Kognitionspsychologie II: Session 7

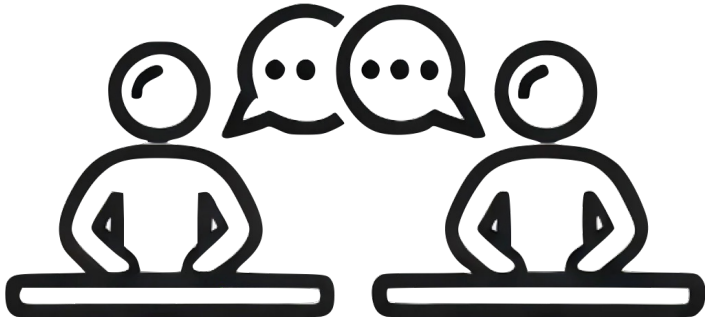
Motivation: Extrinsic vs intrinsic motivation

Rui Mata, FS 2025

Version: April 15, 2025

WHY ARE YOU HERE?

What are your motives for learning about cognitive psychology?

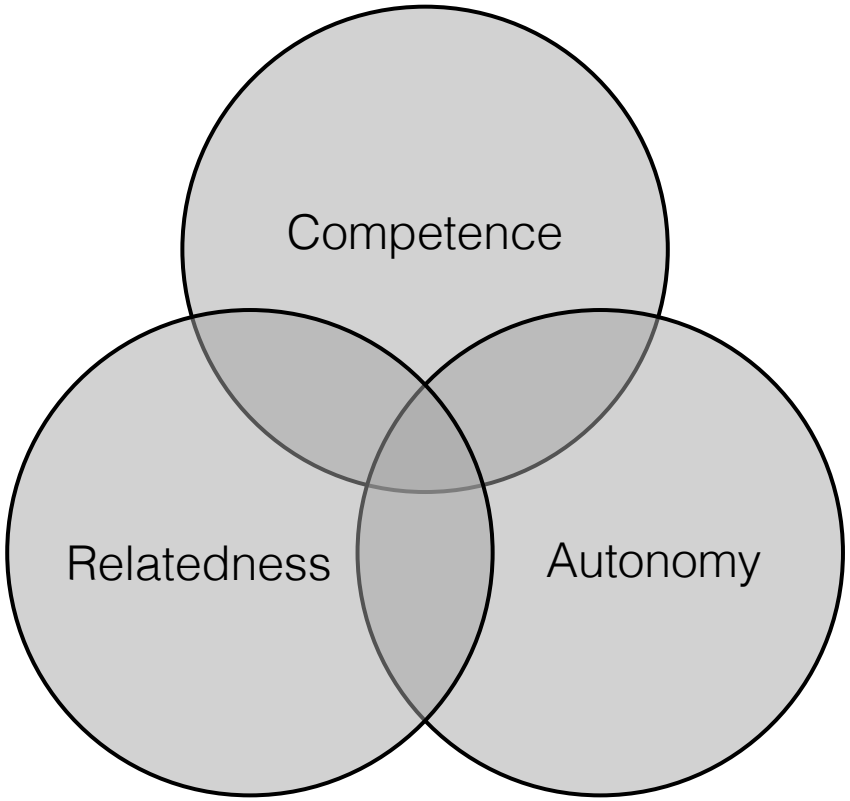


Learning Objectives

- Distinguish between **extrinsic** and **intrinsic** motivation
- Learn about the empirical literature on **incentivization** and its relation to extrinsic and intrinsic motivation
- Learn about alternatives to incentivization (e.g., **motivational interviewing**) and discuss related promises and challenges
- Discuss the importance of the interplay between **theory** and **evidence** (from primary studies to syntheses) in the psychology of behavior change

Self-Determination Theory

"The findings have led to the postulate of three innate psychological needs--competence, autonomy, and relatedness-- which when satisfied yield enhanced self-motivation and mental health and when thwarted lead to diminished motivation and well-being."



Competence

Seek to control the outcome and experience mastery[

Relatedness

Is the universal want to interact, be connected to, and experience caring for others

Autonomy

Is the universal urge to be causal agents of one's own life and act in harmony with one's self

Ryan, R. M. & Deci, E.L. (2000). Self determination theory and the facilitation of intrinsic motivation, social development, and well-being. ***American Psychologist, 55***, 68-78.

Self-Determination Theory

Extrinsic Motivation

"(…) refers to the performance of an activity in order to attain some separable outcome and, thus, contrasts with intrinsic motivation, which refers to doing an activity for the inherent satisfaction of the activity itself."

Intrinsic Motivation

"The inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn"

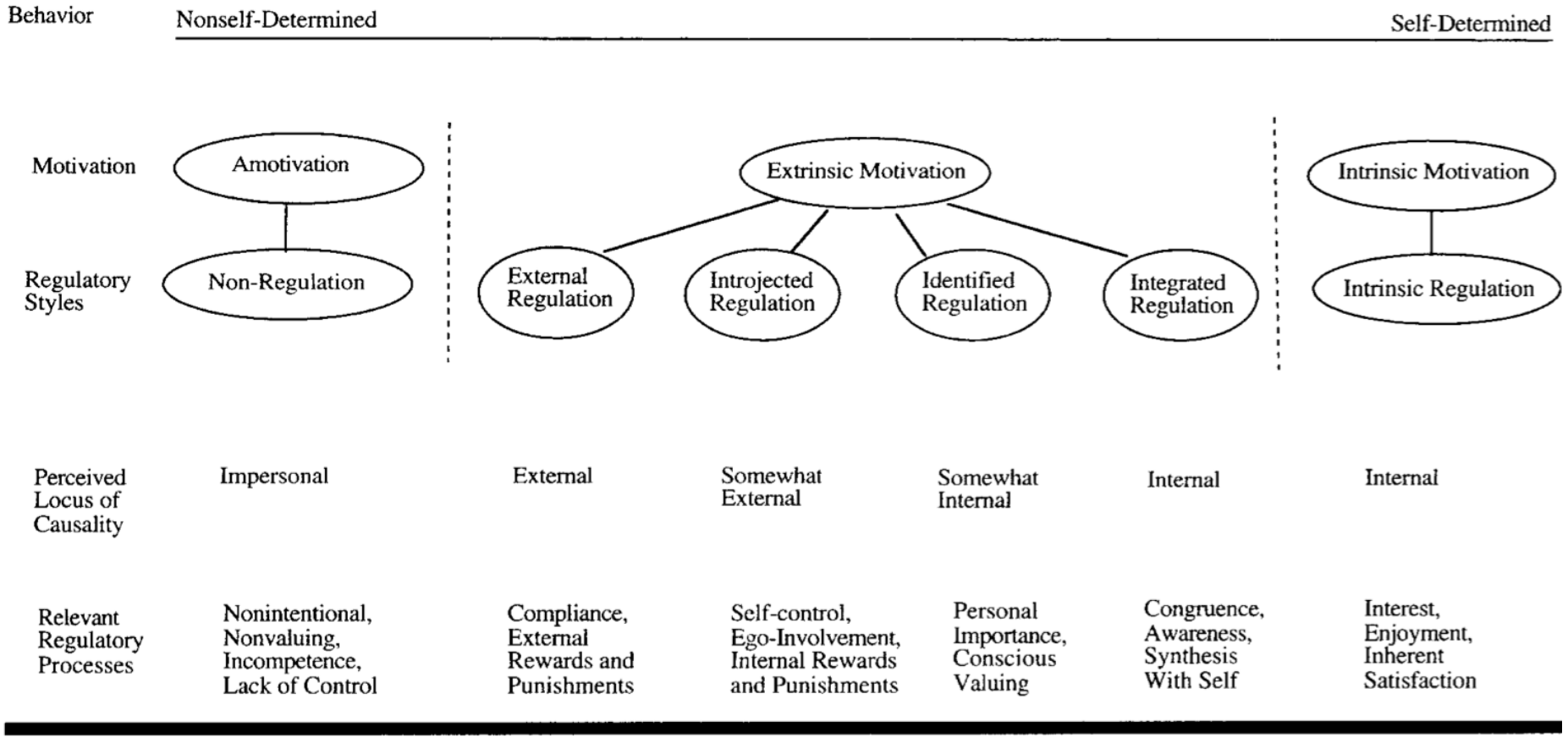
Self-determination theory doesn't just consider **amount** but also **type of motivation**…

Type of Motivation	**Study example**
Amotivation	"Why am I here, really? I'll never pass the exam."
External Regulation	"I study because my parents will be mad if I fail."
Introjected Regulation	"I'd feel guilty if I didn't study."
Identified Regulation	"I study because it's important for my career goals."
Integrated Regulation	"Studying fits with my values and who I want to be."
Intrinsic Motivation	"I study because I enjoy learning new things."

Ryan, R. M. & Deci, E.L. (2000). Self determination theory and the facilitation of intrinsic motivation, social development, and well-being. ***American Psychologist, 55***, 68-78.

Self-Determination Theory

Figure 1
The Self-Determination Continuum Showing Types of Motivation With Their Regulatory Styles, Loci of Causality, and Corresponding Processes



Ryan, R. M. & Deci, E.L. (2000). Self determination theory and the facilitation of intrinsic motivation, social development, and well-being. ***American Psychologist, 55***, 68-78.

Self-Determination Theory

Consequences

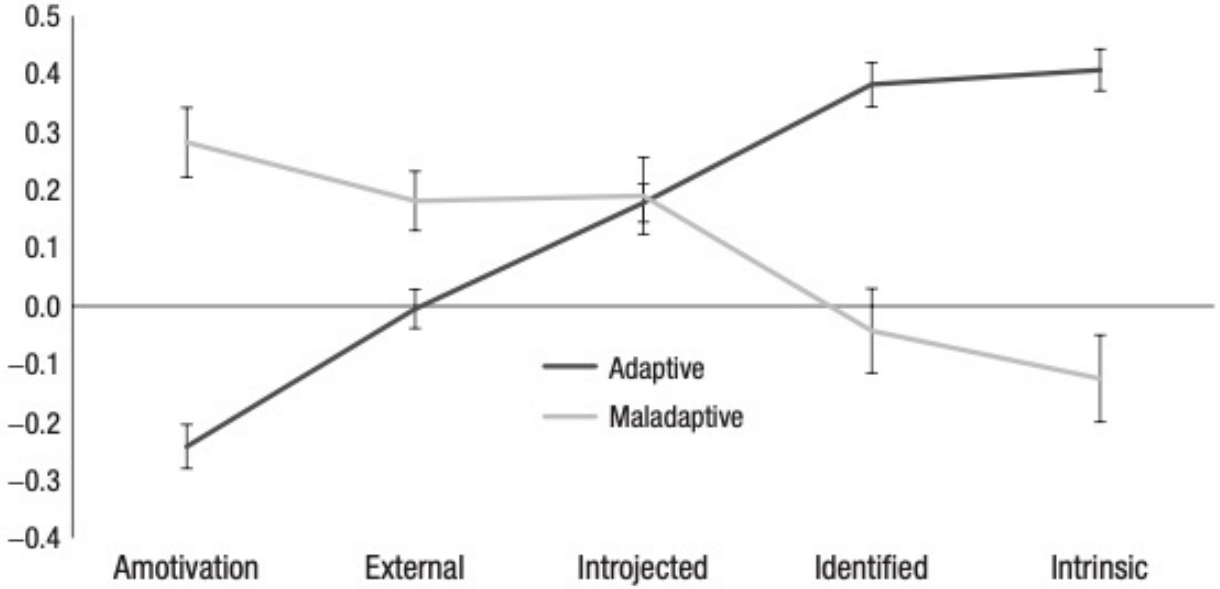
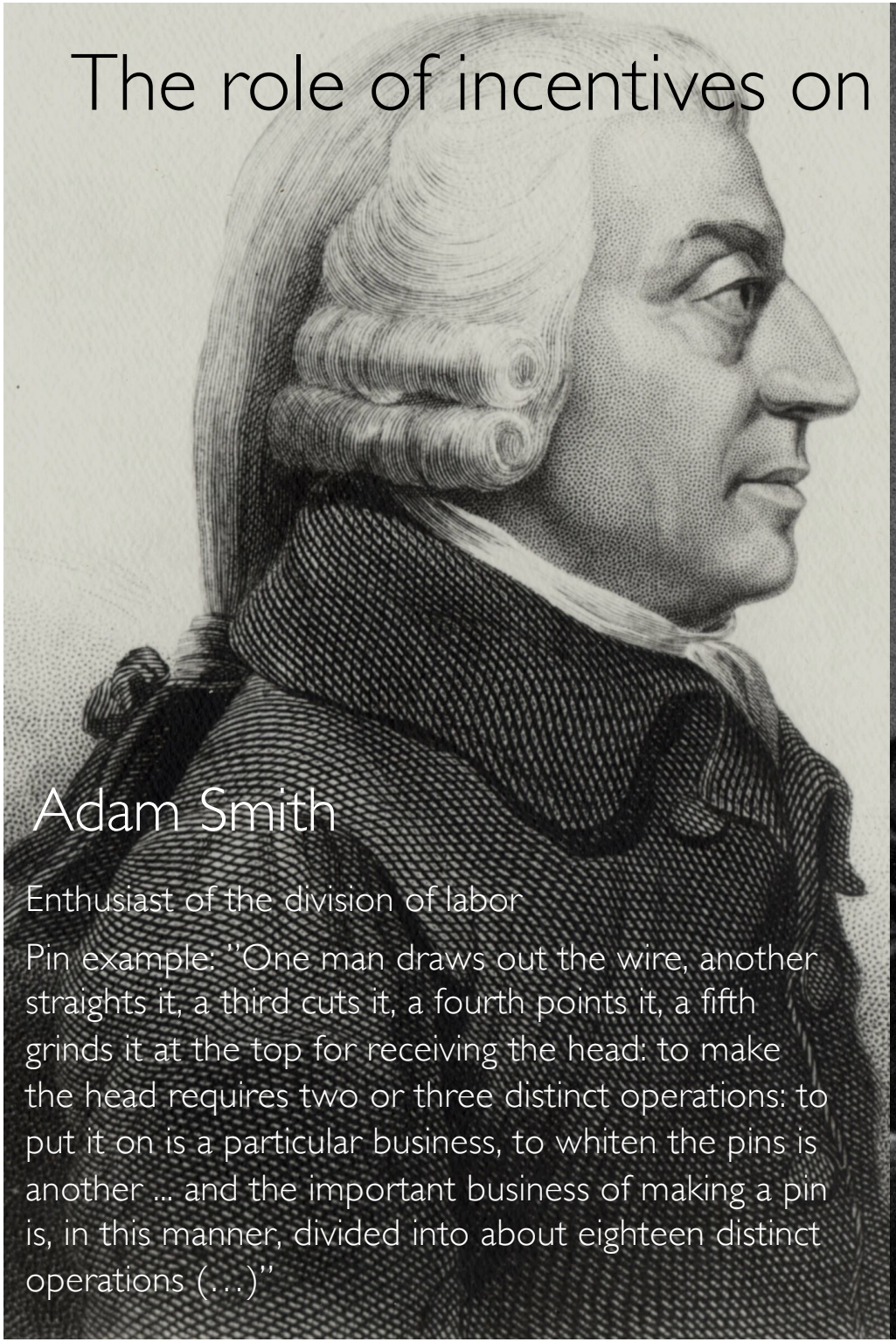


Fig. 3. Graphical representation of the average relationship between motivation factors and adaptive and maladaptive outcomes. Error bars indicate 95% confidence intervals.

Howard et al. (2021) meta-analyzed correlational/cross-sectional data distinguishing between adaptive and maladaptive outcomes. Adaptive outcomes refer to behaviors, emotions, and cognitions that support positive functioning and well-being (e.g., objective academic performance, self-esteem, physical activity, engagement); in contrast, maladaptive outcomes encompass those that impede functioning or well-being (e.g., anxiety, depression, absenteeism).

Howard, J. L., Bureau, J., Guay, F., Chong, J. X. Y., & Ryan, R. M. (2021). Student motivation and associated outcomes: A meta-analysis from self-determination theory. *Perspectives on Psychological Science, 16*(6), 1300–1323. https://doi.org/10.1177/1745691620966789

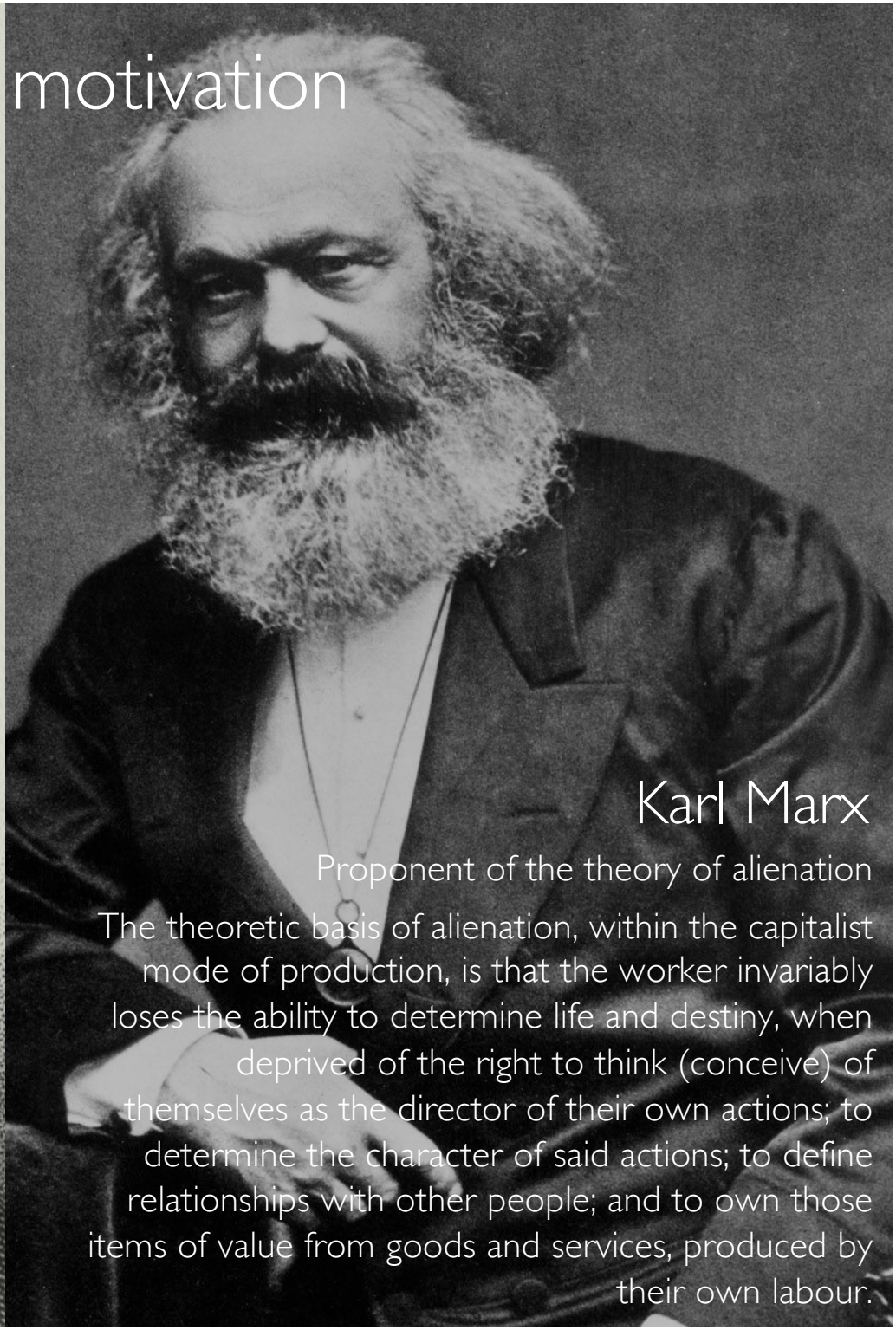
The role of incentives on motivation



Adam Smith

Enthusiast of the division of labor

Pin example: "One man draws out the wire, another straights it, a third cuts it, a fourth points it, a fifth grinds it at the top for receiving the head: to make the head requires two or three distinct operations: to put it on is a particular business, to whiten the pins is another ... and the important business of making a pin is, in this manner, divided into about eighteen distinct operations (…)"



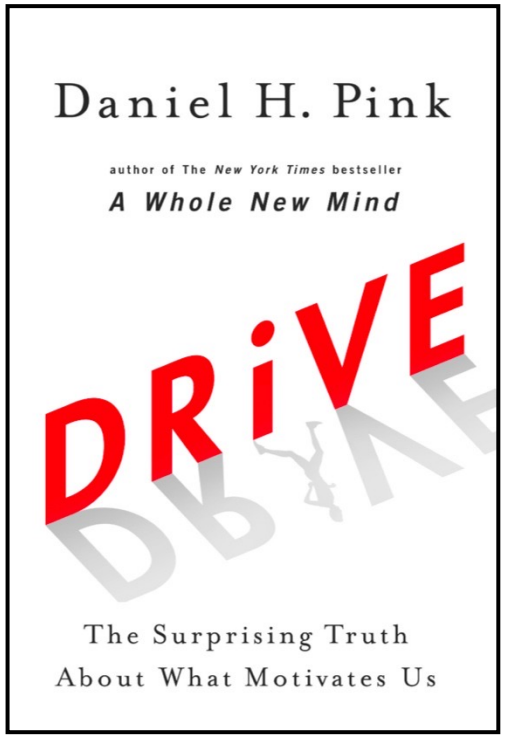
Karl Marx

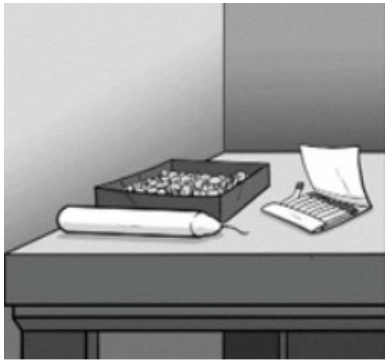
Proponent of the theory of alienation

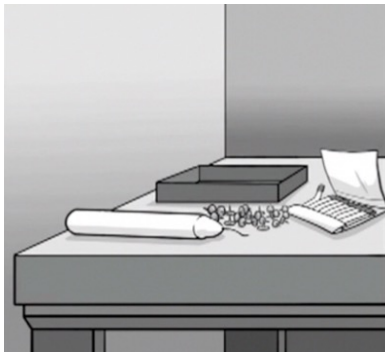
The theoretic basis of alienation, within the capitalist mode of production, is that the worker invariably loses the ability to determine life and destiny, when deprived of the right to think (conceive) of themselves as the director of their own actions; to determine the character of said actions; to define relationships with other people; and to own those items of value from goods and services, produced by their own labour.

The role of incentives on motivation

The candle problem







Glucksberg (1962) used a factorial design to study how motivation affects problem-solving. Participants attempted a version of the Candle Problem, where tacks and matches were either placed inside or outside a box. Additionally, some participants were offered a monetary reward for completing the task quickly, while others were not.

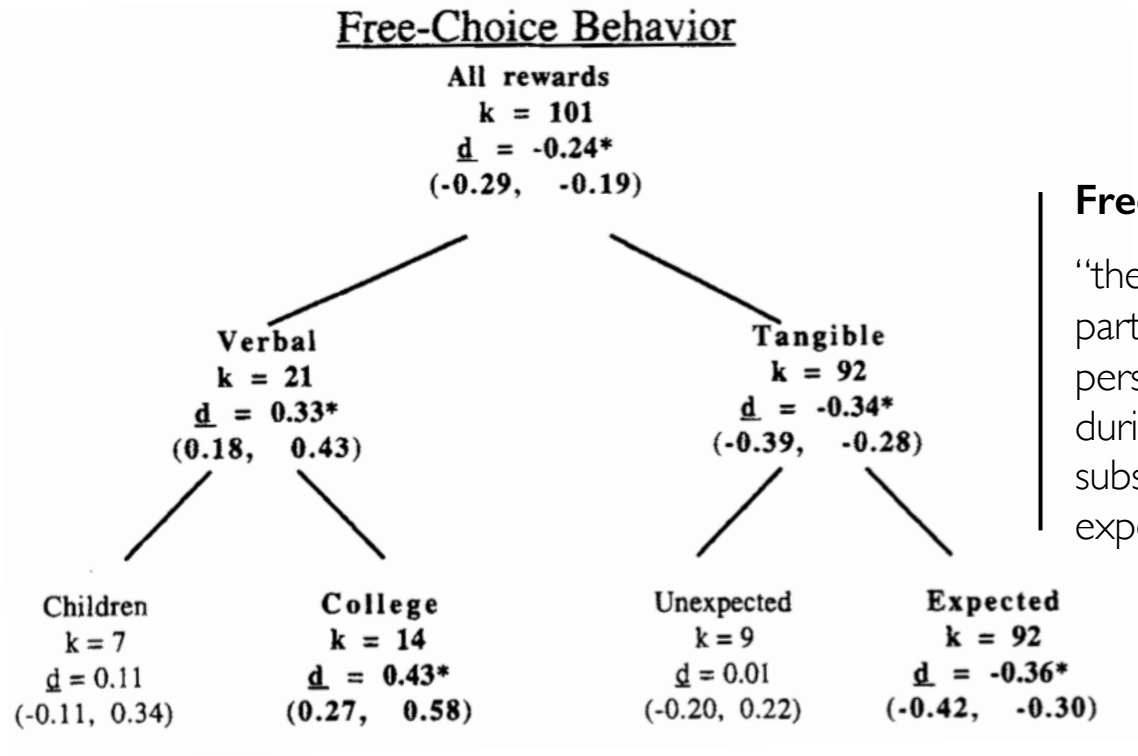
Performance was better when the box was empty (tacks outside) compared to when it was filled (tacks inside), showing the effect of functional fixedness. Overall, participants offered a reward performed better—except in the filled-box condition, where they actually performed worse than those in the control group. This suggests that incentives may sometimes hinder problem-solving by increasing mental rigidity.

The seminal study by Glucksberg is sometimes used (cf. Pink) to highlight that financial incentives may not always enhance performance, for example, when creative or flexible thinking is required. Many other paradigms have since been used in this area, including logic puzzles to test how incentives impact attention to detail and reasoning accuracy, the Remote Associates Test to assess creativity, word generation tasks to examine fluency, or arithmetic tasks to evaluate speed-accuracy trade-offs.

Glucksberg, S. (1962). The influence of strength of drive on functional fixedness and perceptual recognition. *Journal of Experimental Psychology, 63*, 36–41.

The role of incentives on motivation

Extrinsic vs. Intrinsic Motivation and Engagement



k = number of studies
d = effect size, (95%CIs)

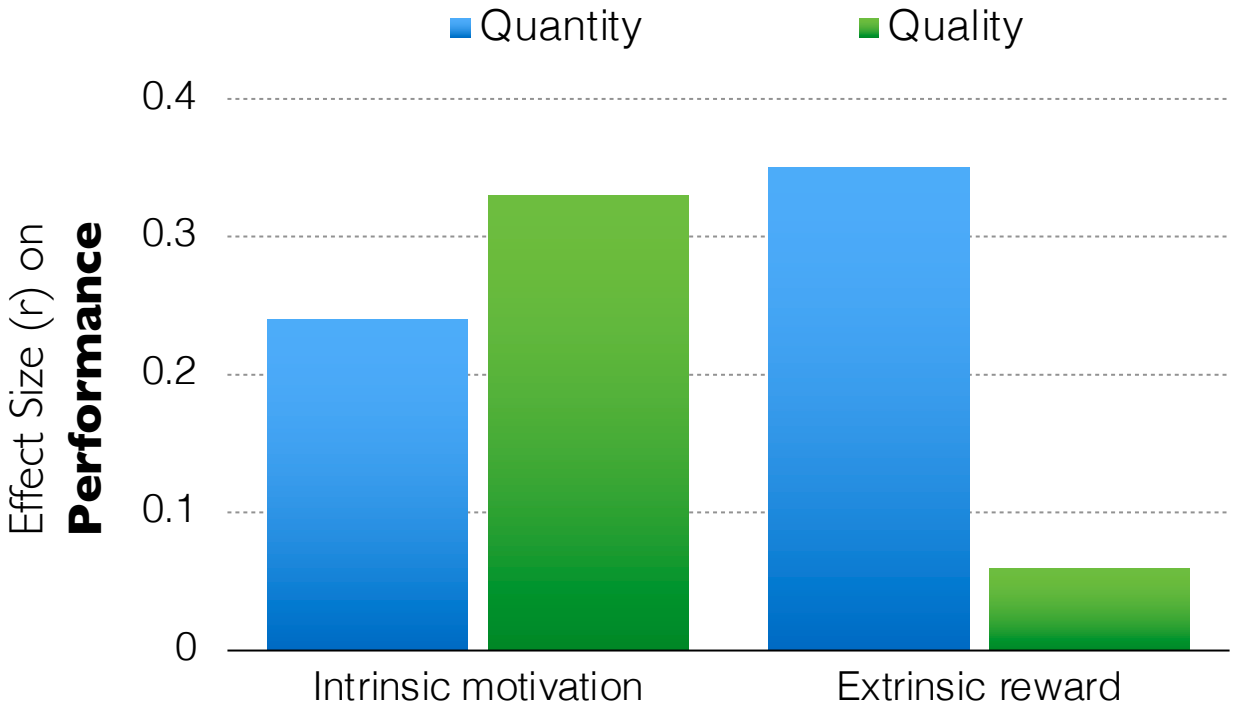
Free-choice behavior

"the degree to which participants return to and persist at the target activity during a free-choice period subsequent to the experimental phase"

Deci et al.'s results suggested that material (expected) incentives (e.g., money) led to lower engagement (**free-choice behavior**). In contrast, positive verbal feedback led to increased engagement.

Deci, E.L., Kostner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. ***Psychological Bulletin, 125***, 627-668.

The role of incentives on motivation



Cesaroli et al.'s results can also be seen as an argument for distinguishing between types of motivation: Intrinsic motivation (as measure by self-reported motivation) has overall average positive effects on both quantity and quality of performance. Extrinsic rewards (presence vs. absence of external rewards, such as monetary payoffs) have positive effects on the quantity but less so in the quality of performance (across different task types, not only free-choice ones). It should be noted this work presents no evidence of negative effects of extrinsic rewards…

Cerasoli, C. P., Nicklin, J. M., & Ford, M. T. (2014). Intrinsic motivation and extrinsic incentives jointly predict performance: A 40-year meta-analysis. ***Psychological Bulletin, 140***(4), 980–1008.

The role of incentives on motivation

Mindsets

http://www.youtube.com/watch?v=TTXrV0_3UjY

The role of incentives on motivation

Mindsets

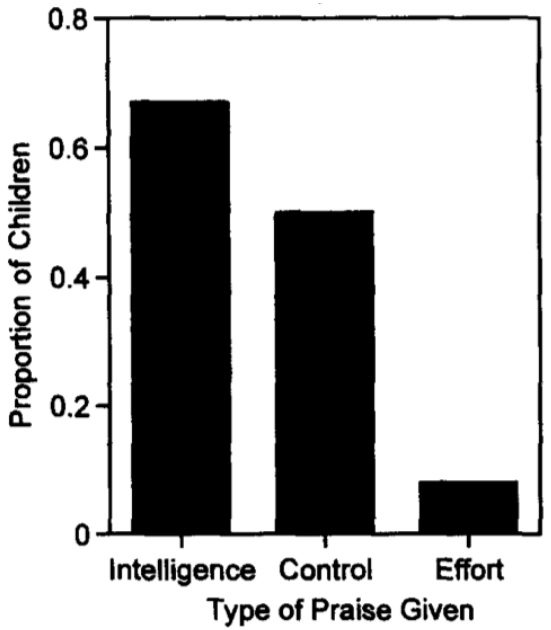
Children were asked to solve 10 Standard Progressive Matrices and, regardless of their performance, were told: "Wow, you did very well on these problems. You got [number correct] right. That's a really high score."

Intelligence
"You must be smart at these problems."

Effort
"You must have worked hard at these problems."

Control
"…"

Children were then asked about their goals by assessing whether they would like to do some more problems, "problems that I'll learn a lot from, even if I won't look so smart" (learning goal) vs. "problems that are pretty easy, so I'll do well" (performance goal).



Proportion of children who selected performance (rather than learning) goals plotted as a function of the type of praise given.

Contrary to the idea that positive feedback increases motivation, Mueller and Dweck's results suggest that praise for intelligence can have negative consequences for performance motivation relative to praise for effort.

Mueller, C. M., Dweck, C. (1998). Praise for intelligence can undermine children's motivation and performance. ***Journal of Personality and Social Psychology, 75***, 33–52

The role of incentives on motivation

Mindsets

Carol Dweck

2006

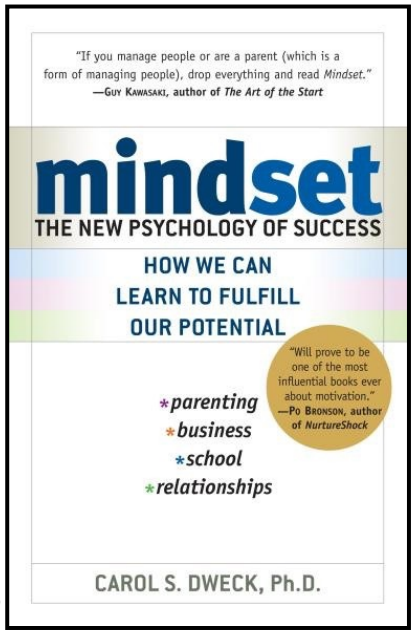


Table 1
Theories, Goals and Behavior Patterns in Achievement Situations

Theory of intelligence	Goal orientation	Perceived present ability	Behavior pattern
Entity (Intelligence is fixed)	Performance (Goal is to gain positive judgments/ avoid negative judgments of competence)	High	Mastery oriented (Seek challenge; high persistence)
		Low	Helpless (Avoid challenge; low persistence)
Incremental (Intelligence is malleable)	Learning (Goal is to increase competence)	High or low	Mastery oriented (Seek challenge that fosters learning; high persistence)

"In a ***fixed mindset*** students believe their basic abilities, their intelligence, their talents, are just fixed traits. They have a certain amount and that's that, and then their goal becomes to look smart all the time and never look dumb.

In a ***growth mindset*** students understand that their talents and abilities can be developed through effort, good teaching and persistence. They don't necessarily think everyone's the same or anyone can be Einstein, but they believe everyone can get smarter if they work at it."

Dweck, C. S., Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. ***Psychological Review, 95***, 256–273.

The role of incentives on motivation

Mindsets: Mixed empirical evidence

Macnamara & Burgoyne (2023): "Our meta-analytic results further suggested that apparent growth mindset intervention effects may be due to problematic study designs, flawed reporting, and bias. When no quality control was imposed, the meta-analytic model was significant. However, when imposing quality control by examining interventions that changed students' mindsets as intended or examining the highest-quality evidence, significant effects were conspicuously absent. Further, after correcting for publication bias, no meta-analytic models were significant. (…) In sum, despite the popularity of growth mindset interventions, the current evidence does not support claims that growth mindsets are beneficial for students' academic achievement."

but see Burnette et al. (2023) and Tipton et al. (2023)

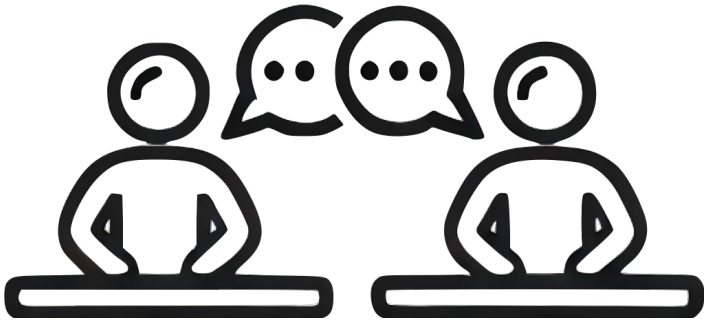
Burnette, J. L., Billingsley, J., Banks, G. C., Knouse, L. E., Hoyt, C. L., Pollack, J. M., & Simon, S. (2023). A systematic review and meta-analysis of growth mindset interventions: For whom, how, and why might such interventions work? *Psychological Bulletin*, *149*(3–4), 174–205. https://doi.org/10.1037/bul0000368

Macnamara, B. N., & Burgoyne, A. P. (2023). Do growth mindset interventions impact students' academic achievement? A systematic review and meta-analysis with recommendations for best practices. *Psychological Bulletin*, *149*(3–4), 133–173. https://doi.org/10.1037/bul0000352

Tipton, E., Bryan, C., Murray, J., McDaniel, M. A., Schneider, B., & Yeager, D. S. (2023). Why meta-analyses of growth mindset and other interventions should follow best practices for examining heterogeneity: Commentary on Macnamara and Burgoyne (2023) and Burnette et al. (2023). *Psychological Bulletin*, *149*(3–4), 229–241. https://doi.org/10.1037/bul0000384

BEHAVIOR CHANGE I

Person 1: Think of something that you'd like to change in your life; **Person 2**: Ask Person 1 about the behavior and argue why Person 1 **SHOULD** change the identified behavior.



Common pattern in counseling situations…

A person continues to smoke a pack of cigarettes a day, even after having a heart attack. Typical reactions by close ones and even health professionals assume…

- they haven't recognized the problem ("Don't you see that...?")

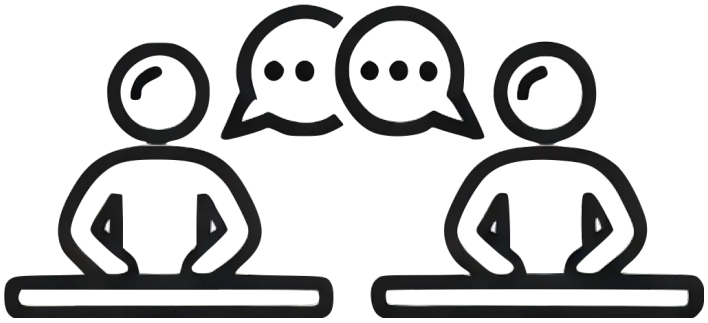
- they lack the knowledge ("Let me explain...")

- they don't have the ability (“Let me tell you how you...")

- they will profit from stress and pressure (“Otherwise, you…. ")

BEHAVIOR CHANGE II

Person 1: Think of something that you'd like to change in your life;
Person 2: Ask open questions, including about the advantages of the desired behavior/disadvantages of the undesired behavior.



Motivational Interviewing (MI)

- Client-centered technique "that works on facilitating and engaging **intrinsic motivation** within the client in order to change behavior"
- Compared with non-directive counseling, it's more focused and goal-directed. It departs from traditional Rogerian client-centered therapy through this use of direction, in which therapists attempt to influence clients to consider making changes, rather than non-directively explore themselves.
- The counselor is intentionally directive in pursuing the examination and developing discrepancy so as to generate behaviour change.
- Meta-analysis suggests small to medium effects in various settings, including short forms (cf. Lundahl et al. 2010).

Table 1. Four Underlying Principles of Motivational Interviewing*

Underlying Principles	Exemplar Statements
Express empathy	Acceptance facilitates change. Skillful reflective listening is fundamental. Ambivalence is normal.
Develop discrepancy	The client rather than the counselor should present the arguments for change. Change is motivated by a perceived discrepancy between present behavior and important goals or values.
Roll with resistance	Avoid arguing for change. Resistance is not directly opposed. New perspectives are invited but not imposed. The client is a primary source in finding answers and solutions. Resistance is a signal to respond differently.
Support self-efficacy	A person's belief in the possibility of change is an important motivator. The client, not the counselor, is responsible for choosing and carrying out change. The counselor's own belief in the person's ability to change becomes a self-fulfilling prophecy.

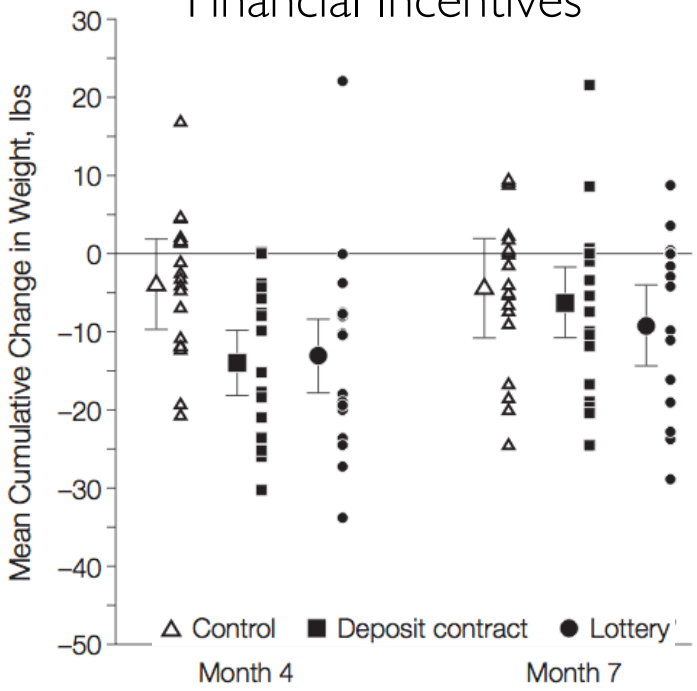
Miller, W.R., & Rollnick, S. (2012). Motivational interviewing: Helping people change. Guilford Press

Lundahl, B. W., Kunz, C., Brownell, C., Tollefson, D., & Burke, B. L. (2010). A meta-analysis of motivational interviewing: Twenty-five years of empirical studies. *Research on Social Work Practice, 20*(2), 137–160. https://doi.org/10.1177/1049731509347850

The role of incentives on motivation

There is an ongoing debate about the role of incentives relative to other methods (e.g., motivational interviewing) in effecting long-term effects across domains (e.g., weight loss, physical activity, vaccination)

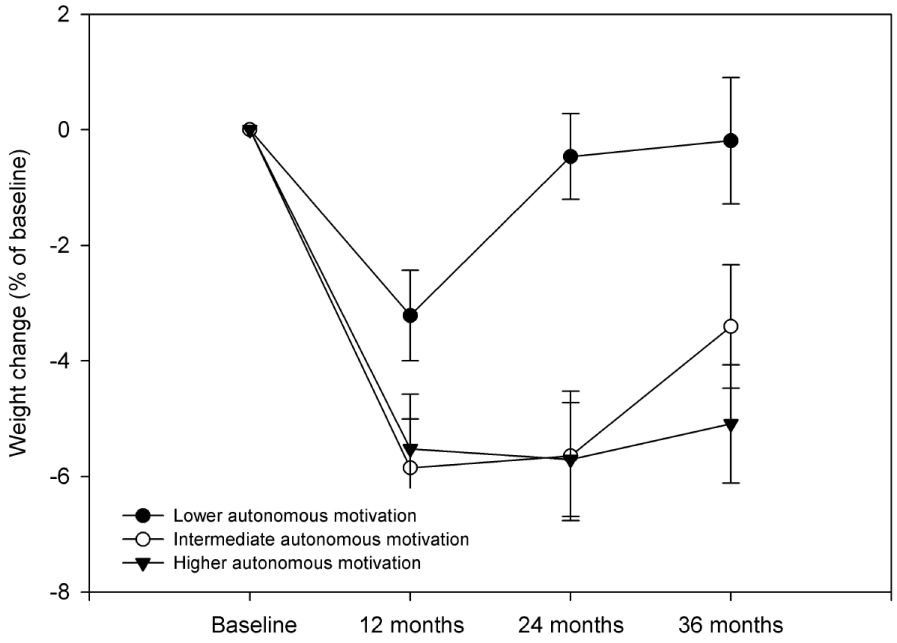
Financial Incentives



RCT with groups randomized to 3 weight loss plans (for 16 weeks): monthly weigh-ins (control), a deposit contract involving participants' own money plus matching from the experimenters, and a lottery incentive program in which participants could win money daily if they met their weight-loss goal for that day.

Volpp, K, John, L. Troxel, A. Norton, L, Fassbender, J., & Loewenstein, G, (2008). Financial incentive based approaches for weight loss: A randomized trial. ***The Journal of the American Medical Association, 300***, 2631–2637.

Motivational Interviewing



RCT with intervention focused on promoting autonomous forms of exercise regulation and intrinsic motivation (e.g., Motivational Interviewing), or a general health education program (controls).

Teixeira, P. J., Silva, M. S., Mata, J., Palmeira, A. L., & Markland, D. A. (2012). Motivation, self-determination, and long-term weight control. ***International Journal of Behavioral Nutrition and Physical Activity, 9***, 1-13.

The role of incentives on motivation

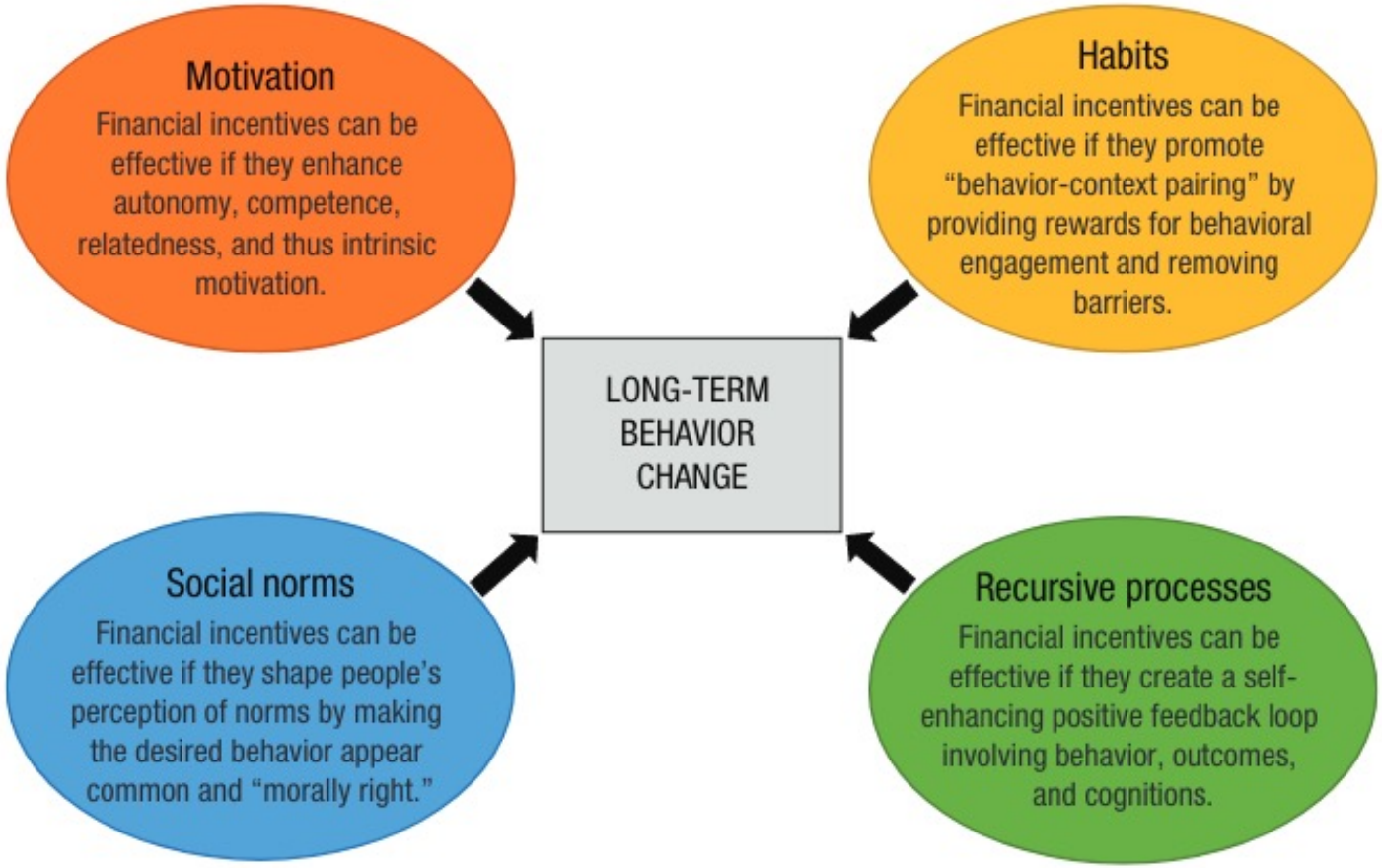


Fig. 1. Four proposed psychological constructs that influence long-term behavior change in the context of financial-incentive programs.

While there are (theoretical) reasons to think that financial incentives could lead to long-term behavior change, there is little supporting empirical evidence for any of these at this point. More research is needed…

Winkler-Schor, S., & Brauer, M. (2024). What happens when payments end? Fostering long-term behavior change with financial incentives. *Perspectives on Psychological Science*. https://doi.org/10.1177/17456916241247152

Summary

- **Self-determination theory (SDT)**: SDT highlights the importance of satisfying basic psychological needs—autonomy, competence, relatedness—to foster motivation and well-being; helps distinguish different types (extrinsic – intrinsic continuum) rather than simply amount of motivation.
- **Incentivization:** SDT suggests material rewards may undermine intrinsic motivation; empirical evidence suggests this may be the case in some situations (i.e., free choice after receiving payment); however, meta-analyses suggest incentives can be used to increase performance (perhaps with magnitude distinctions for quality vs. quantity).
- **Mindsets:** Cognitive theories suggest that fixed vs. growth mindsets influence motivation, with praise for effort supporting motivation more effectively than praise for intelligence. However, recent meta-analyses show mixed evidence for the overall effectiveness of growth mindset interventions.
- **Behavior change:** Intrinsic motivation can be changed. One technique is motivational Interviewing - a client-centered technique with links to SDT principles to generate intrinsic desire for change. Overall, long-term behavior change is a hard problem for psychology and the behavioral sciences…

Session information

Sessions take place Tuesdays, 10.15-11.45, Biozentrum, Maurice E. Müller Saal U1.111.

Please note that the **Exam** takes place on 03.06.2025, from 08.00 to 10.00, at the DSBG Neubau, Sporthalle 1. The **Repeat Exam** is scheduled for 21.07.2025, from 10.00 to 12.00, at the Biozentrum, Hörsaal U1.131.

#	Date	Topic	Slides	Instructor
1	18.02.2025	Emotion: What is an emotion?	pdf	Mata
2	25.02.2025	Emotion: What is an emotion? (continued)	pdf	Mata
3	18.03.2025	Emotion: Neural bases	pdf	Tisdall
4	25.03.2025	Emotion: Regulation	pdf	Mata
5	01.04.2025	Emotion: Well-being	pdf	Mata
6	08.04.2025	Motivation: What is motivation?	pdf	Mata
7	15.04.2025	Motivation: Extrinsic vs intrinsic motivation		Mata
8	29.04.2025	Motivation: Neural bases		Tisdall
9	06.05.2025	Motivation: Cooperation and morality		Theisen
10	13.05.2025	Applications		Mata
11	20.05.2025	Wrap-up and Q&A		Mata
12	03.06.2025	Exam (DSBG Neubau)		
13	21.07.2025	Repeat Exam (Biozentrum)		

Note. Slides will be made available shortly before each session.

Please submit questions for Q&A by **May 13th** via **ADAM**

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