**Baader-Meinhof Phenomenon Bias**

**Bias Definition**

The Baader-Meinhof phenomenon, also known as the Frequency Illusion, is a cognitive bias in which after noticing something for the first time, there is a tendency to notice it more frequently thereafter, leading one to believe that it has an increased frequency of occurrence. This perception is not due to the actual increase in frequency but rather due to the new awareness of the item, event, or term.

In essence, while the Baader-Meinhof Phenomenon often refers to more distinctive or unusual observations, the frequency illusion can apply to any information, whether common or rare. Both terms describe the same underlying cognitive bias of increased awareness and selective attention, but the Baader-Meinhof Phenomenon has a flavor of novelty and rarity attached to it.

**Ten scenarios of Baader-Meinhof Phenomenon**

1. **New Word.** You learn a new word, "solipsism," in a philosophy class. Over the next few days, you encounter it in a book, hear it in a podcast, and see it referenced in a news article. It feels like the word is appearing everywhere, though it's just your newfound awareness of it.
2. **Car Purchase.** After researching and buying a new car, a specific model you had never noticed before, you start seeing the same model on the road frequently. Every street and parking lot seems to have a few, making you wonder if there was a sudden surge in popularity.
3. **Fashion Trend.** You buy a pair of boots that seemed unique, and suddenly, you notice them everywhere. People in cafes, at work, and on public transport all seem to be wearing the same style, though you had never noticed this trend before your purchase.
4. **Health Symptom.** After experiencing a rare symptom and reading about it, you start hearing others talk about similar symptoms and see it mentioned in health forums and TV shows. This makes you feel like the issue is much more common than you initially thought.
5. **New Gadget.** You read about a new tech gadget, and suddenly, you see it being used in public, reviewed on tech sites, and featured in YouTube tutorials. It appears to have gained popularity overnight, but it's your awareness that has changed.
6. **Exercise Routine.** You start a new workout routine, like Pilates, and suddenly notice many people talking about Pilates, see ads for classes, and find articles about its benefits. This makes you think its popularity has exploded just as you started.
7. **Historical Figure.** You learn about a historical figure for the first time in a documentary and then notice references to this person in books, movies, and discussions soon after. It seems as if everyone has this figure on their mind.
8. **Investment Topic.** After considering investing in a specific stock or cryptocurrency, you start noticing it mentioned in news headlines, financial podcasts, and conversations with friends, making you think it's a sign to proceed.
9. **Cooking Ingredient.** You discover a new spice or ingredient in a cooking class and then start seeing recipes that use it everywhere: cooking shows, magazines, and social media. It feels like everyone suddenly discovered this ingredient.
10. **Plant Variety.** You buy a specific type of houseplant, and suddenly, you see it everywhere: in office buildings, friends’ homes, and in social media posts about plant care. It feels like this plant variety has become a trend overnight.

**User Story for the scenario "New Word"**

After learning the word "solipsism" in a philosophy class, Jamie began to encounter it everywhere: in a psychology book, during a podcast, and even in a news article about perception. This amusing frequency of a once unfamiliar term led Jamie to appreciate how new knowledge can suddenly resonate across different mediums, enhancing awareness and deepening their engagement with ongoing learning.

**Competency questions**

**Classes and properties**

Version of Ontology builder from the Chat GPT

Classes:

1. **Concept**
   * Represents any concept, word, idea, or object that can be noticed by an individual.
2. **Individual**
   * Represents a person who experiences the Baader-Meinhof Phenomenon.
3. **Occurrence**
   * An instance where the individual notices the concept in a particular setting.
4. **Media**
   * Different mediums through which the concept is encountered (e.g., book, podcast, article).
5. **LearningEvent**
   * An event where the individual first learns or notices the concept.

Properties:

1. **notices** (domain: Individual, range: Occurrence)
   * Represents an individual noticing the concept.
2. **appearsIn** (domain: Concept, range: Media)
   * Indicates the medium in which the concept appears.
3. **learns** (domain: Individual, range: LearningEvent)
   * Connects an individual with the event of first learning or noticing the concept.
4. **occursDuring** (domain: Occurrence, range: Media)
   * Connects an occurrence to the specific media in which it was noticed.
5. **hasConcept** (domain: Occurrence, range: Concept)
   * Links an occurrence to the concept that was noticed.
6. **hasTimestamp** (domain: Occurrence, LearningEvent, value: DateTime)
   * Records the time when the concept was noticed or learned.
7. **hasFrequency** (domain: Concept, value: Integer)
   * Indicates the number of times the concept has been noticed within a certain timeframe.
8. **hasDescription** (domain: Concept, Media, value: Text)
   * Provides a description of the concept or the media type.

Our Changes

Classes:

1. **BiasedAgent**

* Represents an entity that experiences the bias.

1. **Baader-MeinhofPhenomenon**
   * + Represents another type of the cognitive bias - Baader-MeinhofPhenomenon - a cognitive bias wherein after noticing something for the first time, there is a tendency to notice it more often, leading someone to believe that it has an increased frequency of occurrence. This is not due to the actual increase in frequency but rather due to the individual's selective attention and heightened awareness. Some sources call it also Frequency Illusion.
2. **CognitiveBias** 
   * A general class representing cognitive biases.
3. **FrequencyIllusion**

* A cognitive bias where a person believes a recently noticed item or concept has suddenly become prevalent.

Properties:

1. **affectedBy** (domain: BiasedAgent, range: Baader-MeinhofPhenomenon OR domain: Belief, range: PerceptionExperience)
   * + indicates the influence of the cognitive bias to the individual whose perception is influenced by or belief which is influenced by the perception experience.

**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

* + - **Belief** (<http://etna.istc.cnr.it/framesterpage/data/framestersyn/Belief.n.1>)

A belief is a mental state or attitude where an individual holds something to be true or probable. Beliefs can range from factual assertions about the world to subjective evaluations, opinions, or attitudes about various matters. Beliefs can be based on evidence, personal experience, cultural upbringing, social influences, or even intuition.

Неre we used it to show that the BiasedAgent has the biased opinion (belief) to express that it is only opinion but not the real state of things.

cbi:BiasedAgent => cco:belief=>fsyn: Belief

fsyn:Belief => cbi:affectedBy => fs:PerceptionExperience

fsyn:Belief => crm:isAbout => fs:Frequency

* + - **Frequency** (<https://w3id.org/framester/data/framestercore/Frequency>)

This frame has to do with the repetition (and especially the frequency of repetition) of an event. Many of the adjectives and adverbs in this frame are based on nouns in the Calendric\_unit frame. China will have to face a high frequency of sand storms in the years to come.

In our case, this frame presents the frequency of perception experience of a particular concept, which seem to happen more often under the influence of bias.

fsyn:Belief => crm:isAbout => fs:Frequency

fs:Frequency => parameter:isParameterFor => fs:PerceptionExperience

fs:Frequency => parameter:hasParameterDataValue => predefined string ("hign")

* + **Becoming Aware** (<http://etna.istc.cnr.it/framester2/data/framestercore/BecomingAware>)

Words in this frame have to do with a Cognizer adding some Phenomenon to their model of the world. They are similar to Coming-to-believe words, except the latter generally involve reasoning from Evidence. The words in this frame take direct objects that denote entities in the world, and indicate awareness of those entities, without necessarily giving any information about the content of the Cognizer's belief or knowledge. These words also resemble perception words, since creatures often become aware of things by perceiving them.

This frame helps us to model the process of learning new things and concepts.

cbi:BiasedAgent => exob:isEngagedIn => fs:BecomingAware

fs:BecomingAware => reaction:hasOutcome => dbo:Knowledge

fs:BecomingAware => sequence:precedes => fs:PerceptionExperience

* + **Perception Experience** (<http://etna.istc.cnr.it/framester2/data/framestercore/PerceptionExperience>)

This frame contains perception words whose Perceivers have perceptual experiences that they do not necessarily intend to. For this reason we call the Perceiver role Perceiver\_passive. Comparing the Perception\_experience frame to the Perception\_active frame, we note that for some modalities there are different lexical items in each frame. For instance, whereas Perception\_experience has see, Perception\_active has look at. For other sense modalities, we find the same lexical items in both frames. To illustrate, consider the verb smell where I smell something rotten exemplifies its Perception\_experience use and Smell this to see if it's fresh exemplifies its Perception\_active sense. This frame also includes words which are not specific to any sense modality, including detect, perceive, perception, sense.

We use the frame to model the activity of perception of the concept.

fs:PerceptionExperience => parameter:hasParameter => fs:Frequency

fs:PerceptionExperience => situation:isSettingFor => dbo:Concept

fsyn:Belief => cbi:affectedBy => fs:PerceptionExperience

**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.

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

To represent contexts or situations, and the things that are contextualized.

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

To represent sequence schemas. It defines the notion of transitive and intransitive precedence and their inverses. It can then be used between tasks, processes, time intervals, spatially locate objects, situations, etc.

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

To represent parameters to be used for a certain concept.

* **Experience and Observation** (<http://ontologydesignpatterns.org/wiki/Submissions:Experience_%26_Observation>)

To represent the epistemological "missing link" between a cognitive activity, e.g. the interaction with a cultural object, and any evidence of the effects this activity has on the individuals that are engaged with it; what can collectively be considered as an experience.

**Entities and properties from other resources**

**Dbpedia**

* **dbo:Knowledge** (<https://dbpedia.org/page/Knowledge>)

Can be defined as awareness of facts or as practical skills and may also refer to familiarity with objects or situations. Knowledge of facts, also called propositional knowledge, is often defined as true belief that is distinct from opinion or guesswork by virtue of justification. While there is wide agreement among philosophers that propositional knowledge is a form of true belief, many controversies in philosophy focus on justification: whether it is needed at all, how to understand it, and whether something else besides it is needed. These controversies intensified due to a series of thought experiments by Edmund Gettier and have provoked various alternative definitions. Some of them deny that justification is necessary and replace it, for example, with reliability or the man.

* **dbo:Concept** (<https://dbpedia.org/page/Concept>)

Concepts are defined as abstract ideas. They are understood to be the fundamental building blocks of the concept behind principles, thoughts and beliefs.They play an important role in all aspects of cognition. As such, concepts are studied by several disciplines, such as linguistics, psychology, and philosophy, and these disciplines are interested in the logical and psychological structure of concepts, and how they are put together to form thoughts and sentences. The study of concepts has served as an important flagship of an emerging interdisciplinary approach called cognitive science.

**SKOS Simple Knowledge Organization System**

* **skos:related** <https://www.w3.org/2009/08/skos-reference/skos.html#related>

Property which asserts an associative link between two concepts.

**CIDOC Conceptual Reference Model**

* **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.

**The Cognitive Characteristics Ontology 0.2**

* **cco:belief** (<https://smiy.sourceforge.net/cco/spec/cognitivecharacteristics.html>)

Property which means that a person has belief - an uncertain relation for competence representation. That means beliefs, persuasions or opinions, which can also be misconceptions.

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