: when the person attends classes such as exercise or cookery, code **4.1, Instruction on how to perform the behavior, 8.1, Behavioral practice/rehearsal** and **6.1, Demonstration of the behavior***	Advise the person how to put a condom on a model of a penis correctly
4.2	*Information about antecedents*	Provide information about antecedents *(e.g. social and environmental situations and events, emotions, cognitions)* that reliably predict performance of the behaviour	Advise to keep a record of snacking and of situations or events occurring prior to snacking
4.3	*Re-attribution*	Elicit perceived causes of behavior and suggest alternative explanations *(e.g. external or internal and stable or unstable)*	If the person attributes their over-eating to the frequent presence of delicious food, suggest that the 'real' cause may be the person's inattention to bodily signals of hunger and satiety
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4.4	*Behavioral experiments*	Advise on how to identify and test hypotheses about the behavior, its causes and consequences, by collecting and interpreting data	Ask a family physician to give evidence-based advice rather than prescribe antibiotics and to note whether the patients are grateful or annoyed
5. Natural consequences			
5.1	*Information about health consequences*	Provide information (e.g. written, verbal, visual) about health consequences of performing the behavior *Note: consequences can be for any target, not just the recipient(s) of the intervention; emphasising importance of consequences is not sufficient; if information about emotional consequences, code **5.6, Information about emotional consequences**; if about social, environmental or unspecified consequences code **5.3, Information about social and environmental consequences***	Explain that not finishing a course of antibiotics can increase susceptibility to future infection Present the likelihood of contracting a sexually transmitted infection following unprotected sexual behavior
5.2	*Salience of consequences*	Use methods specifically designed to **emphasise** the consequences of performing the behaviour with the aim of making them more memorable (goes beyond informing about consequences) *Note: if information about consequences, also code **5.1, Information about health consequences, 5.6, Information about emotional consequences** or **5.3, Information about social and environmental consequences***	Produce cigarette packets showing pictures of health consequences e.g. diseased lungs, to highlight the dangers of continuing to smoke
5.3	*Information about social and environmental consequences*	Provide information (e.g. written, verbal, visual) about social and environmental consequences of performing the behavior *Note: consequences can be for any target, not just the recipient(s) of the intervention; if information about health or consequences, code **5.1, Information about health consequences**; if about emotional consequences, code **5.6, Information about emotional consequences**; if unspecified, code **5.3, Information about social and environmental consequences***	Tell family physician about financial remuneration for conducting health screening Inform a smoker that the majority of people disapprove of smoking in public places
5.4	*Monitoring of emotional consequences*	Prompt assessment of **feelings** after attempts at performing the behavior	Agree that the person will record how they feel after taking their daily walk
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5.5	*Anticipated regret*	Induce or raise awareness of expectations of future regret about performance of the unwanted behavior *Note: not including **5.6, Information about emotional consequences**; if suggests adoption of a perspective or new perspective in order to change cognitions also code **13.2, Framing/reframing***	Ask the person to assess the degree of regret they will feel if they do not quit smoking
5.6	*Information about emotional consequences*	Provide information (e.g. written, verbal, visual) about emotional consequences of performing the behavior *Note: consequences can be related to emotional health disorders (e.g. depression, anxiety) and/or states of mind (e.g. low mood, stress); not including **5.5, Anticipated regret**; consequences can be for any target, not just the recipient(s) of the intervention; if information about health consequences code **5.1, Information about health consequences**; if about social, environmental or unspecified code **5.3, Information about social and environmental consequences***	Explain that quitting smoking increases happiness and life satisfaction
6. Comparison of behaviour			
6.1	*Demonstration of the behavior*	Provide an observable sample of the performance of the behaviour, directly in person or indirectly e.g. via film, pictures, for the person to aspire to or imitate (includes '**Modelling**'). *Note: if advised to practice, also code, **8.1, Behavioural practice and rehearsal;** If provided with instructions on how to perform, also code **4.1, Instruction on how to perform the behaviour***	Demonstrate to nurses how to raise the issue of excessive drinking with patients via a role-play exercise
6.2	*Social comparison*	Draw attention to others' performance to allow comparison with the person's own performance *Note: being in a group setting does not necessarily mean that social comparison is actually taking place*	Show the doctor the proportion of patients who were prescribed antibiotics for a common cold by other doctors and compare with their own data
6.3	*Information about others' approval*	Provide information about what other people think about the behavior. The information clarifies whether others will like, approve or disapprove of what the person is doing or will do	Tell the staff at the hospital ward that staff at all other wards approve of washing their hands according to the guidelines

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7. Associations			
7.1	*Prompts/cues*	Introduce or define environmental or social stimulus with the purpose of prompting or cueing the behavior. The prompt or cue would normally occur at the time or place of performance *Note: when a stimulus is linked to a specific action in an if-then plan including one or more of frequency, duration or intensity <u>also</u> code* **1.4, Action planning**.	Put a sticker on the bathroom mirror to remind people to brush their teeth
7.2	*Cue signalling reward*	Identify an environmental stimulus that reliably predicts that reward will follow the behavior (includes **'<u>Discriminative cue</u>'**)	Advise that a fee will be paid to dentists for a particular dental treatment of 6-8 year old, but not older, children to encourage delivery of that treatment (the 6-8 year old children are the environmental stimulus)
7.3	*Reduce prompts/cues*	Withdraw gradually prompts to perform the behavior (includes **'<u>Fading</u>'**)	Reduce gradually the number of reminders used to take medication
7.4	*Remove access to the reward*	Advise or arrange for the person to be separated from situations in which unwanted behavior can be rewarded in order to reduce the behavior (includes **'<u>Time out</u>'**)	Arrange for cupboard containing high calorie snacks to be locked for a specified period to reduce the consumption of sugary foods in between meals
7.5	*Remove aversive stimulus*	Advise or arrange for the removal of an aversive stimulus to facilitate behavior change (includes **'<u>Escape learning</u>'**)	Arrange for a gym-buddy to stop nagging the person to do more exercise in order to increase the desired exercise behaviour
7.6	*Satiation*	Advise or arrange repeated exposure to a stimulus that reduces or extinguishes a drive for the unwanted behavior	Arrange for the person to eat large quantities of chocolate, in order to reduce the person's appetite for sweet foods
7.7	*Exposure*	Provide systematic confrontation with a feared stimulus to reduce the response to a later encounter	Agree a schedule by which the person who is frightened of surgery will visit the hospital where they are scheduled to have surgery
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7.8	*Associative learning*	Present a neutral stimulus jointly with a stimulus that already elicits the behavior repeatedly until the neutral stimulus elicits that behavior (includes **'Classical/Pavlovian Conditioning'**) *Note: when a BCT involves reward or punishment, code one or more of:* **10.2, Material reward (behavior); 10.3, Non-specific reward; 10.4, Social reward, 10.9, Self-reward; 10.10, Reward (outcome)**	Present repeatedly fatty foods with a disliked sauce to discourage the consumption of fatty foods
8. Repetition and substitution			
8.1	*Behavioral practice/ rehearsal*	Prompt practice or rehearsal of the performance of the behavior one or more times in a context or at a time when the performance may not be necessary, in order to increase habit and skill *Note: if aiming to associate performance with the context, __also__ code **8.3, Habit formation***	Prompt asthma patients to practice measuring their peak flow in the nurse's consulting room
8.2	*Behavior substitution*	Prompt substitution of the unwanted behavior with a wanted or neutral behavior *Note: if this occurs regularly, __also__ code **8.4, Habit reversal***	Suggest that the person goes for a walk rather than watches television
8.3	*Habit formation*	Prompt rehearsal and repetition of the behavior in the same context repeatedly so that the context elicits the behavior *Note: __also__ code **8.1, Behavioral practice/rehearsal***	Prompt patients to take their statin tablet before brushing their teeth every evening
8.4	*Habit reversal*	Prompt rehearsal and repetition of an alternative behavior to **replace** an unwanted habitual behavior *Note: __also__ code **8.2, Behavior substitution***	Ask the person to walk up stairs at work where they previously always took the lift
8.5	*Overcorrection*	Ask to repeat the wanted behavior in an exaggerated way following an unwanted behaviour	Ask to eat _only_ fruit and vegetables the day after a poor diet
8.6	*Generalisation of a target behavior*	Advise to perform the wanted behaviour, which is already performed in a particular situation, in another situation	Advise to repeat toning exercises learned in the gym when at home

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8.7	*Graded tasks*	Set easy-to-perform tasks, making them increasingly difficult, but achievable, until behavior is performed	Ask the person to walk for 100 yards a day for the first week, then half a mile a day after they have successfully achieved 100 yards, then two miles a day after they have successfully achieved one mile
9. Comparison of outcomes			
9.1	*Credible source*	Present verbal or visual communication from a **credible source** in favour of or against the behavior *Note: code this BCT if source generally agreed on as credible e.g., health professionals, celebrities or words used to indicate expertise or leader in field and if the communication has the aim of persuading; if information about health consequences, also code 5.1, Information about health consequences, if about emotional consequences, also code 5.6, Information about emotional consequences; if about social, environmental or unspecified consequences also code 5.3, Information about social and environmental consequences*	Present a speech given by a high status professional to emphasise the importance of not exposing patients to unnecessary radiation by ordering x-rays for back pain
9.2	*Pros and cons*	Advise the person to identify and compare reasons for wanting (pros) and not wanting to (cons) change the behavior (includes '**Decisional balance'**) *Note: if providing information about health consequences, also code 5.1, Information about health consequences; if providing information about emotional consequences, also code 5.6, Information about emotional consequences; if providing information about social, environmental or unspecified consequences also code 5.3, Information about social and environmental consequences*	Advise the person to list and compare the advantages and disadvantages of prescribing antibiotics for upper respiratory tract infections
9.3	*Comparative imagining of future outcomes*	Prompt or advise the imagining and comparing of future outcomes of changed versus unchanged behaviour	Prompt the person to imagine and compare likely or possible outcomes following attending versus not attending a screening appointment
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10. Reward and threat			
10.1	*Material incentive (behavior)*	Inform that money, vouchers or other valued objects **will be** delivered if and only if there has been effort and/or progress in performing the behavior (includes **'Positive reinforcement'**) *Note: if incentive is social, code **10.5, Social incentive** if unspecified code **10.6, Non-specific incentive**, and not **10.1, Material incentive (behavior)**; if incentive is for **outcome**, code **10.8, Incentive (outcome).** If reward is delivered also code one of: **10.2, Material reward (behavior); 10.3, Non-specific reward; 10.4, Social reward, 10.9, Self-reward; 10.10, Reward (outcome)***	Inform that a financial payment will be made each month in pregnancy that the woman has not smoked
10.2	*Material reward (behavior)*	Arrange for the delivery of money, vouchers or other valued objects if and only if there **has been** effort and/or progress in performing the behavior (includes '**Positive reinforcement'**) *Note: If reward is social, code **10.4, Social reward**, if unspecified code **10.3, Non-specific reward**, and not **10.1, Material reward (behavior)**; if reward is for **outcome**, code **10.10, Reward (outcome).** If informed of reward in advance of rewarded behaviour, also code one of: **10.1, Material incentive (behaviour); 10.5, Social incentive; 10.6, Non-specific incentive; 10.7, Self-incentive; 10.8, Incentive (outcome)***	Arrange for the person to receive money that would have been spent on cigarettes if and only if the smoker has not smoked for one month
10.3	*Non-specific reward*	Arrange delivery of a reward if and only if there **has been** effort and/or progress in performing the behavior (includes **'Positive reinforcement'**) *Note: if reward is material, code **10.2, Material reward (behavior)**, if social, code **10.4, Social reward**, and not **10.3, Non-specific reward**; if reward is for **outcome** code **10.10, Reward (outcome).** If informed of reward in advance of rewarded behaviour, also code one of: **10.1, Material incentive (behaviour); 10.5, Social incentive; 10.6, Non-specific incentive; 10.7, Self-incentive; 10.8, Incentive (outcome)***	Identify something (e.g. an activity such as a visit to the cinema) that the person values and arrange for this to be delivered if and only if they attend for health screening
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10.4	*Social reward*	Arrange verbal or non-verbal reward if and only if there *has been* effort and/or progress in performing the behavior (includes '**Positive reinforcement**') *Note: if reward is material, code **10.2, Material reward (behavior)**, if unspecified code **10.3, Non-specific reward**, and not **10.4, Social reward**; if reward is for **outcome** code **10.10, Reward (outcome).** If informed of reward in advance of rewarded behaviour, also code one of: **10.1, Material incentive (behaviour); 10.5, Social incentive; 10.6, Non-specific incentive; 10.7, Self-incentive; 10.8, Incentive (outcome)***	Congratulate the person for each day they eat a reduced fat diet
10.5	*Social incentive*	Inform that a verbal or non-verbal reward *will be* delivered if and only if there has been effort and/or progress in performing the behavior (includes '**Positive reinforcement'**) *Note: if incentive is material, code **10.1, Material incentive (behavior)**, if unspecified code **10.6, Non-specific incentive**, and not **10.5, Social incentive**; if incentive is for **outcome** code **10.8, Incentive (outcome).** If reward is delivered also code one of: **10.2, Material reward (behavior); 10.3, Non-specific reward; 10.4, Social reward, 10.9, Self-reward; 10.10, Reward (outcome)***	Inform that they will be congratulated for each day they eat a reduced fat diet
10.6	*Non-specific incentive*	Inform that a reward *will be* delivered if and only if there has been effort and/or progress in performing the behavior (includes '**Positive reinforcement'**) *Note: if incentive is material, code **10.1, Material incentive (behavior)**, if social, code **10.5, Social incentive** and not **10.6, Non-specific incentive**; if incentive is for **outcome** code **10.8, Incentive (outcome).** If reward is delivered also code one of: **10.2, Material reward (behavior); 10.3, Non-specific reward; 10.4, Social reward, 10.9, Self-reward; 10.10, Reward (outcome)***	Identify an activity that the person values and inform them that this will happen if and only if they attend for health screening

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10.7	*Self-incentive*	Plan to reward self in future if and only if there has been effort and/or progress in performing the behavior *Note: if self-reward is material, <u>also</u> code 10.1, Material incentive (behavior), if social, <u>also</u> code 10.5, Social incentive, if unspecified, <u>also</u> code 10.6, Non-specific incentive; if incentive is for outcome code 10.8, Incentive (outcome). If reward is delivered also code one of: 10.2, Material reward (behavior); 10.3, Non-specific reward; 10.4, Social reward, 10.9, Self-reward; 10.10, Reward (outcome)*	Encourage to provide self with material (e.g., new clothes) or other valued objects if and only if they have adhered to a healthy diet
10.8	*Incentive (outcome)*	Inform that a reward **will be** delivered if and only if there has been effort and/or progress in achieving the behavioural **outcome** (*includes '<u>Positive reinforcement</u>'*) *Note: this includes social, material, self- and non-specific incentives for outcome; if incentive is for the behavior code 10.5, Social incentive, 10.1, Material incentive (behavior), 10.6, Non-specific incentive or 10.7, Self-incentive and <u>not</u> 10.8, Incentive (outcome). If reward is delivered also code one of: 10.2, Material reward (behavior); 10.3, Non-specific reward; 10.4, Social reward, 10.9, Self-reward; 10.10, Reward (outcome)*	Inform the person that they will receive money if and only if a certain amount of weight is lost
10.9	*Self-reward*	Prompt self-praise or self-reward if and only if there **has been** effort and/or progress in performing the behavior *Note: if self-reward is material, <u>also</u> code 10.2, Material reward (behavior), if social, <u>also</u> code 10.4, Social reward, if unspecified, <u>also</u> code 10.3, Non-specific reward; if reward is for outcome code 10.10, Reward (outcome). If informed of reward in advance of rewarded behaviour, also code one of: 10.1, Material incentive (behaviour); 10.5, Social incentive; 10.6, Non-specific incentive; 10.7, Self-incentive; 10.8, Incentive (outcome)*	Encourage to reward self with material (e.g., new clothes) or other valued objects if and only if they have adhered to a healthy diet

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10.10	*Reward (outcome)*	Arrange for the delivery of a reward if and only if there **has been** effort and/or progress in achieving the behavioral **outcome** (includes '**Positive reinforcement**') *Note: this includes social, material, self- and non-specific rewards for outcome; if reward is for the **behavior** code 10.4, **Social reward, 10.2, Material reward (behavior), 10.3, Non-specific reward** or 10.9, **Self-reward** and not 10.10, **Reward (outcome).** If informed of reward in advance of rewarded behaviour, also code one of: 10.1, Material incentive (behaviour); 10.5, Social incentive; 10.6, Non-specific incentive; 10.7, Self-incentive; 10.8, Incentive (outcome)*	Arrange for the person to receive money if and only if a certain amount of weight is lost
10.11	*Future punishment*	Inform that future punishment or removal of reward will be a consequence of performance of an unwanted behavior (may include fear arousal) (includes '**Threat**')	Inform that continuing to consume 30 units of alcohol per day is likely to result in loss of employment if the person continues
11. Regulation			
11.1	*Pharmacological support*	Provide, or encourage the use of or adherence to, drugs to facilitate behavior change *Note: if pharmacological support to reduce negative emotions (i.e. anxiety) then also code **11.2, Reduce negative emotions***	Suggest the patient asks the family physician for nicotine replacement therapy to facilitate smoking cessation
11.2	*Reduce negative emotions* [b]	Advise on ways of reducing negative emotions to facilitate performance of the behavior (includes '**Stress Management**') *Note: if includes analysing the behavioural problem, also code **1.2, Problem solving***	Advise on the use of stress management skills, e.g. to reduce anxiety about joining Alcoholics Anonymous
11.3	*Conserving mental resources*	Advise on ways of minimising demands on mental resources to facilitate behavior change	Advise to carry food calorie content information to reduce the burden on memory in making food choices
11.4	*Paradoxical instructions*	Advise to engage in some form of the unwanted behavior with the aim of reducing motivation to engage in that behaviour	Advise a smoker to smoke twice as many cigarettes a day as they usually do Tell the person to stay awake as long as possible in order to reduce insomnia
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12. Antecedents			
12.1	*Restructuring the physical environment*	Change, or advise to change the **physical** environment in order to facilitate performance of the wanted behavior or create barriers to the unwanted behavior (other than prompts/cues, rewards and punishments) *Note: this may also involve **12.3, Avoidance/reducing exposure to cues for the behavior**; if restructuring of the social environment code **12.2, Restructuring the social environment**;* *if only adding objects to the environment, code **12.5, Adding objects to the environment***	Advise to keep biscuits and snacks in a cupboard that is inconvenient to get to Arrange to move vending machine out of the school
12.2	*Restructuring the social environment*	Change, or advise to change the **social** environment in order to facilitate performance of the wanted behavior or create barriers to the unwanted behavior (other than prompts/cues, rewards and punishments) *Note: this may also involve **12.3, Avoidance/reducing exposure to cues for the behavior**; if also restructuring of the physical environment also code **12.1, Restructuring the physical environment***	Advise to minimise time spent with friends who drink heavily to reduce alcohol consumption
12.3	*Avoidance/reducing exposure to cues for the behavior*	Advise on how to avoid exposure to specific social and contextual/physical cues for the behavior, including changing daily or weekly routines *Note: this may also involve **12.1, Restructuring the physical environment** and/or **12.2, Restructuring the social environment**; if the BCT includes analysing the behavioral problem, <u>only</u> code **1.2, Problem solving***	Suggest to a person who wants to quit smoking that their social life focus on activities other than pubs and bars which have been associated with smoking
12.4	*Distraction*	Advise or arrange to use an alternative focus for attention to avoid triggers for unwanted behaviour	Suggest to a person who is trying to avoid between-meal snacking to focus on a topic they enjoy (e.g. holiday plans) instead of focusing on food
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12.5	**Adding objects to the environment**	Add objects to the environment in order to facilitate performance of the behavior *Note: Provision of information (e.g. written, verbal, visual) in a booklet or leaflet is insufficient. If this is accompanied by social support, also code **3.2, Social support (practical)**; if the environment is changed beyond the addition of objects, also code **12.1, Restructuring the physical environment***	Provide free condoms to facilitate safe sex Provide attractive toothbrush to improve tooth brushing technique
12.6	**Body changes**	Alter body structure, functioning or support **directly** to facilitate behavior change	Prompt strength training, relaxation training or provide assistive aids (e.g. a hearing aid)

13. Identity

13.1	**Identification of self as role model**	Inform that one's own behavior may be an example to others	Inform the person that if they eat healthily, that may be a good example for their children
13.2	**Framing/reframing**	Suggest the deliberate adoption of a perspective or new perspective on behavior (e.g. its purpose) in order to change cognitions or emotions about performing the behavior (includes '**Cognitive structuring**'); *If information about consequences then code **5.1, Information about health consequences, 5.6, Information about emotional consequences** or **5.3, Information about social and environmental consequences** instead of **13.2, Framing/reframing***	Suggest that the person might think of the tasks as reducing sedentary behavior (rather than increasing activity)
13.3	**Incompatible beliefs**	Draw attention to discrepancies between current or past behavior and self-image, in order to create discomfort (includes **'Cognitive dissonance'**)	Draw attention to a doctor's liberal use of blood transfusion and their self-identification as a proponent of evidence-based medical practice
13.4	**Valued self-identity**	Advise the person to write or complete rating scales about a cherished value or personal strength as a means of affirming the person's identity as part of a behavior change strategy (includes **'Self-affirmation'**)	Advise the person to write about their personal strengths before they receive a message advocating the behavior change
13.5	**Identity associated with changed behavior**	Advise the person to construct a new self-identity as someone who 'used to engage with the unwanted behavior'	Ask the person to articulate their new identity as an 'ex-smoker'

14. Scheduled consequences			
14.1	*Behavior cost*	Arrange for withdrawal of something valued if and only if an unwanted behavior is performed (includes '**Response cost'**). Note if withdrawal of contingent reward code, *14.3, Remove reward*	Subtract money from a prepaid refundable deposit when a cigarette is smoked
14.2	*Punishment*	Arrange for aversive consequence contingent on the performance of the unwanted behavior	Arrange for the person to wear unattractive clothes following consumption of fatty foods
14.3	*Remove reward*	Arrange for discontinuation of contingent reward following performance of the unwanted behavior (includes **'Extinction'**)	Arrange for the other people in the household to ignore the person every time they eat chocolate (rather than attending to them by criticising or persuading)
14.4	*Reward approximation*	Arrange for reward following any approximation to the target behavior, gradually rewarding only performance closer to the wanted behavior (includes **'Shaping'**) *Note: also code one of 59-63*	Arrange reward for any reduction in daily calories, gradually requiring the daily calorie count to become closer to the planned calorie intake
14.5	*Rewarding completion*	Build up behavior by arranging reward following final component of the behavior; gradually add the components of the behavior that occur earlier in the behavioral sequence (includes **'Backward chaining'**) *Note: also code one of 10.2, Material reward (behavior); 10.3, Non-specific reward; 10.4, Social reward, 10.9, Self-reward; 10.10, Reward (outcome)*	Reward eating a supplied low calorie meal; then make reward contingent on cooking and eating the meal; then make reward contingent on purchasing, cooking and eating the meal
14.6	*Situation-specific reward*	Arrange for reward following the behavior in one situation but not in another (includes **'Discrimination training'**) *Note: also code one of 10.2, Material reward (behavior); 10.3, Non-specific reward; 10.4, Social reward, 10.9, Self-reward; 10.10, Reward (outcome)*	Arrange reward for eating at mealtimes but not between meals
14.7	*Reward incompatible behavior*	Arrange reward for responding in a manner that is incompatible with a previous response to that situation (includes **'Counter-conditioning'**) *Note: also code one of 10.2, Material reward (behavior); 10.3, Non-specific reward; 10.4, Social reward, 10.9, Self-reward; 10.10, Reward (outcome)*	Arrange reward for ordering a soft drink at the bar rather than an alcoholic beverage
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14.8	*Reward alternative behavior*	Arrange reward for performance of an alternative to the unwanted behavior (includes **'Differential reinforcement'**) *Note: also code one of 10.2, Material reward (behavior); 10.3, Non-specific reward; 10.4, Social reward, 10.9, Self-reward; 10.10, Reward (outcome); consider also coding 1.2, Problem solving*	Reward for consumption of low fat foods but not consumption of high fat foods
14.9	*Reduce reward frequency*	Arrange for rewards to be made contingent on increasing duration or frequency of the behavior (includes **'Thinning'**) *Note: also code one of 10.2, Material reward (behavior); 10.3, Non-specific reward; 10.4, Social reward, 10.9, Self-reward; 10.10, Reward (outcome)*	Arrange reward for each day without smoking, then each week, then each month, then every 2 months and so on
14.10	*Remove punishment*	Arrange for removal of an unpleasant consequence contingent on performance of the wanted behavior (includes **'Negative reinforcement'**)	Arrange for someone else to do housecleaning only if the person has adhered to the medication regimen for a week

15. Self-belief

15.1	*Verbal persuasion about capability*	Tell the person that they can successfully perform the wanted behavior, arguing against self-doubts and asserting that they can and will succeed	Tell the person that they can successfully increase their physical activity, despite their recent heart attack.
15.2	*Mental rehearsal of successful performance*	Advise to practise imagining performing the behavior successfully in relevant contexts	Advise to imagine eating and enjoying a salad in a work canteen
15.3	*Focus on past success*	Advise to think about or list previous successes in performing the behavior (or parts of it)	Advise to describe or list the occasions on which the person had ordered a non-alcoholic drink in a bar
15.4	*Self-talk*	Prompt positive self-talk (aloud or silently) before and during the behavior	Prompt the person to tell themselves that a walk will be energising

16. Covert learning

16.1	*Imaginary punishment*	Advise to imagine performing the **unwanted** behavior in a real-life situation followed by imagining an unpleasant consequence (includes **'Covert sensitisation'**)	Advise to imagine overeating and then vomiting

16.2	*Imaginary reward*	Advise to imagine performing the **wanted** behavior in a real-life situation followed by imagining a pleasant consequence (includes **'Covert conditioning'**)	Advise the health professional to imagine giving dietary advice followed by the patient losing weight and no longer being diabetic
16.3	*Vicarious consequences*	Prompt observation of the consequences (including rewards and punishments) for others when they perform the behavior *Note: if observation of health consequences, also code* **5.1, Information about health consequences**; *if of emotional consequences, also code* **5.6, Information about emotional consequences**, *if of social, environmental or unspecified consequences, also code* **5.3, Information about social and environmental consequences**	Draw attention to the positive comments other staff get when they disinfect their hands regularly
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[a] Notes are provided underneath most BCTs to help distinguish them from similar techniques

[b] An additional technique 'Increase positive emotions' will be included in BCT Taxonomy v2