

Kognitionspsychologie II: Session 7

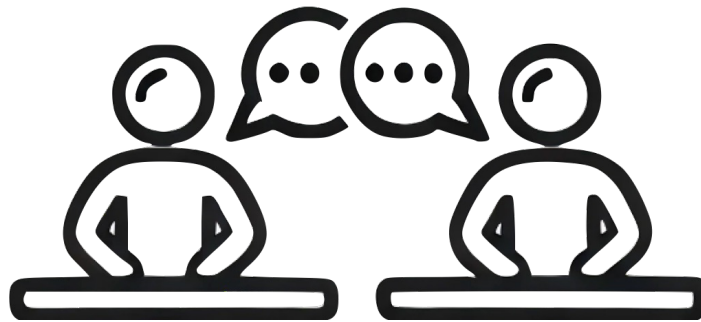
Motivation: Extrinsic vs intrinsic motivation

Rui Mata, FS 2026

Version: April 7, 2026

BEHAVIOR CHANGE

WOULD YOU STUDY HARDER AND/OR BETTER
IF PAID 10 CHF/HOUR?

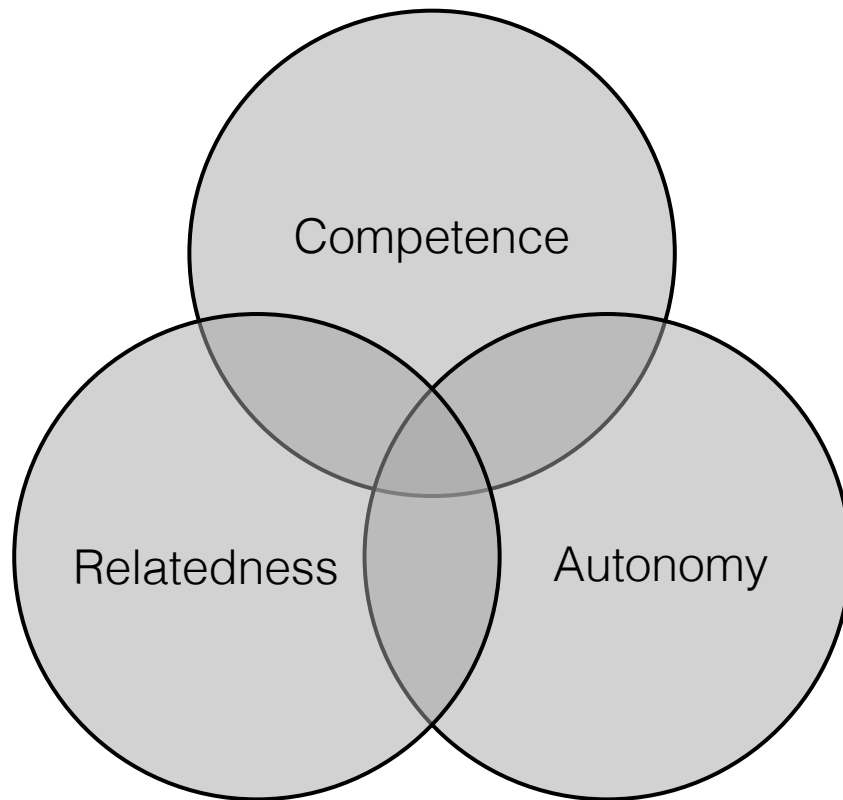


Learning Objectives

- Distinguish between **extrinsic** and **intrinsic** motivation
- Learn about the empirical literature on **incentivization** and its relation to motivation and performance
- Learn about alternatives to incentivization (e.g., **motivational interviewing**) and discuss related promises and challenges

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

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

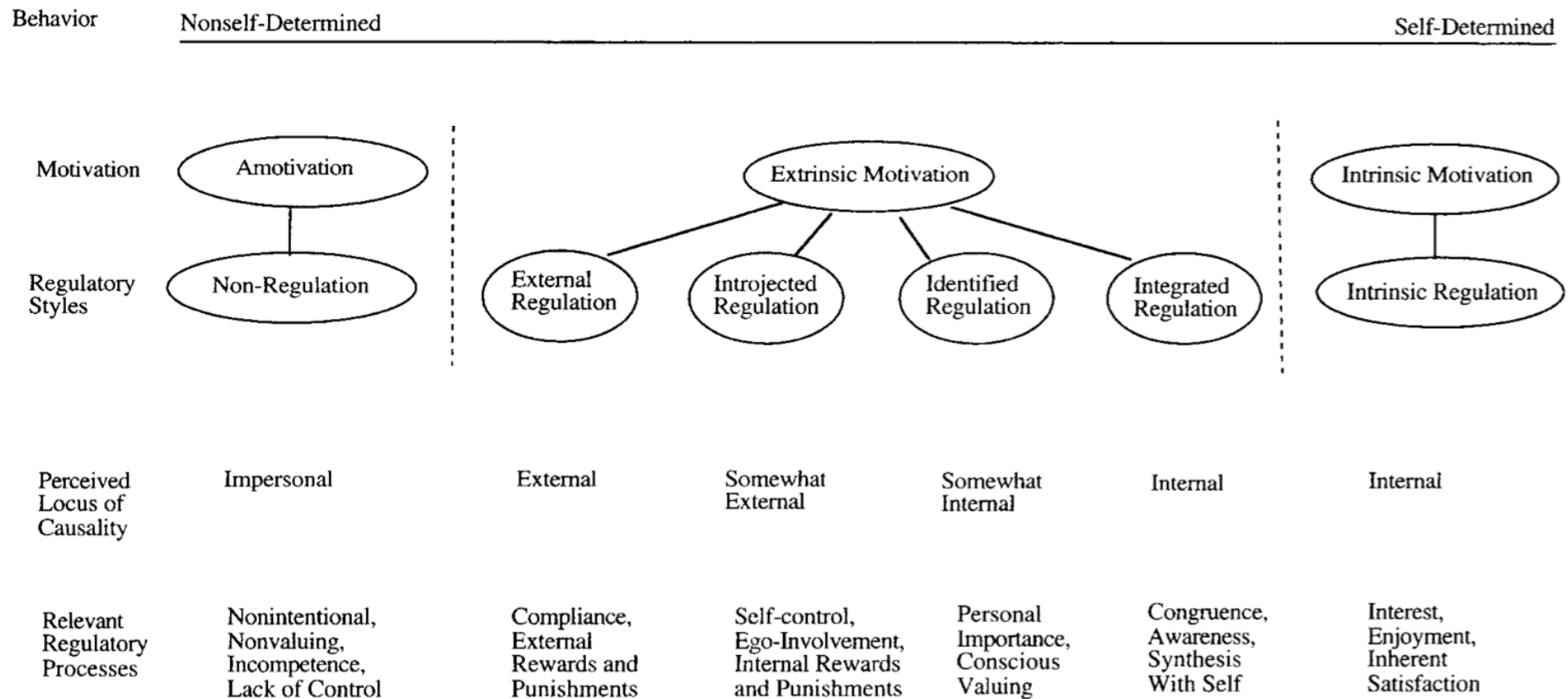
“I study because I enjoy learning new things.”

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: Adaptive vs maladaptive outcomes

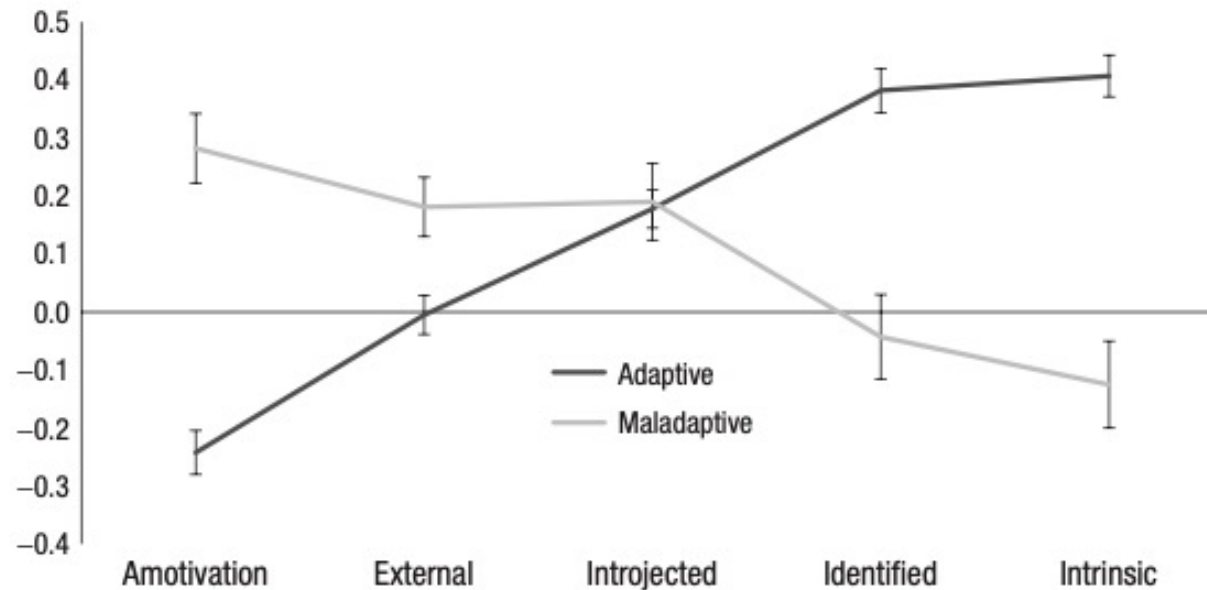


Fig. 3. Graphical representation of the average relationship between motivation factors and adaptive and maladaptive outcomes. Error bars indicate 95% confidence intervals.

Howard et al. (2021) meta-analyzed correlational/cross-sectional data distinguishing between adaptive and maladaptive outcomes in school contexts. 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

An engraving of Adam Smith, showing him in profile from the chest up. He has long, wavy white hair and is wearing a dark, high-collared coat.

Adam Smith

Enthusiast of the division of labor

Pin example: "One man draws out the wire, another straightens 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 (...)"

Financial incentives work!

A black and white portrait of Karl Marx, showing him from the chest up. He has a full, white beard and is wearing a dark suit jacket over a white shirt and a dark cravat.

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.

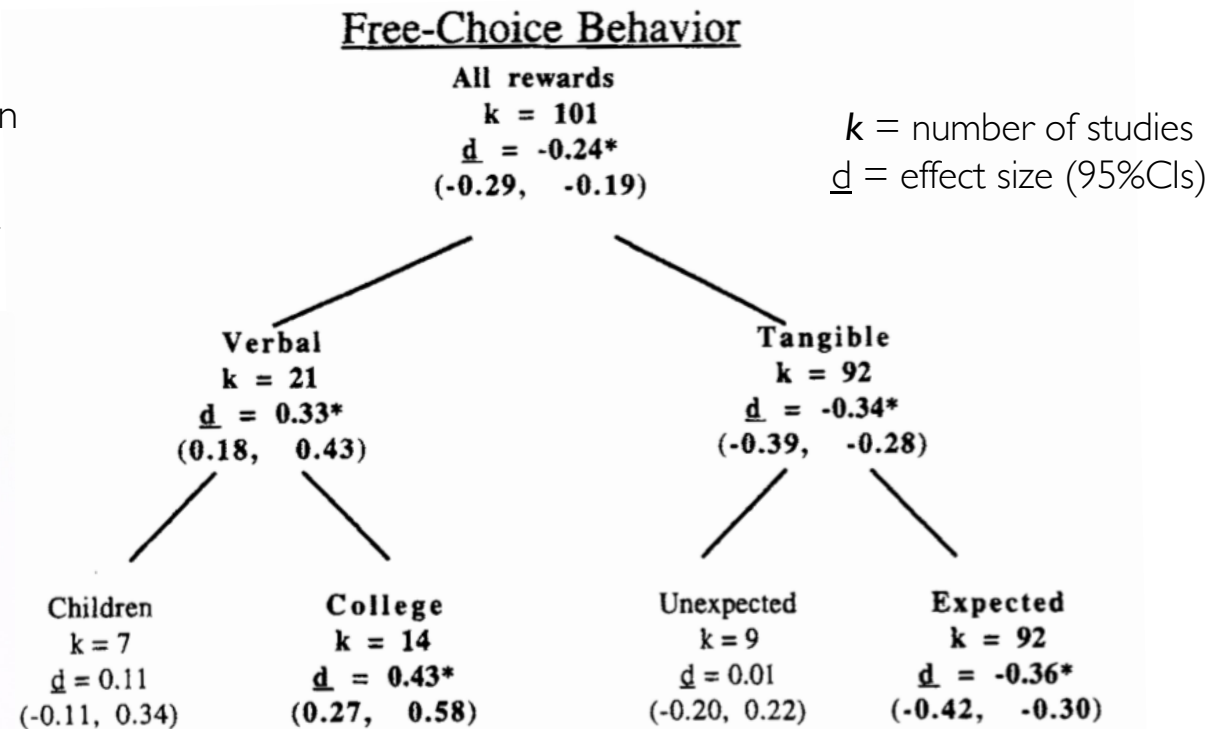
Financial incentives alienate!

The role of incentives on motivation

Free-choice behavior (intrinsic motivation)

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”

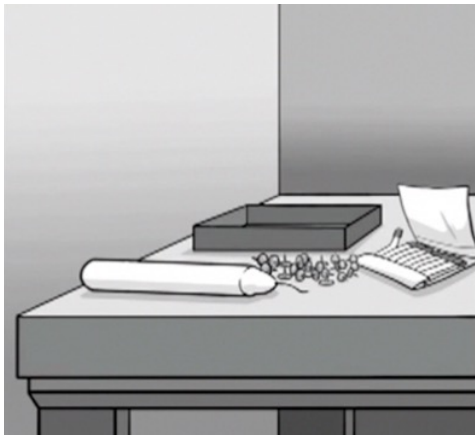


Deci et al analyse results of extrinsic rewards on motivation (free-choice behavior): Deci et al.'s results suggested that material (expected) tangible incentives (e.g., money) led to lower engagement. In contrast, positive verbal feedback led to increased engagement. According to SDT, results suggest that expected rewards can undermine intrinsic motivation by reducing autonomy (while, positive feedback can enhance it by supporting competence).

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

Task performance: The candle problem



Participants are given a candle, a box of tacks, and matches, and asked to fix the candle to a wall so that it could burn without dripping wax on the table. The key insight is to use the box as a candle holder—but many people don't see this because they think of the box only as a container for the tacks (this is called functional fixedness). In the experiment, sometimes the tacks were inside the box (making the box seem like a container), and sometimes they were outside (making the box easier to see as a tool). In addition, some participants were offered a monetary reward for solving the task quickly. Results showed that rewards helped in the easier condition—but in the harder condition (where the box was filled), rewards actually made performance worse. This suggests that incentives can sometimes impair problem-solving by narrowing attention and increasing mental rigidity—especially when flexible thinking and creativity 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.

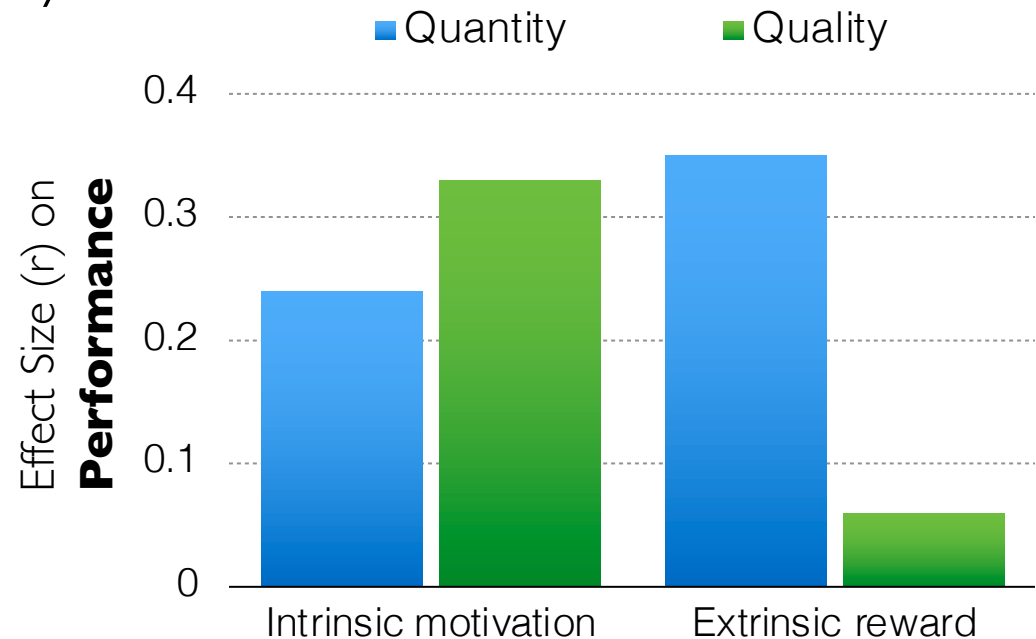
Glucksberg, S. (1962). The influence of strength of drive on functional fixedness and perceptual recognition. *Journal of Experimental Psychology*, 63, 36–41.

The role of incentives on motivation

Task performance: Meta-analysis

Cesaroli et al.'s meta-analyse motivational effects on task performance distinguishing between quantity and quality:

Task type	Quantity	Quality
Math problems	# solved	% correct
Creativity	# ideas	originality



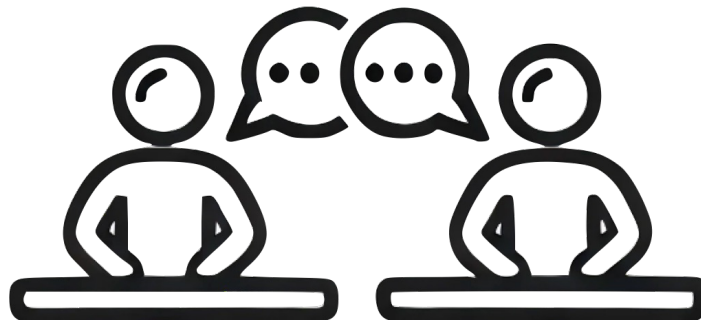
Intrinsic motivation (as measure by self-reported motivation) has overall average positive effects on both quantity and quality of performance. Extrinsic rewards (e.g., monetary payoffs) have positive effects on the quantity but less so in the quality of performance. The results suggest that motivation can affect quantity and quality differently because extrinsic incentives increase effort and output focus, whereas intrinsic motivation enhances deep engagement, flexibility, and persistence, which are critical for high-quality and creative performance.

Cesaroli, 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.

BEHAVIOR CHANGE

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.



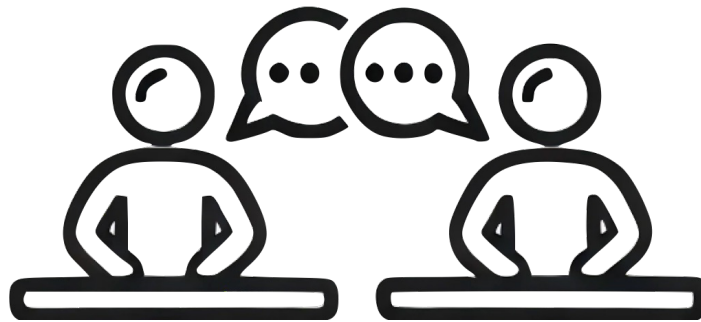
Common pattern in counseling situations...

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

- 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

Person 1: Think of something that you'd like to change in your life;
Person 2: Ask open questions about the reasons for change, work out the advantages of the desired behavior and the 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”
- The counselor is intentionally directive in pursuing the examination and developing discrepancy so as to generate behaviour change.
- It share features with but also 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.
- 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*

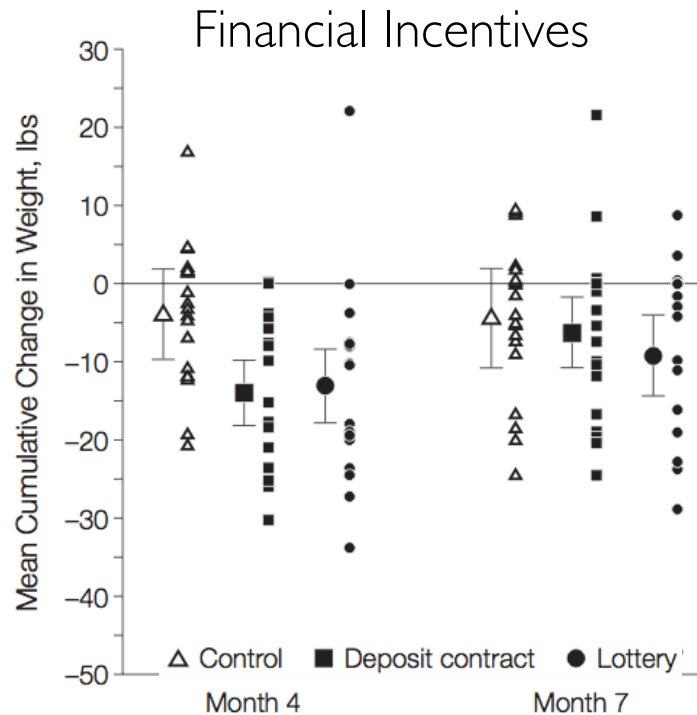
Underlying Principles	Exemplar Statements
Express empathy	Acceptance facilitates change. Skillful reflective listening is fundamental. Ambivalence is normal.
Develop discrepancy	The client rather than the counselor should present the arguments for change. Change is motivated by a perceived discrepancy 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>

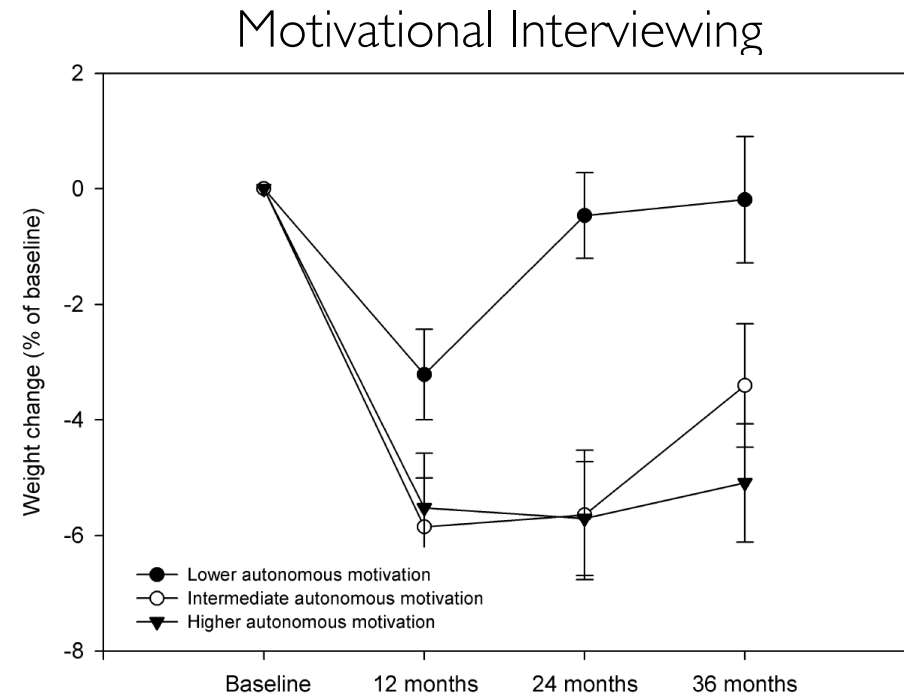
The role of incentives on motivation

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)



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.



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.

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 tasks); meta-analytic evidence suggest incentives can be used to increase task performance but with magnitude distinctions for quality vs. quantity.
- **Behavior change:** Intrinsic motivation can be changed. One technique is motivational Interviewing - a client-centered technique which can be seen to use SDT principles to generate intrinsic desire for change. Overall, long-term behavior change remains a hard problem for psychology and the behavioral sciences...

Daniel H. Pink

author of *The New York Times* bestseller

A Whole New Mind

DRiVE

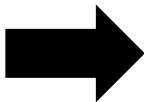
The Surprising Truth
About What Motivates Us

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 03.06.2026, from 08.00 to 10.00, at the DSBG Neubau, Sporthalle 1. The **Repeat Exam** is scheduled for 20.07.2026, from 10.00 to 12.00, at the Vesalianum, Grosser Hörsaal (EO.16).

#	Date	Topic	Slides	Instructor
1	17.02.2026	Emotion: What is an emotion?	pdf	Mata
2	03.03.2026	Emotion: What is an emotion? (continued)	pdf	Mata
3	10.03.2026	Emotion: Neural bases	pdf	Tisdall
4	17.03.2026	Emotion: Regulation	pdf	Mata
5	24.03.2026	Emotion: Well-being	pdf	Mata
6	31.03.2026	Motivation: What is motivation?	pdf	Mata
7	07.04.2026	Motivation: Extrinsic vs intrinsic motivation		Mata
8	14.04.2026	Motivation: Neural bases		Tisdall
9	28.04.2026	Motivation: Cooperation		Theisen
10	05.05.2026	Motivation: Morality		Theisen
11	12.05.2026	Applications		Mata
12	19.05.2026	Wrap-up and Q&A		Mata
13	03.06.2026	Exam (DSBG Neubau)		
14	20.07.2026	Repeat Exam (Vesalianum)		



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



Universität
Basel

Bernoulli Network for the Behavioral Sciences

The Bernoulli Network for the Behavioral Sciences
invites you to the research talk

**Deliberate Ignorance:
Why We Choose Not to Know**

Prof. Dr. Ralph Hertwig

Director, Center for Adaptive Rationality
Max Planck Institute for Human Development, Berlin

Tuesday, 14 April 2026 | 18:00

Maurice Müller Hörsaal, Biozentrum
No registration required