**Empathy Gap Bias**

**Bias Definition**

The "empathy gap" refers to a cognitive bias where people underestimate the influences of visceral drives on their own attitudes, preferences, and behaviors. Typically, this gap manifests when a person is in one state (e.g., calm, content) and fails to accurately predict their behavior or decisions when in a different state (e.g., angry, hungry, in pain). This can also apply when judging others' actions without considering their emotional or physical state, leading to misunderstandings or misjudgments.

**Ten scenarios of Empathy Gap Bias**

1. **Marathon Registration:** Maria feels invigorated after watching a marathon on TV and immediately signs up for one herself, inspired by the runners' exhilaration. However, as her training begins, she encounters the physical challenges and fatigue she hadn't considered in her initial excitement. The daily grind makes her question her decision as she struggles to match her emotional state during sign-up with her current fatigue and stress.
2. **Fitness Routine Overconfidence:** On a Sunday evening, Alex feels rejuvenated after a restful weekend and decides to leverage this energy by committing to a new fitness routine, signing up for 6:00 AM workout sessions. As the week progresses, however, Alex's enthusiasm diminishes significantly; the allure of a warm bed and the early morning cold make waking up increasingly difficult.
3. **Healthy Eating Plans:** After a doctor's visit, Jordan is highly motivated to improve his health. He throws out all junk food and plans a strict diet of salads and smoothies. By midweek, his initial resolve fades in the face of a stressful work schedule, leading him to crave comfort foods. He didn't account for how stress affects his food choices, showing an empathy gap between his motivated and stressed selves.
4. **Budgeting Enthusiasm:** Emily attends a personal finance seminar and is immediately enthusiastic about saving money. She creates a tight budget, planning to save a significant portion of her income. However, when faced with an unexpected sale at her favorite store, she makes impulsive purchases, forgetting the financial constraints she had set for herself during her motivated state.
5. **Volunteering Commitment:** Kevin signs up to volunteer at a local shelter during a community fair, moved by stories of need and support. His first few shifts go well, but as the novelty wears off and his busy life presses in, the early morning starts and long hours begin to feel overwhelming. He hadn't anticipated the emotional drain and physical tiredness in his initial enthusiasm.
6. **New Hobby Excitement:** Lisa attends a pottery class and loves the experience. She buys all the materials to do it at home, imagining spending her weekends crafting. When she starts, she realizes that without the structure of the class and the presence of an instructor, her motivation dips, and the hobby feels more frustrating than therapeutic.
7. **Study Plans:** After an inspiring career talk, Tom is determined to improve his qualifications and enrolls in an online course. His plan to study every evening fails to consider his exhaustion after work, leading to missed sessions and a pile-up of course materials. He didn't anticipate the empathy gap between his motivated and weary states.
8. **Pet Adoption:** Sarah visits an animal shelter and falls in love with a puppy. Caught up in the moment, she adopts it, imagining joyful walks and playtime. A week later, the reality of early morning walks, training, and clean-ups, especially after tiring days at work, hits her. She struggles with the responsibilities she hadn't fully considered in her initial joy.
9. **Career Change Leap:** After a successful project, David feels unchallenged and immediately starts looking for a new job in a different field, excited by the prospect of change. However, once he receives an offer and starts the new role, the unfamiliar tasks and office culture make him miss his old job. He hadn't considered how his current success colored his view of a new role.
10. **Social Planning Overload:** At the start of the week, Anita feels lonely and plans a full schedule of social activities for the weekend. As the weekend approaches, she feels overwhelmed by the prospect of so little downtime. Her initial feelings of loneliness didn't account for her need to recharge alone.

**User Story for the scenario "Fitness Routine Overconfidence"**

It's Sunday evening, and Alex is feeling particularly motivated after a weekend of relaxation and light activities. Looking to capitalize on this burst of energy, Alex decides it's the perfect time to commit to a new fitness routine. They sign up for a series of 6:00 AM workout sessions at the local gym, confident in their ability to wake up early and energized by the thought of transforming their fitness level.

However, as the week progresses, Alex's initial enthusiasm begins to wane. The comfort of a warm bed and the chill of the early morning make getting up increasingly difficult. By Wednesday, the alarm clock's siren call is met with dread, and by Friday, Alex hits the snooze button one too many times, missing the workout entirely.

Reflecting on the week's challenges, Alex realizes they underestimated how their morning disposition could change, especially when faced with the reality of early wake-up calls. Determined to not let this setback derail their fitness goals, Alex starts looking for strategies to make morning workouts more appealing.

**Competency questions**

1. **How does Alex's initial positive emotional state affect the accuracy of their prediction regarding the ability to maintain the new fitness routine?**

Alex's initial positive emotional state led to an overestimation of their ability to maintain the new fitness routine, resulting in low prediction accuracy.

1. **How is Alex’s state classified throughout the week as they experience changing motivations?**

Alex’s state is classified as fluctuating between motivated and demotivated, influenced by both physical and emotional factors.

**Classes and properties**

Version of Ontology builder from Chat GPT

Classes:

1. **EmpathyGap**: A cognitive bias where a person underestimates the influence of different emotional or physical states on their decisions or behaviors.
2. **Individual**: The person experiencing or demonstrating the empathy gap.
3. **State**: Emotional, physical, or situational states that an individual can be in, which might influence their judgments or behaviors.
4. **Behavior**: Actions or decisions made by individuals, often influenced by their current or anticipated state.
5. **Scenario**: Specific situations or contexts in which the empathy gap is observed.
6. **Strategy**: Methods or approaches used to overcome or address the challenges posed by the empathy gap.

Properties:

1. **hasState** (domain: Individual, range: State)

* Connects an individual to their emotional or physical state.

1. **demonstratesBehavior** (domain: Individual, range: Behavior)

* Describes the behavior exhibited by an individual, influenced by their state.

1. **isInfluencedBy** (domain: Behavior, range: State)

* Indicates that a behavior is influenced by a specific state.

1. **experiencesGap** (domain: Individual, range: Empathy Gap)

* Indicates that an individual is experiencing the empathy gap.

1. **appliesStrategy** (domain: Individual, range: Strategy)

* Describes the strategy an individual uses to address or mitigate the effects of the empathy gap.

1. **belongsToScenario** (domain: Empathy Gap, range: Scenario)

* Associates the empathy gap with specific scenarios in which it is observed.

Our Changes

Classes:

1. **BiasedAgent**

* Represents an entity that experiences the bias.

1. **NonBiasedAgent**

* An idealized entity that makes decisions based on objective analysis, facts, and logical reasoning, without being affected by cognitive biases.

1. **CognitiveBias**

* Represents the overarching concept of cognitive biases.

1. **PhysicalState**

* Refers to the current condition of an entity's body, encompassing aspects like health, energy levels, fatigue, and overall physical well-being. Has a type (predefined string as "positive", "negative", etc.)

Properties:

1. **affectedBy** (domain: BiasedAgent, range: EmpathyGap)

* Describes a relationship between entities on the base of influence.

**Framester Frames**

We used these frames for the classes’ alignment:

* **People** (<https://w3id.org/framester/data/framestercore/People>)

This frame contains general words for Individuals, i.e. humans. The Person is conceived of as independent of other specific individuals with whom they have relationships and independent of their participation in any particular activity. They may have an Age, Descriptor, Origin, Persistent\_characteristic, or Ethnicity. A man from Phoenix was shot yesterday. She gave birth to a screaming baby yesterday. I study 16-year-old female adolescents. I am dating an African-American man. She comforted the terrified child. I always thought of him as a stupid man.

Here is used to denote a human being and express that we are talking about human cognitive biases.

cbi:BiasedAgent => classification:isClassifiedBy=>fs:People

* **Accuracy** (<http://etna.istc.cnr.it/framester2/data/framestercore/Accuracy>)

An Agent is involved in an activity whose degree of success is dependent on a parameter of the action matching a particular set of values of a continuous variable or variables (e.g. quantity, location, time). The Agent, or metonymically the Instrument or Means action, is described in terms of the actual or expected Deviation between the location, time, or quantity in the activity and the location, time, or quantity which is necessary for the intended event. The Longview Rangefinder is accurate to within one foot per hundred yards . His estimate was off by an order of magnitude. The fork truck operator must be fairly accurate in his aim. The precision of the daily measurements is dependent on a number of factors.

In our case, this frame presents the accuracy of predicting of decisions.

fs:Predicting => parameter:hasParameter => fs:Accuracy

fs:Accuracy => parameter:hasParameterDataValue => predefined string("low", "high", etc)

* **Predicting** (<http://etna.istc.cnr.it/framester2/data/framestercore/Predicting>)

A Speaker states or makes known a future Eventuality on the basis of some Evidence. The Weather Centre predicted that it would be warmer but wet for the weekend. The OECD forecast that UK interest rates would be 13 per cent by the end of 1989. Another seer who forecast a Tory majority -- without compromising his impartiality -- was Sir Robin Day. The European market is forecast to grow 18.1% by the end of next fiscal year.

This frame in our case models the activity of predicting the decisions.

fs:Predicting => cbi:affectedBy = > cbi:State

fs:Predicting => isAbout => fs:Deciding

fs:Predicting => reaction:isPerformedBy => cbi:BiasedAgent

* **Deciding** (<http://etna.istc.cnr.it/framester2/data/framestercore/Deciding>)

We used this frame to model activity of taking decision.

fs:Deciding => reaction:isPerformedBy => cbi:BiasedAgent

fs:Deciding => reaction:isPerformedBy => cbi:NonBiasedAgent

**Ontology Design Patterns**

We used this pattern to model the bias.

* **Classification** (<http://ontologydesignpatterns.org/wiki/Submissions:Classification>)

To represent the relations between concepts (roles, task, parameters) and entities (person, events, values), which concepts can be assigned to. To formalize the application (e.g. tagging) of informal knowledge organization systems such as lexica, thesauri, subject directories, folksonomies, etc., where concepts are first-order elements.

* **Reaction** (<http://ontologydesignpatterns.org/wiki/Submissions:Reaction>)

To model dynamic situations, tracking agents and actions they produce, events that are results of some action(s), and consequences as new actions, i.e. reactions.

* + **Object with states** (<http://ontologydesignpatterns.org/wiki/Submissions:Object_with_states>)

An object can have different states for which different restrictions apply. The goal of the pattern is to allow modelling the different states of an object and the restrictions on such object for its different states.

**Entities and properties from other resources**

**Recommender System Context ontology**

* + **rsctx:EmotionalState** (<https://softeng.polito.it/rsctx/>)

The state of a person's emotions (especially with regard to pleasure or dejection). Has type which is a predefined sting. In our case: "positive" and "negative"or other predefined values.

**CIDOC Conceptual Reference Model**

* **crm:has type** (domain: EmotionalState, range: predefined string like "happy", "sad", etc)

(<https://cidoc-crm.org/html/cidoc_crm_v7.1.3.html#P2>)

This property allows sub-typing of entities – a form of specialization – through the use of a terminological hierarchy, or thesaurus.

* **crm:isAbout** (<https://cidoc-crm.org/html/cidoc_crm_v7.1.3.html#P129>)

This property documents that an instance of E89 Propositional Object has as subject an instance of E1 CRM Entity. This differs from P67 refers to (is referred to by), which refers to an instance of E1 CRM Entity, in that it describes the primary subject or subjects of an instance of E89 Propositional Object.

**Bibliography**

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