

The Evil Bird and the Right to Disconnect: Children’s Vulnerability to Exit Dark Patterns in Gamified Educational Apps

ANONYMOUS AUTHOR(S)

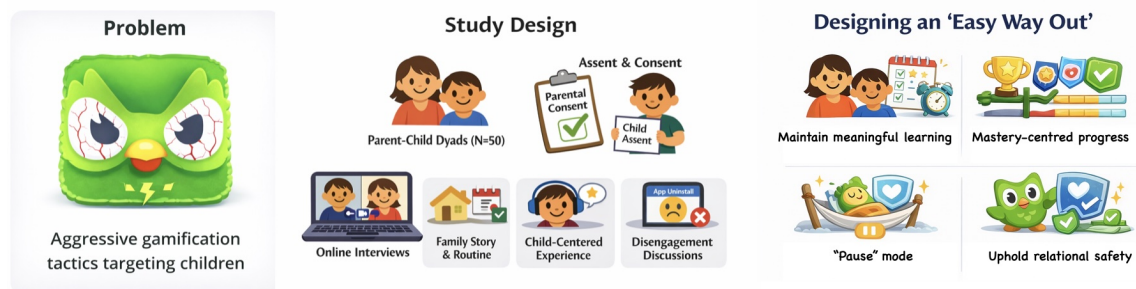


Fig. 1. **Overview of the research.** **Left:** A moody Duo, the main mascot of Duolingo, displaying negative affect when users (children) break a daily streak, thereby pressuring them to sustain engagement even when educational meaning diminished. **Center:** The methodological design addressing research questions, exploring harms from the retention-oriented gamification design. **Right:** Key findings of the study, positioning an “easy way out” as a central design principle for child-facing educational apps.

Gamified educational apps, widely used by children, are often celebrated for sustaining daily practice. Yet such engagement can conceal a problematic outcome: continued use that no longer supports meaningful learning but is difficult to pause or quit. This paper examines how retention-oriented gamification can harm children’s wellbeing and learning through exit dark patterns—design strategies that increase the cognitive and emotional costs of disengagement. Drawing on online interviews with North American parent–child dyads, we examine families’ daily use of a mainstream gamified language-learning app (Duolingo) as an emblematic case. Our findings introduce two analytic constructs: goal drift, in which engagement shifts from mastery-oriented learning to metric maintenance, and gamified obligation, characterized by guilt or disappointment associated with exiting. We further show how exit friction stabilizes engagement even as educational meaning wanes. We conclude with design implications for child-centered learning technologies, arguing for an “easy way out” as learning-supportive design.

Additional Key Words and Phrases: children; gamification; dark patterns; deceptive design; digital wellbeing; disengagement; Duolingo; right to disconnect; educational technology

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1 Introduction

“It’s like we can’t leave in peace.”

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53 A parent said, reflecting on her child’s experience with Duolingo ¹, the gamified language-learning app that continued
54 sending “it misses you” emails even after the family uninstalled it. The story started with her nine-year-old’s goal to
55 learn French for school. Before long, the family’s days were filled with short lessons, playful animations, frequent praise,
56 and the cheerful green owl (Duo) celebrating every session completion. With daily practice, progress came steadily, and
57 the routine felt reassuring - exactly the kind of consistent learning pattern the parent had hoped for. However, over
58 time, the child’s goal quietly shifted. Learning French became secondary to protecting a daily streak. When lessons felt
59 effortful, they gravitated toward easier content just to keep the counter active. When the parent suggested a break, the
60 child blurted out, “*I can’t lose my streak!*” as if stopping wasn’t an option. “*Duo will be sad,*” the child added, visibly
61 upset by the thought of letting someone down.
62

64 Drawing on such lived experiences, this paper examines what happens when educational apps are designed to be
65 difficult to stop, offering children and families “no easy way out”. Children’s educational technologies are increasingly
66 evaluated through engagement metrics, such as daily use, retention, streak length, time-on-task, because they are
67 measurable and align with platform incentives [13]. Yet in children’s learning contexts, engagement is not a sufficient
68 proxy for educational value. Learning requires challenge, errors, recovery, and reflection [24, 25, 32]; it also requires
69 autonomy, including the ability to pause [9, 40]. When continued use is sustained through anxiety, manipulative design,
70 or exit friction, retention becomes a misleading indicator of success, one that can mask harms borne by children
71 and families: bedtime conflict, emotional escalation, time displaced from other meaningful activities, and a gradual
72 redefinition of what “progress” is taken to mean.
73

75 Duolingo offers a consequential site for this inquiry because it operates on a massive scale and publicly promotes its
76 streak-based retention design. In annual reporting, Duolingo highlights that millions of users maintain long streaks,
77 including year-long streaks, positioning streaks as a central mechanic that drives engagement at the platform scale
78 [13, 23]. Child use is also not incidental. Public-facing safety guidance suggests that Duolingo is intended for users of
79 all ages, with no stated minimum age, and that learners under 13 receive a more protected account experience (e.g.,
80 private profiles and reduced access to certain features). Likewise, third-party privacy evaluation notes child-specific
81 considerations and parental consent practices for minors under 13 [10]. These measures signal explicit accommodations
82 for younger children [3]. Despite this, the app rarely discloses how stopping and leaving are actually experienced in
83 families, especially when manipulated retention mechanisms are framed as learning motivation.
84

87 Building on Hirsh-Pasek, Zosh, et al.’s Four Pillars of Learning [21], this research conceptualizes meaningful learning
88 as experiences that “occur when children find the meaning in what they are learning and are able to not only connect
89 new material to existing knowledge but expand their current knowledge to create new conceptual understanding” [p.4].
90 We focus on children aged 6–12, a middle-childhood period in which children increasingly use apps independently and
91 readily internalize rule-based systems (e.g., streaks and loss conditions) and character-based social cues, yet their ability
92 to recognize and resist persuasive intent is still developing [7, 38, 45]. This makes middle childhood a critical period in
93 which “no easy way out” design can shape not only children’s behaviour (e.g., continued use) but also develop their
94 beliefs about obligations, alternatives (or user agency), and what it means to stop.
95

97 To better understand this user experience issue, this research explores three research questions (RQs) that treat app
98 disengagement as a lived family process rather than a single “quit” event:

99 **RQ1.** How do children interpret gamified engagement mechanics, especially with Duo?

100 **RQ2.** How do children and parents attempt to disengage, and what frictions appear across exit pathways?
101

102
103 ¹<https://www.duolingo.com>

105 **RQ3.** How does sustained gamified engagement interact with learning goals over time, and what design strategies
106 can support meaningful learning while enabling a smooth exit?

107 Across online interviews with parent–child dyads in Canada and the United States, families repeatedly described a
108 paradox. Gamification can sustain long-term engagement. But in many households, the very mechanisms that kept
109 children coming back also reshaped the definition of engagement. We identified a central pattern in these accounts as
110 *goal drift*: children began with an educational intent (e.g., learning a new language for school) but gradually shifted
111 toward attending to platform-defined metrics. They remained “active daily use” while avoiding challenges. Such
112 performative engagements are categorized by switching to easier languages, repeating low-effort lessons, and migrating
113 to alternative in-app content that preserves streak continuity.

114 At the same time, *gamified obligation* was carried out by the lively “evil bird”. Many children treated the owl not as a
115 mere mascot but as a social actor that could be pleased, disappointed, or angered, whose tone or presence could feel
116 coercive rather than supportive. More broadly, families’ accounts suggest that when children experienced a learning
117 mascot as a relational other, exit became a socially and morally charged act. As a result, parents invested increasing
118 efforts into boundary work — negotiating routines, managing notifications, and repairing conflicts. Thus, what appears
119 as retention success at the platform level can become a learning and wellbeing harm at the family level.

120 Our analysis, therefore, foregrounds mechanism. We use *exit dark patterns* to address design strategies that raise the
121 costs of pausing, reducing use, or leaving, including loss-framed continuity mechanics, persistent reminders, distributed
122 settings that fragment exit across channels, and re-engagement messages that continue after uninstall. In adult contexts,
123 these patterns are often discussed as obstruction or nagging. In child contexts, they become more influential. A “it
124 misses you” email that may register as a marketing tactic to adults can be interpreted by children as interpersonal
125 communication that reactivates emotional attachment and undermines parents’ efforts to reset routines.

126 Our contributions are threefold. First, we provide an empirical, child-centered account of how retention-oriented
127 gamification in a mainstream educational app can produce learning and wellbeing harms, including mastery avoidance,
128 continuity anxiety, time displacement, and intensified boundary work, as well as family conflicts. Second, we introduce
129 two analytic constructs — *goal drift* and *gamified obligation* — to explain how children produce performative engagements
130 even as educational value erodes. We then elaborate on character-mediated retention, exit friction, and app monetization
131 practices that exploit gamified obligation. Third, we derive design implications for child-centered educational apps that
132 treat an “easy way out” as learning-supportive infrastructure, such as recognition pause states, default contact cessation
133 after uninstall, age-sensitive de-gamification of loss-framing, and safeguards against guardian bypass in monetization.

142 2 Related Work

143 Our work sits at the intersection of research on (1) deceptive design and exit friction, (2) children’s digital wellbeing
144 and the family efforts to disengage, and (3) gamification and socially persuasive mechanisms in child-facing learning
145 technologies. Across these areas, previous work offers strong vocabularies for naming manipulation, rich accounts of
146 why “stopping” is emotionally and relationally complex in families, as well as long-standing theories of how rewards
147 and social cues shape motivation and compliance. Yet, these literatures are rarely brought together to explain a specific
148 phenomenon we foreground: in child-facing learning ecosystems, retention-oriented gamification can function as a
149 mechanism that makes disengagement and discontinuity cognitively confusing and emotionally charged. This design
150 mechanism produces ongoing performative engagements that appear successful in platform metrics, but are misaligned
151 with children’s learning motivations and autonomy.

2.1 Deceptive design, retention, and exit friction

Dark patterns have become a central term for human-computer interaction (HCI) scholars to describe interface designs that obscure alternatives, create cognitive biases, or increase the cost of refusal to steer users toward decisions against their best interests [6, 15, 17, 29, 34, 47, 52]. Large-scale audits show that such patterns are widespread on commercial websites and commonly include categories that map directly onto “no easy way out,” such as obstruction, nagging, and forced action [31]. Related work in consumer protection and legal scholarship similarly emphasize that subtle forms of choice architecture can materially change what people end up doing — especially when cancellation and reversal are made frictionful or confusing [30]. In this framing, exit is not a neutral usability moment; it is a site where manipulative design is enacted. *Easy entry, hard exit* transforms continued engagements from a conscious decision into an inertia-laden default.

Recent HCI work has sharpened this critique by focusing specifically on subscription cancellation or “roach motel” experiences — flows that make it simple to enroll but difficult to leave [16, 36, 50]. Exit friction, as these studies indicate, not only demands additional procedural efforts but also easily frustrates users. While much of this literature focuses on adult consumers, it provides a useful lens for child-facing services because it clarifies that friction can be strategically designed, not incidental. The designs may lean on repeated prompts and social pressure to make leaving feel like giving something up, not merely stopping.

Game studies and design ethics add a complementary vocabulary for manipulative retention [26, 37]. Zagal et al. [58] describe dark patterns in game design as recurring tactics that encourage continued play or spending through mechanisms such as grinding, scarcity, and loss aversion. These strategies are relevant because many child learning apps increasingly resemble games in their reward schedules and progression systems [33]. Fitton and Read’s ADD framework (App Dark Design) [14] is particularly influential within the Interaction Design and Children (IDC) community for surfacing how free-to-play logics can normalize retention-first incentives under playful presentation, and for making “dark design” discussable as a set of evaluative concerns rather than a vague moral accusation. This work matters for our study because it suggests that what appears as “motivational design” can become manipulative when it restricts exit, leverages emotional pressure, or exploits developmental vulnerabilities.

Child-specific deceptive design research further complicates the picture: children may have fewer resources to detect persuasive intent and fewer meaningful ways to refuse, especially when designs are embedded in routine and mediated by parents. Radesky et al. [41] document how child-directed apps can incorporate manipulative features such as parasocial pressure, reward loops, and emotionally loaded prompts. Schäfer et al. [48] show that children and adolescents may accept deceptive designs when they perceive limited alternatives, and they highlight how constrained exit can lead young users to treat manipulation as simply “how apps work”. Valença et al. [53] advance a rights-based requirements argument — “not deceptive patterns by design” — positioning children’s autonomy, protection from exploitation, and meaningful choice as requirements that should mediate platform design decisions. This aligns with UNCRC General Comment No. 25 [51], which emphasizes children’s rights in the digital environment, including protection and support for evolving capacities. Together, these works elicit a child-centered account of exit friction: if children lack practical and emotional pathways to disengage, retention tactics risk undermining autonomy and informed participation even when the activity is nominally educational.

2.2 Disengagement and stopping as family boundary work

A second body of work shows that disengagement from children’s technologies is rarely an individual decision or a single “close app” action; it is often a negotiated family practice shaped by routines, relationships, and device affordances. Hiniker et al.’s [20] analysis of “screen time tantrums” illustrates how transitions away from screens can be emotionally charged and inadequately supported by available tools, turning disengagement into conflict management work for parents. LeMay et al. [28] similarly foreground children’s lived experiences around screen time, emphasizing that the end of an activity is not merely a timer event but a moment with affective and relational consequences. This line of research reframes stopping as a designable interaction: systems can either scaffold smooth endings or amplify friction and disagreement.

Recent IDC work has extended this perspective by designing explicitly for disengagement and by measuring the emotional complexity of stopping. Wolf et al.’s *Schlusslicht* [57] demonstrates how an ambient display can help children and parents coordinate playing time and disengagement, treating stopping as a shared awareness and coordination challenge rather than a unilateral parental command. Read et al. [42] capture children’s in-the-moment emotions around screen time (e.g., through child-friendly reporting metaphors) and argue that affect should be treated as a first-class signal in wellbeing design. Baxter et al. [2] examine the effects and challenges of transitioning from technology use to non-technology activities in young children, highlighting that these transitions are not merely temporal breaks but context-switching events that often require support and planning. Complementing these empirical and design efforts, Landesman et al. [27] analyze how designers of children’s technology think about child wellbeing, identifying tensions between commercial incentives and values such as curiosity, questioning, and learning through mistakes. Charisi et al. [8] further articulate an agenda for children’s digital wellbeing that foregrounds autonomy and user agency alongside protection, emphasizing that wellbeing is not only about limiting harm but also about enabling children’s meaningful participation and control.

This literature provides two important foundations for our work. First, it positions disengagement as a core interaction to design for — especially in family contexts where stopping is inherently relational. Second, it suggests that systems can unintentionally, or intentionally, *create* additional boundary work. When an app’s mechanics sustain obligations (e.g., streaks, maintenance tasks, penalties for absence) and its settings make leaving difficult, families must spend additional time and efforts navigating interfaces, negotiating emotions, and repairing conflicts. Our study builds on the wellbeing-and-stopping literature by conceptualizing exit friction not only as an end-of-session experience, but as an enduring structure that shapes how children and parents interpret commitment, quitting, and control.

2.3 Gamification, social persuasion, and learning motivation in child-facing systems

A third body of work concerns gamification and socially persuasive design — mechanisms often justified as increasing motivation in learning contexts. Gamification is commonly defined as the use of game design elements in non-game contexts [12]. Reviews highlight that gamification can increase engagement, but effects are heterogeneous and strongly dependent on context, implementation, and what “engagement” means operationally [19, 49]. Within IDC, Brewer et al. [5] demonstrate that gamified elements can motivate children to complete lab study tasks, underscoring the practical power of points, progress indicators, and reward structures. However, translating short-term compliance into long-term learning value is not straightforward, and motivational theories caution against equating persistence with meaningful outcomes.

261 Self-Determination Theory and related motivational research argue that autonomy, competence, and relatedness
262 shape the quality of motivation; externally controlling rewards can undermine intrinsic motivation when they shift the
263 meaning of the activity from self-endorsed learning to compliance and maintenance [11, 46]. This concern becomes
264 sharper in child learning apps where retention mechanics are continuous and visible (e.g., streaks, leagues, daily quests):
265 the child may keep “doing something” while attention drifts away from mastery, reflection, or personally meaningful
266 goals. Moreover, children’s developmental relationship to play and rules complicates the stakes. Foundational accounts
267 of play describe it as a central mode through which children interpret rules, roles, and moral meaning [22, 39, 54].
268 When learning systems overlay additional scorekeeping and loss conditions, performance can feel more serious than
269 intended: losing may be perceived as a moral failure (“I broke my streak”) rather than neutral system feedback.
270

271
272 Social and anthropomorphic cues can amplify these dynamics. The Media Equation and related work show that people
273 respond socially to media and computers, applying interpersonal norms even when they know they are interacting with
274 a system [35, 43]. In child-facing contexts, this tendency is heightened by designs that intentionally present systems
275 as social partners (e.g., coach, friend, teacher) and by children’s developing persuasion knowledge, which can make
276 persuasive intent harder to detect and resist [44]. Williams et al. [56] show that children can be influenced by a talking
277 doll in ways that alter judgments, illustrating how child-agent interaction can carry real persuasive weight. Alberts et
278 al. [1] argue that interfaces that act socially can become *bad social actors* when they exploit social heuristics through
279 tactics such as guilt-tripping, pushiness, or passive-aggression. These perspectives suggest that emotionally loaded
280 prompts and character-mediated nudges are not merely “cute”— they can function as persuasive mechanisms that
281 enforce children’s sense of obligation and reluctance to leave.
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287 *Gap and positioning.* Across this research, a gap remains in understanding how exit friction and socially persuasive
288 cues interact *in child-facing learning ecosystems* to sustain long-term engagement after learning goals shift or wane.
289 Dark patterns research powerfully names obstruction and retention tactics, but much empirical work focuses on
290 adult consumer flows rather than parent-child dynamics around stopping. Children’s digital wellbeing research richly
291 characterizes disengagement as boundary work, yet it has less often treated platform-level retention mechanics as
292 a structural mechanism that produces disengagement difficulty. Gamification scholarship demonstrates that game
293 elements can sustain participation, but few studies investigate the scenario where sustained participation becomes
294 *performative* — engagement that persists while purpose erodes. Our study responds to this gap by empirically examining
295 “no easy way out” as a lived, family-level conundrum in child learning app use, and by connecting it to child autonomy,
296 goal drift, and design responsibility to enable purposeful disengagement.
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301

302 **3 Method**

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304 We conducted an in-depth qualitative study of families’ everyday experiences with a gamified learning app – Duolingo,
305 with a particular emphasis on disengagement, goal drift, and the family work required to pause or exit. Because “no easy
306 way out” is simultaneously practical (e.g., settings, channels, account flows) and emotional (e.g., children’s attachment,
307 anxiety, moralized streak loss), we designed our study to capture both: (1) rich narrative accounts of how engagement
308 changed over time, and (2) concrete interaction traces (e.g., reminders, emails, and settings walkthroughs) that families
309 interpreted as exit friction.
310
311

3.1 Study Design Rationale

Our research questions concern how children (aged 6–12) and parents interpret gamified engagement and how those interpretations shape learning purpose and disengagement. A dyadic interview design is well suited for this context for three reasons.

First, disengagement in childhood is rarely an individual decision; it is negotiated through family routines, parenting strategies, device rules, and school demands. Dyads allow us to observe how meaning is constructed in interaction (e.g., when a parent frames a reminder as “*marketing*,” but a child frames it as “*the owl is sad*”).

Second, children’s experiences of gamified pressure are often situational and hard to elicit through surveys alone. Semi-structured interviews make it possible to follow children’s concrete stories (i.e., bedtime panic, streak repair efforts) and to probe how they understood loss, failure, or disappointment in app language.

Third, our study examines multiple aspects of families’ user experience with app disengagement, including what they *felt*, what they *saw*, and *did*. Thus, we also included artifact elicitation as part of the interviews (e.g., show the email that came after uninstall, walk me through where you turned off reminders) to ground claims in observable interface encounters rather than recall alone.

3.2 Participants

We interviewed 50 parent–child dyads from Canada and the United States. Families varied in initial learning goals (e.g., school support, enrichment, heritage language exploration), subscription experience (e.g., free vs paid), and usage trajectories (e.g., active, paused, or discontinued). Table 1 summarizes participant demographics and app-use profiles. Families received an e-gift card of 20 USD as appreciation for their time.

3.3 Recruitment

We recruited through multiple channels to reduce platform bias and avoid over-representing a single community: (1) postings to parent community groups (e.g., local family Facebook groups and online parenting forums); (2) flyers shared through school and community mailing lists where permitted; (3) word-of-mouth and snowball sampling, where participants could share the study link with other families.

To avoid presupposing harm or priming families toward a “dark patterns” interpretation, our recruitment and interview materials described the study neutrally as examining children’s experiences with gamified learning apps and how families decide to continue, pause, or stop using. We did not use evaluative language (e.g., evil, manipulative, dark patterns) in recruitment. During interviews, we asked for concrete episodes (e.g., Tell me about a time you tried to stop) and invited participants to interpret messages in their own words.

Inclusion and exclusion criteria. We used purposive sampling to recruit parent–child dyads with recent, first-hand experience of Duolingo. To be eligible, families had to meet three inclusion criteria: (1) the child was aged 6–12 at the time of the interview; (2) the child had used Duolingo at least weekly for a sustained period (minimum four weeks) within the past 12 months, so that families could speak to retention mechanics such as streaks and reminders; and (3) the parent reported being involved in the child’s use in some way (e.g., setting up the account, managing device access, monitoring routines, or responding to requests to renew or stop), enabling a dyadic perspective on stopping and boundary work. We intentionally included both current and former users, and families with free-only as well as paid subscription experiences, to capture a range of disengagement trajectories, specifically active, reduced, paused, or discontinued.

Table 1. Participant demographics and app-use profile (parent–child dyads).

Characteristic	Count
Dyads interviewed (N)	50
Children’s age (years)	
6–8	18
9–10	17
11–12	15
Region	
Canada	28
United States	22
Initial goal for adopting the app	
School-driven second language support	20
Enrichment / curiosity (non-school)	16
Heritage / family language exploration	10
Other (e.g., travel, peer influence)	4
Subscription experience	
Never subscribed (free only)	27
Previously subscribed (expired/cancelled)	13
Currently subscribed	10
Current status at interview	
Active (used within past 7 days)	21
Paused/reduced (used within past month, not daily)	12
Discontinued (no use > 1 month)	17
Typical duration of use (cumulative)	
< 1 month	8
1–6 months	24
> 6 months	18
Primary device for child use	
Tablet (iPad/Android tablet)	32
Smartphone (child-owned or shared)	18
Home language context (parent-reported)	
English-dominant	31
Bilingual (English + another)	14
Non-English-dominant	5

We excluded scenarios that would make our core phenomena difficult to observe or ethically complex to interpret. Specifically, we excluded: (a) children outside the 6–12 age range; (b) families where the child’s exposure was minimal (e.g., one-time trial or use for fewer than four weeks), because exit friction and goal drift typically emerge over time; (c) cases where the child used the app exclusively in a school-controlled setting and the family could not reasonably access settings or exit pathways (e.g., managed devices with institutional restrictions), because our focus is on family-governed disengagement; and (d) families who were unable to participate in the interview in English at a level sufficient to support child-centered, open-ended discussion, given the study’s online, conversational format. These criteria were designed to foreground lived experiences of sustained gamified engagement and the family processes involved in pausing and leaving.

3.4 Ethics and Child-Centered Safeguards

The study received our institutional ethics approval. Parents provided informed consent for themselves and parental permission for the child; children provided age-appropriate assent.

Because discussing pressure and difficulty stopping could surface conflict in some families, we implemented safeguards: (1) families could skip any question without explanation; (2) we avoided real-time “forced exit” tasks (e.g., we did not require deleting the account or killing a streak during the session); (3) we structured the interview to reduce blame language. For example, we did not ask *why didn't you stop?* but *what happened when you tried?*; (4) we offered a brief break or switch to parent-only reflection if the child showed discomfort; and (5) we anonymized all examples and removed identifying details in transcripts and write-up.

3.5 Data Collection Procedure

All interviews were conducted online via video call (e.g., Zoom/Teams) and lasted 45–75 minutes depending on the child’s comfort and the complexity of the family’s history.

We used a flexible dyadic format designed to preserve the child’s voice while also capturing parent governance perspectives. Each session followed three phases:

Phase 1: Family story of adoption and early routine (10–15 min). We began jointly, asking families to reconstruct how Duolingo entered the household, what the initial goal was, and how the routine formed. This phase produced a baseline narrative of purpose and early engagement.

Phase 2: Child-centered experience and interpretation (15–30 min). We then invited the child to describe their experiences directly. To reduce abstract talk, we used child-friendly prompts (e.g., What does the owl feel like when you don’t do a lesson? What happens if you miss a day? If Duolingo was a character in a story, what kind of character is it?). When appropriate, we asked the child to show parts of the interface they found motivating or stressful (e.g., streak screen, league, reminders), without collecting screenshots unless families volunteered them.

Phase 3: Disengagement, exit attempts, and boundary work (15–30 min). We returned to a joint format to discuss whether the family had tried to pause, reduce frequency, uninstall, unsubscribe from emails, cancel subscriptions, or delete accounts. We encouraged families to describe specific episodes (e.g., Tell me about a time you tried to stop) rather than general attitudes. This phase emphasized the *exit surface*—the distributed places where families attempted to disengage.

3.6 Artifact Elicitation and Walkthroughs

To ground claims in concrete encounters rather than solely recollection, we incorporated brief artifact elicitation. Families were invited, but not required, to: (1) locate and read a reminder email or notification they remembered as persuasive (e.g., the “it misses you” message); (2) walk through where they attempted to change settings, such as push notifications, email preferences, app settings; (3) describe what happened after uninstall, particularly what messages persisted, how long, and how the child interpreted them; and (4) describe any monetization or renewal prompts they encountered during child use.

We treated artifacts as prompts for meaning-making: we asked not only *what does it say?* but *how did you feel when you saw it?* and *what did you do next?* This allowed us to connect design features to behavioral consequences and learning-purpose shifts.

3.7 Interview Guide

Our semi-structured guide covered:

Adoption and goals: Why Duolingo? Who suggested it? What was the initial learning goal (e.g., school, enrichment, heritage, language, travel)? What was success supposed to look like?

Routine and motivation: When and where did practice happen (e.g., bedtime, commute, after school)? What features felt motivating (e.g., streaks, leagues, rewards, mascot messages)? How did the child talk about the app at home?

Learning meaning and progress: Did the child feel they were learning? Did the parent observe learning transfer (e.g., school use, conversations, confidence)? When did things feel more like “doing Duolingo” than “learning a language”?

Goal drift: Did the child change languages? Repeat easier lessons? Switch to other content (e.g., Music, Chess) to maintain streaks? What prompted those shifts?

Disengagement attempts: Did the family try to pause, reduce frequency, or stop? What triggered that decision (e.g., stress, time, conflict, loss of interest)? What made stopping easier or harder?

Exit surface mapping: What did they try (e.g., turn off notifications, uninstall, unsubscribe emails, cancel subscription)? What happened after each attempt?

Monetization and authority: Did the child encounter prompts to upgrade/renew? Did the child ever request purchase because of fear of losing streak/benefits?

Reflections and ideal design: What would an “easy way out” look like? What would a healthier gamified learning design for children look like?

3.8 Data and Materials

We audio-recorded sessions with permission and transcribed them. We maintained three kinds of data: (1) transcripts of parent and child talk; (2) session memos written immediately after interviews, capturing salient moments, affect, and emerging mechanisms; and (3) artifact notes describing messages and settings paths families referenced. Where families shared screenshots, we stored them securely and treated them as supporting context rather than primary evidence.

3.9 Analytic Approach

We used reflexive thematic analysis [4] to interpret how families made sense of engagement, learning purpose, and exit attempts. Analysis proceeded in five stages:

Stage 1: Familiarization and case summaries. Two researchers read transcripts and created case summaries for each dyad, documenting (a) initial goal, (b) engagement trajectory, (c) evidence of goal drift, (d) exit attempts and outcomes, and (e) child interpretation of mascot messaging.

Stage 2: Initial coding. We performed open coding with an emphasis on participants’ language and participant-generated codes (e.g., “evil bird,” “it misses you,” “streak panic,” “not quitting, not learning,” “whack-a-mole settings”). We coded separately for child voice and parent voice to preserve differences.

Stage 3: Focused coding around mechanisms. We clustered codes into mechanism families that link design to learning harms. These included: loss framing and streak continuity pressure; anthropomorphic guilt and relational obligation; distributed exit surfaces; and monetization prompts that recruit children’s anxiety.

Stage 4: Theme refinement and negative cases. We refined themes by explicitly seeking negative cases and contrasts: dyads who discontinued easily, children who treated the owl as “marketing,” and families who reported that

521 streaks helped them maintain meaningful learning. These cases helped us specify when and for whom exit pressure
522 becomes harmful.

523 **Stage 5: Writing as analysis.** We iteratively wrote theme narratives that connect (a) design feature, (b) child
524 interpretation, (c) family response, and (d) learning meaning shift. We prioritized themes that were both common across
525 dyads and theoretically informative for child-centered learning design. We took several steps to support analytic rigor,
526 including:
527

528 *Triangulation across voices and artifacts.* We compared child and parent accounts within each dyad and used artifact
529 elicitation to ground interpretations (e.g., what an email said, what a settings path looked like).

530 *Negative case analysis.* We systematically documented exceptions to avoid over-generalization (e.g., easy exits, neutral
531 interpretations, beneficial streak use).

532 *Reflexive memos.* We wrote analytic memos throughout, explicitly noting where our prior knowledge of dark patterns
533 could bias interpretation, and we used peer debriefing to challenge premature conclusions.

534 *Separation of claims.* In reporting, we distinguish between what families *experienced* (e.g., anxiety, conflict, drift)
535 and what we can *infer* as mechanisms (e.g., exit surfaces stabilizing retention). We avoid causal claims about learning
536 outcomes beyond what families reported.
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540 4 Findings

541 Families' narratives describe a paradox: Duolingo's gamification can reliably sustain daily engagement, but that same
542 engagement can become progressively less meaningful and harder to stop. Across dyads, we observed a common
543 pattern that early learning excitement yields way to goal drift, while exit friction and social-emotional cues converted
544 disengagement into anxiety and family conflicts. In our interviews, exit challenges were raised by 41 out of 50 dyads
545 (82%). These families described at least one episode where attempting to pause, reduce, or stop use (e.g., uninstalling,
546 turning off reminders, or canceling) was undermined by persistent prompts, fragmented controls, or loss-framed cues.
547 We present five themes, each organized into sub-themes that highlight mechanisms and learning harms.
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552 4.1 Goal Drift: Engagement persists while learning value erodes

553 Most family dyads began with a clear educational goal — supporting school language requirements, learning a popular
554 second language for enrichment, or exploring a heritage language. Early use was described as purposeful and skill-
555 oriented. Over time, many dyads described a gradual shift: the app remained embedded in daily routine, but the reason
556 for use had changed.
557
558

559 *4.1.1 From meaningful learning to metric maintenance.* Parents often described a tipping point where the child's primary
560 objective became "*keeping the streak*" rather than learning a language. Children described the streak as the central
561 reason to do a lesson, especially on busy days.
562

563 "I don't want to lose my streak. So I just do something quick." (C5, 8y/o, boy)

564 This mentality indicates a motivational reorientation: the child's engagement remains stable but performative, while
565 the underlying goal shifts from competence-building to loss avoidance and continuity preservation. As one parent
566 summarized: "*not quitting, not learning, just maintaining.*"
567
568

569 *4.1.2 Avoiding challenges by switching to easier pathways.* When lessons became harder or required sustained attention,
570 many children adapted by selecting easier options that satisfied streak requirements with minimal effort. Families
571
572

described switching to easier languages (often those that felt novel, visually rewarding, or low-stakes early on), repeating familiar lessons, or choosing the shortest exercises. In households that initially adopted Duolingo for academic language learning, these strategies were perceived as undermining the child’s intended learning goals.

“He started with French for school. When it got difficult, he switched to English because it was faster to keep the streak.” (P23, 36y/o, male)

The learning harm imposed by the language-learning service is not simply that children stop progressing; it is that the system trains them into a strategy of minimum viable completion, normalizing the idea that educational practice is something to optimize around rather than engaging with.

4.1.3 Substituting the learning goal with new engagement surfaces. Families also described goal drift as content substitution. As novelty faded, children moved from language learning to other app offerings (e.g., Music, Chess) or to any activity that counts toward streak continuity. Several parents described a sequence: initial target language → easier language → heritage language exploration → Music → Chess. Importantly, parents were not necessarily opposed to exploring. In fact, many welcomed curiosity about new languages or music. However, what concerned them was that transitions were motivated by streak pressure: children searched for the lowest-friction way to avoid loss, rather than reflective choice about learning goals.

“It started as language learning. Then it became ‘whatever keeps the streak alive.’” (P29, 41y/o, female)

This theme grounds our argument that retention metrics can be misleading in child learning contexts: still active may indicate persistent obligation rather than sustained educational value.

4.2 Gamified obligation: When play becomes moral pressure

Children did not only describe Duolingo as a game. They considered it as a system that *expects* them. Many accounts framed daily streak as a duty, and a missed day as a breach that must be repaired.

4.2.1 Streaks as a moral ledger. Children frequently used language of “ruining,” “breaking,” or “losing everything” when discussing missed days. Parents observed “*streak panic*” near bedtime and described nightly routines shaped less by curiosity than by anxiety about loss.

“If I miss, it’s like I failed. I can’t let it end.” (C30, 11y/o, girl)

This is a learning harm because it changes the affective meaning of practice: repeated low-stakes learning becomes high-stakes compliance. Several parents linked this to perfectionism and stress, particularly for children who already struggle with anxiety.

4.2.2 The repair loop to pay or earn your way back. Families described streak repair mechanics (e.g., streak freezes, recovery prompts) as reinforcing obligation. Instead of supporting healthy breaks, the system framed breaks as damage that must be fixed, sometimes via in-app currency, premium features, or extra efforts. Children interpreted this as “*punishment*” or as a “*debt to repay*”. Analytically, this converts pausing into a remediation task and keeps children within a loop of obligation even when motivation declines.

4.2.3 The streak routine that supersedes learning. A striking pattern was that the routine persisted even after learning goals disappeared. Parents described children continuing daily use while openly acknowledging they no longer cared about the original goal. The resulting harm is time displacement: children spend time sustaining an app-defined metric instead of pursuing intrinsically meaningful learning, engaging in other social activities, or rest.

4.3 Character-mediated retention: The “evil bird” as a bad social actor

Families repeatedly described the Duolingo owl as a social actor. The mascot’s tone and presence were not peripheral; they were integral to the exit friction experienced by children.

4.3.1 *Anthropomorphic guilt as re-engagement pressure.* Children often interpreted reminders (e.g., “it misses you” emails) as relational messages. They described feeling that the owl was disappointed, sad, or angry, and that their job was to make it happy by completing a lesson.

“When it says it misses me, I feel bad. Like I should go back.” (C45, 9y/o, boy)

This resonates with an IDC-relevant concern: children’s social interpretations can make them particularly susceptible to certain dark pattern tactics, such as nagging and guilt-based prompts. What may read as brand voice to adults can be experienced by children as a social obligation.

4.3.2 *“The evil bird” as a participant-generated label for coercive tone shifts.* Parents used “evil bird” to describe moments where encouragement turned into children’s social pressure. Even when used jokingly, the label captured an emotional truth: the mascot became a figure that demands daily action. Some parents pointed out a scenario in which the app manipulates children to continue using it, while parents become the antagonists for setting boundaries, often leading to unexpected family conflicts or unpleasant conversations.

“It’s not me pressuring him—it’s the owl. And when I try to stop it, I’m the bad guy.” (P5, 39y/o, female)

Additionally, this situation creates learning harm because it externalizes motivation into a controlling relationship, undermining children’s autonomy and parents’ ability to support self-regulated learning habits.

4.3.3 *The social stickiness of cross-channel reminders.* Families described how socially persuasive cues can persist beyond the app itself. After periods of inactivity, emails and notifications were often interpreted by children as evidence that the owl “still knows” and “still cares,” increasing the cognitive and emotional cost of leaving. Here, exit-oriented dark patterns and social framing intersect most sharply: persistence is not merely technical follow-up, but a relational claim that keeps children feeling watched, accountable, and obliged to return.

4.4 No easy way out: Exit friction increases learning and wellbeing cost

In addition to quit, parents also revealed their desire to pause, reduce frequency, or decouple the app from bedtime stress. Many described exit as distributed and effortful. Among the 50 family dyads, 23 were troubled by the app’s continued communications after uninstall; 12 expressed frustration with a “whack-a-mole” exit experience, and 37 called for pause mechanisms that allow temporary disengagement without children feeling punished or obligated to repay lost streaks.

4.4.1 *Uninstall is not an exit.* A recurring narrative was that uninstalling did not end the relationship: emails continued, reminders appeared elsewhere, and children still felt pulled back to the app. Parents described a mismatch between their boundary action (deleting the app) and the system’s response (nonstop pursuing).

“We deleted it, but the emails kept coming. My child saw them and said ‘it misses me.’ It pulled us back in.” (P18, 37y/o, female)

This exit friction can undermine learning goals by preventing families from resetting routines when a tool stops serving its educational purpose.

677 4.4.2 A “whack-a-mole” exit setting. Parents described toggling off notifications in one place only to see prompts
678 resurface elsewhere (device settings vs in-app settings vs email subscriptions). This fragmented exit surface made
679 children more likely to remain exposed to re-engagement cues, increasing the parental labour required to reset learning
680 routines toward more meaningful engagements.
681

682
683 4.4.3 Streaks allow no breaks. Families asked for a break feature that allows pausing for vacations, exams, burnout,
684 or shifting interests without feeling like losing something (e.g., ruining or breaking a streak). Instead, they perceived
685 the system as centered on *celebrating uninterrupted use* rather than supporting breaks. When streak mechanics were
686 prominently promoted, healthy stopping became difficult. Children experienced pausing as losing achievements or
687 disappointment in failing to keep achievements, while parents experienced it as conflict management that demands extra
688 time and effort. This loss-framing also resulted in learning harm that redirected attention from learning to performance
689 tracking, as children focused on maintaining streaks rather than engaging with content.
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692 693 **4.5 Capitalizing on gamified obligation** 694

695 A subset of families described monetization moments that targeted children directly, including renewal prompts shown
696 during child sessions, bypassing parents’ consent. One parent described a case where a paid plan was nearing expiration
697 but the app prompted the child to renew for another year, and the child acted out of concern about losing access or
698 streak-related benefits.
699

700
701 “It asked my kid to buy another year. He did it because he was worried—he didn’t want to lose things.” (P33, 40y/o,
702 male)
703

704 Analytically, this represents a guardian bypass mechanism: the system exploited children’s gamified obligation (e.g.,
705 loss aversion tied to streak maintenance) to pressure purchase decisions that typically fall under parental governance.
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708 **4.6 Synthesis: Retention endures while meaningful learning erode** 709

710 Across themes, we see a coherent system dynamic. Gamification can sustain daily engagement, but exit-oriented dark
711 patterns stabilize that engagement even when learning value erodes. Children adapt by optimizing for streak continuity
712 and low-effort wins; parents respond with boundary work and conflict management. In this way, engagement success
713 can become a learning and wellbeing failure. This synthesis motivates our design implications: child learning apps
714 should treat “easy way out” not as churn prevention, but as an educational and ethical requirement that protects
715 autonomy, reduces anxiety, and preserves meaningful learning.
716
717

718 **5 Discussion** 719

720 Our findings challenge a convenient assumption in educational technology and show that sustained engagement
721 is not a reliable proxy for meaningful learning. In participant families, Duolingo’s gamification often succeeded at
722 keeping children active, but this activity was frequently accompanied by goal drift (4.1), gamified obligation (4.2),
723 character-mediated retention (4.3), no easy way out (exit friction) (4.4), and in some cases, monetization mechanism
724 that exploited children’s gamified obligation (4.5). We interpret these patterns through relevant theory and then derive
725 design implications and limitations to inform future work.
726
727

5.1 Engagement without learning value: retention metrics can mask learning harms

Across dyads, the most consequential shift was not whether children used Duolingo, but what that use came to mean. Families described a movement from mastery-oriented practice (e.g., learning a school language, progressing through increasingly difficult lessons) to metric maintenance (e.g., “keep the streak alive,” “do something quick,” “don’t break it”). These goal drifts, increasingly misaligned with children’s learning intent, resonate with classic concerns about extrinsic reward systems in learning.

Self-Determination Theory (SDT) distinguishes autonomy-supportive motivation from controlled motivation. When incentives feel controlling, they can undermine intrinsic motivation and encourage compliance instead of meaningful engagement [11, 46]. In our findings, streak continuity and loss-framing often restructured children’s motivation for app use from *I want to learn* to *I must not lose (my streak)*. Importantly, this was not reported as an occasional side effect but as a pattern that persisted even after the educational goal was replaced.

Educationally, challenge and error matter because they support productive learning [24, 25, 32]. However, our findings reveal that children avoid difficult lessons by switching to easier languages, repeating familiar content, or migrating to alternative engagement surfaces. These behaviours preserve continuity but can reduce the challenging learning conditions.

“Not quitting, not learning—just maintaining” captures the learning harm: a platform may report successful retention, even as children exhibit reduced challenge-seeking, displaced time and attention, and diminished meaningful learning. However, we do not claim that Duolingo determines learning outcomes. Rather, we claim that families repeatedly observed a pattern in which the most accessible route to success was not language mastery, but sustained use - an outcome that primarily serves the platform’s engagement metrics rather than children’s learning.

5.2 Gamified learning to gamified obligation: why streaks become social pressure for children

A second interpretive thread concerns why playful mechanics became emotionally taxing. Children described streaks as something that could be ruined or broken, and parents described bedtime “streak panic”. This is not merely annoyance; it is a reconfiguration of the emotional stakes of sustaining streaks.

Developmental perspectives on play help explain this. Children often treat rules and structured systems as socially meaningful; rule-following can carry identity and moral weight beyond instrumental value [39, 55]. When an educational app overlays a persistent, loss-framed rule (e.g., lose the streak if you miss a day), children may interpret daily compliance as a serious duty rather than a lightweight motivational cue. This helps explain why pausing did not feel neutral, nor natural. Families described repair loops (e.g., freezes, recovery prompts) as debt-like mechanics: breaks were framed as “damage” that needed to be repaired, reinforcing a sense of gamified obligation even after interest waned. In SDT terms, these features can shift motivation toward controlled regulation, increasing anxiety and undermining autonomy [46].

5.3 The “evil bird” and socially acting interfaces: relational design as leverage

Parents’ “evil bird” framing indicates that the mascot functioned as a persuasive design that made exit emotionally draining. The Media Equation [43] suggests that people apply social rules to media and computers. Children’s learning apps often leverage this phenomenon by incorporating in-app characters that foster children’s parasocial and emotional attachment through intentional design of a character’s tone, persona, and anthropomorphic presentation [18]. Our findings suggest this design approach can introduce harms in child context: An app retention message sent “from”

781 the Duo character (e.g., “it misses you”) might easily be interpreted by adults as commercial, but by children as a
 782 non-commercial parasocial interaction that generates guilt-driven responsibility.

783 This result aligns with growing concerns that socially acting interfaces can become *bad social actors* when they
 784 strategically leverage social heuristics to steer users toward system-beneficial outcomes [1, 38]. Our findings indicate
 785 that Duo’s social-emotional cues were not incidental; they interacted directly with learning harms by making goal drift
 786 more resilient. Children described pausing or leaving as guilt-inducing and socially disloyal, intensifying retention
 787 pressure at the expense of learning.
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790 5.4 Exit dark patterns as learning infrastructure: why “no easy way out” matters

791 As mentioned in section 2.1, dark patterns research often foregrounds consumer harm, cancellation traps, or unwanted
 792 purchases. Our contribution is to show that exit friction can also constitute a form of learning harm. Families described
 793 exit as distributed across multiple exit surfaces, including in-app settings, device controls, subscription pathways,
 794 uninstall processes, and email channels. This fragmentation created a “*whack-a-mole*” exit struggle, increasing the
 795 likelihood that children would repeatedly encounter re-engagement cues.
 796
 797

798 Prior IDC work shows that ending screen time is an emotionally and socially demanding family practice [20, 28, 57].
 799 Our findings suggest that exit-oriented design can further intensify these demands. Parents expected uninstall to
 800 function as a decisive intervention. However, when emails persisted and used relational language, uninstall no longer
 801 provided a clean break from the app. For children who interpreted these cues socially, ongoing contact reactivated
 802 the motivational loop and undermined families’ efforts to collectively reorient learning habits and routines. Taken
 803 together, this points to the need for a child-centered “easy way out” infrastructure in educational apps, one that supports
 804 autonomy, reduces anxiety, and preserves family governance.
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808 5.5 Monetization on anxiety: Loss-framed prompts as higher-stakes manipulation

809 The renewal story highlights a higher-stakes risk: monetization prompts that capitalize on children’s gamified obligation.
 810 Rather than presenting a neutral choice, these prompts position the child as responsible for preventing loss (e.g., “*keep*
 811 *access*,” “*protect progress*”), thereby pressuring children into hasty, stress-driven decisions that can bypass parental
 812 oversight. This aligns with broader concerns about manipulative design in children’s apps [41] and IDC findings
 813 showing that youth may tolerate deceptive patterns when they lack user agency or viable alternatives [14, 48]. Even if
 814 such prompts are designed for the registered account holder (e.g., a parent) rather than the de facto user (e.g., the child),
 815 our data highlight the potential wellbeing harm education app can impose on children without structurally separate
 816 monetization from loss-framed continuity mechanisms, particularly for child accounts.
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821 5.6 Design implications: designing an easy way out as a learning feature

822 Our findings emphasize that *supporting learning requires supporting users’ autonomy to stay and leave*. In child learning
 823 contexts, “easy way out” should be treated as educationally and developmentally necessary — not as a user attrition. We
 824 outline implications that map directly to mechanisms observed in section 4.1-4.5. Together, these implications can be
 825 summarized as a *child-centered “right to disconnect”* in educational app contexts: children should be able to pause and
 826 leave without being chased, shamed, or commercially pressured, consistent with rights-based perspectives on children
 827 in digital environments [51, 53] (see Table 2 for the summary of findings, related-harms, and design implications).
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 829

830 **D1. Support family to maintain meaningful learning.** Prior IDC work shows transitions away from screens
 831 benefit from scaffolding [20, 57]. To prevent goal drifting, learning apps can implement end-of-session rituals (e.g.,
 832

Table 2. Summary of findings, related harms, and design implications.

Findings	Related Harms	Design Implications
Goal Drift (4.1)	Learning harm: Engagement persists without learning goals and value; Avoiding challenges by switching to easier pathways	Support family to maintain meaningful learning (D1): <ul style="list-style-type: none"> • End-of-session rituals • Parent-child planning tools • Time-of-day strategies that reduce bedtime urgency
Gamified obligation (4.2)	Learning harm: Mastery-oriented learning motivation replaced by repeated, low-stake engagement. Time displacement: Spending time sustaining app-defined metrics instead of pursuing more meaningful activities Wellbeing harm: Loss-framing maintenance reinforces perfectionism, increasing anxiety & stress while undermining autonomy; Feeling punished or the need to repay the debt by streak-repair mechanisms	Replace loss-framed continuity metrics with mastery-centered progress (D2): <ul style="list-style-type: none"> • Flexible practice windows that promote learning quality • Mastery badges held through gaps • Child-selectable learning goals that foreground intent
Character-mediated retention (4.3)	Wellbeing harm: Generating guilt and/or a sense of social disloyalty toward Duo Family conflict: Parents become the “bad guy” for setting boundaries, requiring more time and effort to reconcile	Uphold relational safety with character-mediated interactions and communication (D3): <ul style="list-style-type: none"> • Mascots that celebrate effort and normalize breaks without personifying guilt • Adopt a child-centered relational safety standard: no disappointment scripts; no guilt appeals; no escalating, coercive, or emotionally demanding tone
No easy way out (4.4)	Learning harm: Exit friction redirects attention from reset learning routine back to performance tracking Wellbeing harm: Loss-framed exit dark patterns can create a sense of failure, disappointment, or forfeited achievement Family conflict: Undermining families’ ability to reset routines, increasing parental enforcement demands	Provide a Pause Mode that does not frame breaks as loss (D4): <ul style="list-style-type: none"> • Recognize existing streak achievements • Avoid guilt-toned messaging • Use autonomy-supportive language that normalizes breaks End the “whack-a-mole” by making exit definitive (D5): Default “do not contact” status, with a single transparent control to re-enable contact
Capitalizing on gamified obligation (4.5)	Wellbeing harm: Stress generated through perceived responsibility to avoid loss and to urgently pay for renewal	Decouple monetization from streak loss and child anxiety (D6): Avoid using loss-framing prompts for renewal, upgrade, or purchase-related messages

wrap-up and reflect), parent-child planning tools (e.g., choose your weekly goal together), and time-of-day strategies that reduce bedtime urgency. These features should be framed as learning supports, not as compliance tools.

D2. Replace loss-framed continuity metrics with mastery-centered progress. The harm was not gamified design, but continuity mechanisms that made the easiest path to succeed low-effort engagement (4.1) that erodes meaningful learning and the emotionally coercive gamified obligation (4.2). Alternatives include flexible practice windows that promote learning quality (e.g., three sessions this week), mastery badges that persist through gaps, or child-selectable learning goals that foreground intent. A useful test is: *does the mechanic encourage challenge-seeking when appropriate, or does it reward the shortest route to preserve a metric?*

D3. Uphold relational safety with character-mediated interactions and communication. Children interpret Duo’s relational cues literally and affectively (4.3); therefore, brand characters should not shame, threaten, or exploit children’s parasocial attachment, for example, by implying that leaving harms the character. Instead, mascots can celebrate effort and normalize breaks without personifying guilt. When an app relies on an anthropomorphic agent to create fun, interactive learning, it should adhere to a child-centered relational safety standard. For example, no disappointing language (e.g., you disappointed me), no guilt appeals (e.g., I feel sad that you left), and no escalating coercive or emotionally demanding tone.

D4. Provide a *Pause Mode* that does not frame breaks as loss. Families wanted a way to stop temporarily without streak punishment or debt. A child-centered Pause should: recognize the current streak achievement, suppress guilt-toned messaging, use autonomy-supportive language (e.g., normalizing breaks). Moreover, pause should not be monetized (e.g., buy freezes) in an educational app design to prevent shame from *repaying debt* or *feeling punished*.

D5. End the “whack-a-mole” by making exit definitive. Families expected uninstall to mean exit completely (4.4). For child accounts, uninstall or parent-initiated exit should trigger a *Do Not Contact* state across channels by default, with one transparent control to re-enable contact should the family opt in. This reduces “whack-a-mole” settings and prevents cross-channel re-engagement that children experience as being chased.

D6. Decouple monetization from streak loss and child anxiety. Child accounts should not receive direct renewal or upgrade prompts that rely on loss-framing, as such designs exploit children’s affective vulnerability rather than support informed, developmentally appropriate decision-making (4.5). Moreover, purchase-related messages should also avoid loss-framing manipulations that imply payment is necessary to avert moral failure or the loss of identity-relevant progress.

5.7 Limitations

This study is qualitative and interview-based. It captures families’ interpretations and lived experiences, but does not quantify prevalence or directly measure learning outcomes. Our sample may also reflect self-selection, as families with stronger views of Duolingo (positive or negative) may have been more likely to participate. Children’s accounts were collected in the presence of parents, which may have shaped what they felt comfortable sharing; although we used child-centered prompts, some children may have downplayed conflict-related experiences. The online format further limits observation of in-situ family interactions (e.g., bedtime dynamics) and may have reduced participation among families with limited connectivity.

Our claims are grounded in Duolingo as a focal case. While we argue that the underlying mechanisms may generalize to retention-oriented learning apps, specific features, monetization pathways, and brand personas differ across platforms. Finally, we did not examine individual nuances that may shape children’s responses to the app (e.g., personality, social needs). For instance, some children may develop stronger parasocial attachment to the mascot than others.

5.8 Future work

Our findings motivate several directions for future research. First, diary or experience-sampling studies could capture in-the-moment affect around streak pressure and stopping episodes, complementing retrospective accounts and connecting to IDC work on children’s screen-time emotions [42]. Second, mixed-method audits could systematically map exit surfaces across child learning apps, comparing how platforms distribute exit controls across channels and how defaults operate after uninstall. Third, design research could prototype and evaluate “easy way out” interventions — Pause modes, mastery-centered progress indicators, and contact cessation defaults — measuring not only engagement but alignment outcomes such as challenge-seeking, autonomy, perceived stress, and family conflict. Finally, policy-oriented work could translate child-centered rights principles into actionable requirements for educational apps, extending requirements perspectives on “not deceptive by design” toward the specific case of exit and disengagement [51, 53].

Taken together, our findings suggest that the central question for child learning apps is not whether gamification can sustain engagement—it can—but what that engagement becomes, and at what cost. Across families, exit-oriented dark patterns stabilized use after learning goals had drifted, converting practice into retention-first compliance. Designing an “easy way out” is therefore not a threat to learning; it is a precondition for learning to remain meaningful, voluntary, and developmentally appropriate.

6 Conclusion

Gamified learning apps are often positioned as a solution to a familiar problem: children struggle to persist, so design should make practice engaging and sustainable. Our interviews with parent–child dyads complicate this narrative. In these families, retention-oriented mechanics frequently sustained daily use while educational meaning eroded. Children’s engagement drifted from mastery-oriented learning to metric maintenance; parents described increasing boundary work to manage streak pressure, emotional reactions, and fragmented exit pathways. What appeared to be “successful engagement” at the platform level often felt to families like pressured continuity without learning value.

By centering disengagement as a lived family process, this paper shows that “no easy way out” is a structural mechanism through which gamification can become harmful for children. We introduced *goal drift* and *gamified obligation* to describe how loss-framed progress systems and socially persuasive cues can stabilize engagement even after a child’s initial learning purpose has faded. We further show how anthropomorphic messaging and cross-channel re-engagement can transform leaving into a social struggle, increasing children’s guilt and anxiety and shifting parents into the role of adversary.

Our findings suggest a reframing for child-centered learning technologies: sustaining fun in learning also requires protecting the right to leave. Designing an “easy way out”—through achievement-preserving pause modes, mastery-centered progress that survives intervals, relationally non-coercive mascot communication, default contact cessation for child accounts, and safeguards against loss-framed monetization—should be treated as learning infrastructure rather than a threat to retention. More broadly, we argue that a child-centered right to disconnect is essential for educational technologies that claim to build healthy habits: children and families must be able to pause, disengage, and exit without punishment, nonstop pursuit, or emotional coercion, so that persistence remains meaningful and respectful and continues to serve learning goals as they evolve over time.

7 Selection and Participation of Children

Children were recruited via purposive sampling of parent-child dyads with recent, first-hand experience using Duolingo in daily family routines, enabling a dyadic perspective on pausing and stopping. Parents offered informed consent for themselves and parental permission for the child. Meanwhile, children provided age-appropriate assent and were told that this study explores children's experiences with gamified learning apps and how families decide to continue, pause, or stop using. To prioritize child wellbeing when discussing pressure or disengagement, families could skip any question. Moreover, we avoided any "forced exit" tasks (e.g., deleting accounts or breaking streaks), and we offered breaks or a switch to parent-only reflection if a child showed fatigue or discomfort. Interviews were conducted online; interface walkthroughs and screenshots were optional and only used when families voluntarily shared them. With permission, sessions were audio-recorded and transcribed. All artifacts and screenshot notes were stored securely and used as supporting context. Data sharing was communicated during consent as follows: we report only anonymized excerpts and do not publicly share raw audio or video recordings, transcripts, or identifiable artifacts; any future sharing would be limited to anonymized materials and governed by participant consent and institutional ethics requirements.

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