



SplitHomework — Research Brief

Attention, instant gratification, ADHD, and the earned-reward loop — what the evidence actually supports, what it doesn't, and how the product maps onto it

Drafted May 2026 · companion to the SplitHomework Product Thesis and Build Plan · every numeric claim below is footnoted to a real source listed on page 6; claims we could not verify are flagged, not invented

THE SYNTHESIS (IN ONE PARAGRAPH)

Two things are well-documented: **(a)** how long people sustain attention on a screen before switching has fallen sharply over ~20 years — from roughly 2.5 minutes (2004) to about 75 seconds (2012) to about 47 seconds in recent years, replicated by independent labs^[1]; and **(b)** US tweens and teens now consume an enormous amount of short-form online video — teens average more than 8.5 hours/day of screen entertainment media, watch ~1h22m/day of online video (up 23 min since 2019), and the share saying they're online "almost constantly" is roughly double what it was a decade ago^[2,3,4]. The bridge between those two facts — that heavy short-form-video use is *causing* a rising "appetite for instant gratification" in kids — is **plausible and partly supported but not cleanly proven**: the studies linking heavy short-video use to worse sustained attention, more procrastination, and more ADHD-type symptoms are mostly recent, cross-sectional, and correlational^[5,6,7,8,9], and the classic "kids who can't delay gratification do worse" finding shrank by half-to-two-thirds in a larger, better-controlled replication^[10]. Separately, ADHD — diagnosed in ~11.4% of US children in 2022, about a million more than in 2016^[11] — comes with a robust, well-replicated **preference for small-immediate over large-delayed rewards** ("delay aversion")^[12], and the behavioral approaches with the strongest evidence for these kids are exactly the ones SplitHomework is built from: **contingency management / token economies with immediate, frequent, salient reinforcement**, the **Premack ("first-then") principle**, and structured **homework/organization interventions**^[13,14,15,16]. So: the cultural premise is directionally right but should be stated carefully; the ADHD mechanism is solid; and the product's design is a faithful operationalization of that mechanism — which is a reason to build and pilot it, not a claim that it works yet.

1 THE ATTENTION-SPAN TREND — WHAT THE DATA ACTUALLY SHOWS

The solid finding. Gloria Mark (UC Irvine) and colleagues have measured how long people focus on a single screen before switching, in workplace observation studies spanning ~2004 to recent years: the average fell from **about 2.5 minutes (2004) to about 75 seconds (2012) to about 47 seconds** in the last several years, with a median around 40 seconds; other researchers replicated values of roughly 44–50 seconds^[1]. That work is about adults at computers, not kids per se — but it establishes that sustained on-screen attention has measurably contracted in the smartphone/feed era.

The exposure side, for kids specifically. US tweens (8–12) and teens (13–18) live inside that environment: per Common Sense Media's 2021 census, teens average **more than 8.5 hours/day** of entertainment screen media and tweens more than 5.5 hours; the share watching online video *every day* rose from 2019 to **77% of teens and 64% of tweens**; teens watch about **1 hour 22 minutes/day** of online video (up 23 minutes since 2019) and tweens about 57 minutes; and short-form platforms (YouTube, including Shorts; TikTok) are the rising share while traditional TV declines^[2]. Pew (2023) adds: the vast majority of US teens use YouTube and most visit it daily (16% "almost constantly"); 58% are daily TikTok users (17% "almost constantly"); and **nearly half of teens say they use the internet "almost constantly," roughly double the ~24% who said so in 2014–15**^[3]. The 2024 follow-up shows the same pattern holding^[4].

What we deliberately do *not* use. The viral claim that "the human attention span is now 8 seconds, shorter than a goldfish's" is not credible — it traces to an uncited figure popularized in a 2015 industry report and has been picked apart by fact-checkers and researchers (including the original sources disowning it)^[17]. We don't cite it, and the design doesn't depend on it.

2 "APPETITE FOR INSTANT GRATIFICATION, RISING EVERY YEAR" — WHAT'S SOLID, WHAT'S AN INFERENCE

This is the cultural premise behind SplitHomework, and it deserves an honest treatment, because the phrase "rising every year" implies a measured longitudinal trend that, as far as we can find, **nobody has cleanly measured**. What there is:

- **Rising exposure to instant-reward media** — documented (§1^[2,3,4]). Short-form video is engineered around fast, frequent, low-effort reward; consumption of it by kids is large and growing.
- **Correlational links between heavy short-video use and the things "instant-gratification appetite" would predict**. Recent studies — mostly 2023–2025, mostly cross-sectional, several in Chinese or Thai samples and not all in top-tier journals — report that heavier short-form-video use is associated with *more inattentive symptoms in school-age children*^[5], *lower academic achievement mediated by reduced attention* in elementary students^[6], and *more academic procrastination via impaired attention control* in undergraduates^[7]. The direction is consistent across studies; the designs can't establish that the video *caused* it (heavier users may differ to begin with).
- **A modest longitudinal signal for digital media → ADHD-type symptoms**. Ra et al. (JAMA, 2018) followed ~2,500 LA high-schoolers with no significant ADHD symptoms at baseline for two years: those reporting many high-frequency digital activities had a higher subsequent rate of ADHD symptoms (~9.5–10.5%) than non-users (~4.6%) — a statistically significant but, in the authors' own words, **modest** association^[8]. A 2024 systematic review of longitudinal studies concludes the relationship between digital media use and later ADHD symptoms is real but small and the literature mixed^[9].
- **The "marshmallow" caveat**. Mischel's classic work tied preschool delay-of-gratification to later achievement, but Watts, Duncan & Quan's larger, more diverse, better-controlled conceptual replication (Psychological Science, 2018) found the association was about **half the original size, and shrank by roughly two-thirds once family background and early cognitive ability were controlled** — and the authors concluded that an intervention which merely improved a child's *ability to wait*, without changing broader cognitive/behavioral capacities, "would have very small effects"^[10].

HONEST STATEMENT OF THE PREMISE

What we can defensibly say: **kids today spend far more time inside fast-reward media than kids a decade ago, and heavier use of that media is correlated with — and modestly predictive of — worse sustained attention, more procrastination, and more ADHD-type symptoms**. What we *cannot* say: that there is a clean, directly-measured "instant-gratification appetite" rising on a year-by-year curve, or that the video *causes* these effects in any individual child. SplitHomework is therefore not pitched as "a cure for a measured epidemic of impatience" — it's pitched as a tool that takes the reward *format* kids are already wired toward and makes it contingent on the work, which is a much smaller and more defensible claim.

3 ADHD – PREVALENCE, DELAY AVERSION, REWARD SENSITIVITY, AND WHY HOMEWORK IS THE PAIN POINT

Scale. Per the CDC, an estimated **7 million (11.4%) US children aged 3–17 had ever been diagnosed with ADHD as of 2022 – about 1 million more than in 2016**^[11]. (Commentators attribute much of the rise to greater awareness, pandemic-era mental-health attention, and parents observing their kids during remote learning – i.e., more detection, not necessarily more underlying disorder^[11].) Either way, it is a large population for whom "just focus and do your homework" is not advice that works.

Delay aversion and the immediate-reward preference. One of the most consistent findings in the ADHD motivational literature: children with ADHD show a marked preference for **small, immediate rewards over larger, delayed ones** – on both simple choice-delay tasks and temporal-discounting paradigms, with small-to-medium effect sizes in meta-analysis^[12]. Sonuga-Barke's *delay-aversion* account frames this not (only) as a deficit in executive control but as a motivational one: reward delay (and situations that require waiting) elicits negative affective states, so children avoid such settings – and when they can't, the delay itself drives up inattentive and hyperactive behavior. Neuroimaging work links this delay aversion to hyper-activation in amygdala and prefrontal regions during anticipated waiting^[12]. The practical implication is direct: **these students are unusually badly served by tasks whose payoff is distant and abstract – which is exactly what homework is – and unusually well-served by reinforcement that is immediate, concrete, and frequent.**

Homework specifically. Homework problems are a well-characterized domain of difficulty for students with ADHD – incomplete or unreturned work, poor planning and materials management, time-management breakdowns – and there is a dedicated intervention literature aimed at it (e.g., the Homework, Organization, and Planning Skills program, §4^[16]). Homework is, in other words, precisely the place where the ADHD reward/delay profile collides hardest with what school demands – and precisely the place SplitHomework targets.

The ADHD profile, as it bears on this product

- **Prefers immediate to delayed reward** – robust, replicated^[12].
- **Delay itself is aversive** – waiting elicits negative affect and worsens attention/hyperactivity^[12].
- **Responds to salient, frequent reinforcement** – a consequence that isn't noticed or valued by the child does little^[14].
- **Task initiation & planning are weak** – starting and organizing homework is a core deficit^[16].

What this does *not* license us to claim

- That ADHD is "caused by screens" – the longitudinal evidence is modest and ADHD is highly heritable; screen use is at most one modulating factor^[8,9].
- That a study app *treats* ADHD – the evidence base for treatment is behavior therapy / parent training and (for 6+) medication^[13]; SplitHomework is a scaffold delivered alongside those, not a substitute.
- That every ADHD student will respond – ADHD is heterogeneous; effect sizes for the motivational findings are small-to-medium, not universal^[12].

4 WHAT ACTUALLY WORKS FOR ADHD LEARNING – THE BEHAVIORAL EVIDENCE SPLITHOMEWORK IS BUILT FROM

For the academic and behavioral side of ADHD, the strongest non-pharmacological evidence converges on a small set of behavioral-management techniques. SplitHomework is, deliberately, a packaging of three of them.

(a) Behavior therapy / parent training in behavior management – the recommended foundation

The American Academy of Pediatrics recommends **parent training in behavior management as first-line treatment for children under 6 with ADHD, before medication**, and combining behavior therapy with medication for children 6 and older; CDC summarizes that behavior therapy delivered by parents "has been shown to work as well as medication for ADHD in young children"^[13]. The core moves taught are positive reinforcement of target behaviors, structure and routine, and clear contingencies – the same logic SplitHomework runs on the homework→reward link.

(b) Token economies and the "immediate, frequent, salient" prescription

Classroom-intervention reviews are consistent: **token reinforcement systems work because they deliver consistent, immediate, specific, and salient feedback**^[14]. "Salient" is load-bearing – a consequence has a negligible effect if the child doesn't notice it or doesn't value it, so effective systems use reinforcers the child actually wants, delivered right away, often. Token economies (alone and within broader behavioral programs) have evidence for improving on-task behavior and academic engagement in students with ADHD^[14]. SplitHomework's earned-time bank is a token economy where the token is the thing the kid most wants (the feed), it's delivered the instant a problem is answered, and the rate is small enough to be frequent.

(c) The Premack ("first-then") principle

Premack's principle – a more-probable behavior reinforces a less-probable one – has been a staple of classroom and therapeutic practice for ~60 years; "first-then" sequencing (do the less-preferred task, then get the preferred activity) is widely used to increase task completion and engagement, and a systematic review catalogs its application across dozens of educational and therapeutic studies^[15]. SplitHomework is, structurally, a "first-then" board with a stopwatch: *first* the homework, *then* a metered window of the high-probability behavior – locked until the first part happens.

(d) Structured homework/organization interventions – proof the target is reachable

The Homework, Organization, and Planning Skills (HOPS) program – direct instruction in materials organization, planning, and homework time-management – was tested in a randomized controlled trial of 47 middle-schoolers (grades 6–8) with ADHD versus a waitlist: intervention students showed large gains in parent-rated **homework completion (d = .85)**, planning (d = 1.05), and organized actions (d = .88)^[16]. That doesn't validate SplitHomework – different intervention – but it establishes that the specific outcome SplitHomework cares about (homework actually getting done) is movable by a structured behavioral tool in this population, and gives a benchmark a SplitHomework pilot can be measured against.

5 HOW SPLITHOMEWORK MAPS ONTO THE EVIDENCE – AND WHERE IT DOESN'T

DESIGN ELEMENT	EVIDENCE IT'S GROUNDED IN	THE HONEST LIMIT
Homework gates a short, immediate burst of the feed (Premack / contingency management)	First-line behavioral practice for ADHD; Premack/"first-then" is decades-old and reviewed across many studies; token economies work via immediate, frequent, salient reinforcement ^[13,14,15] .	Those studies are of teacher/parent-administered systems, not a self-serve web app; SplitHomework's loop is faithful in form, but its effectiveness in this delivery mode is untested.
The reward is the thing the kid is already pulled toward (an educational video feed), delivered the instant a problem is answered	Reinforcer must be salient/valued to work ^[14] ; ADHD's robust preference for immediate over delayed reward means an immediate reward, contingent on work, is exactly the lever the motivational literature points at ^[12] .	Using a video feed as the reinforcer is novel and double-edged — see the risks section of the Build Plan; some clinicians/parents will (reasonably) prefer a non-screen reinforcer, which is why an alternate-reward mode is planned.
Bursts are small, metered, capped (10 min), and tick down only while a video plays; partial credit for a wrong answer; worked solution shown	Frequent small reinforcement > one large delayed one; "first-then" needs the "then" to actually end so the "first" can recur; partial credit keeps a stuck student from rage-quitting — consistent with avoidance-motive management ^[12,14,15] .	The exact rates (+1:00 / +0:30 / 10-min cap) are a starting guess, not calibrated against data; personalization and tuning are explicitly Phase-2 work.
Framed as "lowering the activation energy to start and re-engage with homework," not "training attention/multitasking"	Task initiation and planning are core ADHD deficits ^[16] ; reducing the cost of starting is a legitimate target. Media-multitasking, by contrast, is associated with worse attention ^[5,6,7,8] , so the modest framing is the only defensible one.	Whether the loop actually shortens time-to-start / time-to-resume in practice is an empirical question the demo can't answer — it's the first thing a pilot must measure.
Low-stakes, private, no grades, parent-administered rates	Positive-reinforcement, structure, and clear contingencies are the taught core of behavioral parent training ^[13] ; nothing punitive added.	None on evidence grounds; the open question is adoption — whether kids and parents will actually use it as designed (a pilot question).
An in-app lock on the embedded feed	—	The biggest evidence-independent weakness: a soft in-app lock is trivially bypassable (open YouTube in another tab). A real version needs a browser-extension/device-level block; until then the "gate" is a nudge, not a contingency, and any pilot has to account for that.

What a pilot has to test (the falsifiable version, restated from the Thesis)

(1) **Homework throughput rises** versus the student's own baseline; (2) **time-to-start and time-to-resume drop**; (3) **the cap actually pulls them back** — sessions end on "out of time," not "closed the app"; (4) **self-report improves** ("got more done / less of a fight"); and it **fails** if homework output doesn't move, the feed dominates sessions, or accuracy collapses because students guess-spam for time. A reasonable benchmark for "meaningful": the HOPS RCT's homework-completion effect ($d \approx .85$) is the high bar; even a fraction of that, achieved by a self-serve tool, would be notable^[16]. If a well-run pilot disconfirms, the thesis as stated is wrong — and the product should change or stop.

BOTTOM LINE OF THE BRIEF

The cultural premise (kids are marinating in fast-reward media; that's correlated with worse attention and more procrastination) is directionally well-supported but should be stated without the "8-second goldfish" theatrics. The ADHD mechanism (immediate-reward preference, delay aversion, response to salient frequent reinforcement, homework as the pain point) is solid and well-replicated. And the behavioral toolkit that works for ADHD learning — contingency management / token economies / Premack / structured homework support — is exactly what SplitHomework operationalizes. That's a strong reason to build it and run a real pilot. It is not, and the product should never claim it is, evidence that SplitHomework *works* — that's what the pilot, and later a proper efficacy study, are for.

6 SOURCES

All URLs accessed May 2026. Where a claim rests on a specific number, the number is quoted from the source. Secondary/summary pages are noted as such; primary research is linked where available.

- [1] **Attention span on screens.** Mark, G. *Attention Span: A Groundbreaking Way to Restore Balance, Happiness and Productivity* (Hanover Square Press, 2023). Summary with the ~2.5 min (2004) → ~75 s (2012) → ~47 s (recent), median ~40 s, and independent replications (~44–50 s); University of California, "Can't pay attention? You're not alone." universityofcalifornia.edu/news/cant-pay-attention-youre-not-alone · author page: gloriemark.com/attention-span
- [2] **Kids' screen & short-form-video use.** Common Sense Media. *The Common Sense Census: Media Use by Tweens and Teens, 2021* (most recent tweens/teens edition). Report PDF: commonsensemedia.org/.../8-18-census-integrated-report-final-web_0.pdf · press release (YouTube beats TV/games; daily online-video shares; +23 min since 2019): commonsensemedia.org/press-releases/...
- [3] **Teen platform use & "almost constantly" online.** Pew Research Center, *Teens, Social Media and Technology 2023* (Dec 11, 2023; survey of 1,453 US 13–17-year-olds). pewresearch.org/internet/2023/12/11/teens-social-media-and-technology-2023
- [4] **Continuation of the pattern.** Pew Research Center, *Teens, Social Media and Technology 2024* (Dec 12, 2024). pewresearch.org/internet/2024/12/12/teens-social-media-and-technology-2024
- [5] **Short-form video & inattention in children.** "Short-Form Video Media Use Is Associated With Greater Inattentive Symptoms in Thai School-Age Children: Insights From a Cross-Sectional Survey" (data collected Nov 2023–Mar 2024). PMC: [pmc.ncbi.nlm.nih.gov/articles/PMC12230358](https://pubmed.ncbi.nlm.nih.gov/articles/PMC12230358) · PubMed: pubmed.ncbi.nlm.nih.gov/40619997
- [6] **Short video, attention, and elementary-school achievement.** "The relationship between short video usage and academic achievement among elementary school students: the mediating effect of attention and the moderating effect of parental short video usage" (n = 1,052). PMC: [pmc.ncbi.nlm.nih.gov/articles/PMC11588245](https://pubmed.ncbi.nlm.nih.gov/articles/PMC11588245)
- [7] **Short-form video & academic procrastination.** "The effect of short-form video addiction on undergraduates' academic procrastination: a moderated mediation model" (attention control as mediator). PMC: [pmc.ncbi.nlm.nih.gov/articles/PMC10756502](https://pubmed.ncbi.nlm.nih.gov/articles/PMC10756502)
- [8] **Digital media use → subsequent ADHD symptoms (longitudinal).** Ra, C.K., et al. "Association of Digital Media Use With Subsequent Symptoms of Attention-Deficit/Hyperactivity Disorder Among Adolescents." *JAMA* 320(3):255–263 (2018). jamanetwork.com/journals/jama/fullarticle/2687861 · PubMed: pubmed.ncbi.nlm.nih.gov/30027248
- [9] **Systematic review of the longitudinal evidence.** "Longitudinal associations between digital media use and ADHD symptoms in children and adolescents: a systematic literature review." *European Child & Adolescent Psychiatry* (2024). link.springer.com/article/10.1007/s00787-022-02130-3 · PMC: [pmc.ncbi.nlm.nih.gov/articles/PMC11272698](https://pubmed.ncbi.nlm.nih.gov/articles/PMC11272698)
- [10] **The marshmallow-test replication.** Watts, T.W., Duncan, G.J., & Quan, H. "Revisiting the Marshmallow Test: A Conceptual Replication Investigating Links Between Early Delay of Gratification and Later Outcomes." *Psychological Science* 29(7):1159–1177 (2018). journals.sagepub.com/doi/abs/10.1177/0956797618761661 · PMC: [pmc.ncbi.nlm.nih.gov/articles/PMC6050075](https://pubmed.ncbi.nlm.nih.gov/articles/PMC6050075)
- [11] **ADHD prevalence in US children.** CDC, "Data and Statistics on ADHD" — 7 million (11.4%) of US children 3–17 ever diagnosed (2022 National Survey of Children's Health), ~1 million more than in 2016. cdc.gov/adhd/data/index.html · primary report: Danielson, M.L., et al., "ADHD Prevalence Among U.S. Children and Adolescents in 2022...." *J. Clinical Child & Adolescent Psychology* (2024). pubmed.ncbi.nlm.nih.gov/38778436 · commentary on the rise: [pmc.ncbi.nlm.nih.gov/articles/PMC1193851](https://pubmed.ncbi.nlm.nih.gov/articles/PMC1193851)
- [12] **ADHD, delay aversion & immediate-reward preference.** Marx, I., Hacker, T., Yu, X., Cortese, S., & Sonuga-Barke, E. "ADHD and the Choice of Small Immediate Over Larger Delayed Rewards: A Comparative Meta-Analysis..." *J. Attention Disorders* 25(2):171–187 (2021). journals.sagepub.com/doi/abs/10.1177/1087054718772138 · general-population study of delay aversion vs. choice impulsivity: [pmc.ncbi.nlm.nih.gov/articles/PMC2788754](https://pubmed.ncbi.nlm.nih.gov/articles/PMC2788754) · neuroimaging of delay aversion: Van Dessel, J., et al., *J. Child Psychology & Psychiatry* (2018), onlinelibrary.wiley.com/doi/10.1111/jcpp.12868
- [13] **Behavior therapy / parent training — first-line for ADHD.** CDC, "Treatment of ADHD" and "Parent Training in Behavior Management for ADHD" (AAP recommends parent behavior-management training first for under-6, combined with medication for 6+; behavior therapy delivered by parents works as well as medication in young children). cdc.gov/adhd/treatment/index.html · cdc.gov/adhd/treatment/behavior-therapy.html
- [14] **Token economies; immediate/frequent/salient reinforcement in the classroom.** DuPaul, G.J., & Weyandt, L.L. "ADHD in the Classroom: Effective Intervention Strategies." *Theory Into Practice* 50(1):35–42 (2011). tandfonline.com/doi/full/10.1080/00405841.2011.534935 · review: "Psychosocial Interventions to Improve the School Performance of Students with ADHD," PMC: [pmc.ncbi.nlm.nih.gov/articles/PMC2998237](https://pubmed.ncbi.nlm.nih.gov/articles/PMC2998237)
- [15] **The Premack ("first-then") principle.** Premack, D. (1959, 1965) — more-probable behavior reinforces less-probable behavior. Overview & classroom/therapeutic application (incl. a systematic review of ~52 studies): SAGE Encyclopedia of Educational Research, Measurement & Evaluation, "Premack Principle." methods.sagepub.com/.../premack-principle
- [16] **Homework/organization intervention for ADHD (RCT).** Langberg, J.M., et al. "Evaluation of the Homework, Organization, and Planning Skills (HOPS) Intervention for Middle School Students with ADHD as Implemented by School Mental Health Providers." *School Psychology Review* 41(3):342–364 (2012) — RCT, 47 students grades 6–8 vs. waitlist; parent-rated homework completion $d = .85$, planning $d = 1.05$, organized actions $d = .88$. PMC: [pmc.ncbi.nlm.nih.gov/articles/PMC4209597](https://pubmed.ncbi.nlm.nih.gov/articles/PMC4209597) · program site: hopsintervention.com
- [17] **The "8-second / goldfish" attention-span myth (cited here only to disown it).** Maybin, S. "Busting the attention span myth." BBC News (2017) — traces the figure to an uncited Statistic Brain number popularized in a 2015 Microsoft Canada report; sources could not substantiate it. bbc.com/news/health-38896790

· WHAT THIS BRIEF DELIBERATELY DOES NOT ASSERT

- That there is a directly-measured, year-by-year "rising appetite for instant gratification" in children — no clean dataset for that; we infer the direction from declining on-screen attention^[1], rising short-video consumption^[2,3,4], and correlational links to worse attention/procrastination^[5,6,7,8,9].
- That short-form video causes attention or ADHD problems in any individual — the longitudinal signal is modest and the cross-sectional studies can't establish causation^[8,9].
- That improving "ability to delay" is itself high-leverage — the replication evidence says it's largely a marker of family background and cognitive ability, not a malleable cause^[10].
- That SplitHomework treats ADHD or is a substitute for behavior therapy, parent training, medication, or instruction^[13].
- That SplitHomework works — no efficacy data exists yet; the demo proves the loop is legible, not that it changes outcomes. The pilot, and later a proper study, are how that gets answered.