

Treats Pedagogical Foundation: Reward System and Motivation

This document summarizes the scientific and theoretical foundations supporting Treats' adaptive reward system. The Treats model aligns with contemporary research in motivation, cognitive psychology, and neuroscience, demonstrating how intelligently managed rewards can enhance learning, persistence, and engagement without reducing intrinsic motivation.



1. Self-Determination Theory (Deci & Ryan)

Self-Determination Theory (SDT) posits that humans have three basic psychological needs — autonomy, competence, and relatedness — and that motivation flourishes when these needs are met. Rewards can support intrinsic motivation if they reinforce a sense of competence and autonomy rather than control behavior. Treats integrates this by offering adaptive, competence-based rewards while preserving user autonomy in pace and timing.

Key References:

- Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin, 125(6), 627–668.*
- Ryan, R. M., & Deci, E. L. (2020). *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness.* Guilford Press.

2. Reinforcement Learning and Positive Feedback Loops

Positive reinforcement enhances both motivation and memory consolidation by leveraging dopaminergic learning mechanisms. When calibrated correctly, variable rewards sustain engagement without creating dependency. Treats' AI system dynamically adjusts the frequency and intensity of feedback to maintain optimal engagement and cognitive challenge.

Key References:

- Schultz, W. (2015). Neuronal reward and decision signals: From theories to data. *Physiological Reviews, 95(3), 853–951.*
- Dweck, C. (2006). *Mindset: The New Psychology of Success.*
- Mishra, S., et al. (2021). Reinforcement learning and motivation in educational technologies. *Frontiers in Psychology, 12:668409.*



3. Gamified Learning and Engagement in Children

Modern educational research confirms that gamification and adaptive feedback mechanisms can improve motivation, engagement, and knowledge retention among children aged 6–12. The Treats reward structure aligns with evidence that when game-like elements are linked to competence and learning progress, intrinsic motivation is not diminished — it is strengthened.

Key References:

- Hamari, J., Shernoff, D. J., Rowe, E., Coller, B., Asbell-Clarke, J., & Edwards, T. (2020). Challenging games help students learn: An empirical study on engagement, flow, and motivation. *Computers in Human Behavior, 54, 170–179.*
- Su, C.-H., & Cheng, C.-H. (2021). Gamified learning and student engagement: A meta-analysis. *Educational Research Review, 33, 100391.*
- Mekler, E. D., Brühlmann, F., Tuch, A. N., & Opwis, K. (2022). Towards understanding the effects of individual gamification elements on intrinsic motivation and performance. *Computers in Human Behavior, 71, 525–534.*

4. Strategic Implication for Treats and App Review

Treats implements a scientifically grounded adaptive reward system that reinforces learning through competence feedback rather than mere extrinsic incentives. The model adheres to established psychological principles and contemporary educational ethics. This framework provides a strong defense against potential concerns regarding 'addictive' or 'exploitative' reward mechanisms during app store review.

Key Position Statement:

“Treats implements a pedagogically grounded, self-determination-based adaptive reward system. Rewards are not external bribes but feedback signals designed to reinforce competence and flow, in full alignment with contemporary motivational psychology and neuroscience.”

