**Frequency Illusion Bias**

**Bias Definition**

The Frequency Illusion, also known as the Baader-Meinhof phenomenon, is a cognitive bias which describes a situation where something you've recently noticed, experienced, or been told about, suddenly seems to occur with a surprising frequency. Once your attention is drawn to a particular item or concept, you start noticing it everywhere, creating the illusion that its frequency has increased. This bias does not actually involve an increase in the occurrence of the item or concept but is rather due to your heightened awareness and sensitivity to it.

Connected with Confirmation bias. But Confirmation bias is about how we seek, interpret, and remember information in ways that confirm what we already believe. The Frequency Illusion is about perceiving an increase in the frequency of something we've recently noticed.

**Ten scenarios of Frequency Illusion Bias**

1. **Song Frequency.** You discover a new song and become obsessed with it. Suddenly, you hear it playing everywhere: in stores, on the radio, and in public places, as if it’s on repeat across the city. This heightened awareness makes you feel like the song is following you.
2. **New Car Color.** After deciding to buy a new car in a unique shade of blue, you start to notice cars of the same color all over the roads. It seems like every other vehicle shares your choice, whereas you hadn't noticed this color being popular before making your decision.
3. **Fashion Trends.** You buy a new jacket that you think is quite unique. However, over the next few days, you start seeing people everywhere wearing similar styles. Your recent purchase makes you more sensitive to noticing these jackets, creating the illusion that everyone suddenly has the same fashion sense.
4. **Tech Gadgets.** After you buy the latest smartphone model, it suddenly seems like everyone around you has the same model. You notice people using it on the bus, in cafes, and at work, whereas before it seemed less common.
5. **Health Symptoms.** After experiencing a specific health symptom and researching it online, you begin to notice many articles, ads, and discussions about the same symptom. This makes you feel like there's a sudden spike in awareness, though it’s really your perception that has changed.
6. **Exercise Routine.** You start a new workout regimen, and suddenly it seems like everyone is talking about the same exercises. You see videos, articles, and social media posts about it everywhere, making it seem more popular than ever.
7. **Baby Names.** You and your partner settle on a name for your upcoming baby. Suddenly, it seems like every other child you hear about has the same name, and you notice the name popping up in credits of movies, books, and on name tags.
8. **Unique Hobby.** You take up a hobby like pottery. Suddenly, you start noticing pottery classes, workshops, and handmade pottery for sale everywhere you go. Before your interest, you hadn't realized how widespread it was.
9. **Book Titles.** After reading a book with a peculiar title, you start noticing the title or similar themes in many other places — bookstores, libraries, and mentioned in conversations. It feels like everyone is suddenly interested in this book.
10. **Historical Events.** You watch a documentary about a historical event, and afterwards, it seems like references to that event are everywhere: in newspaper articles, TV shows, and social media. What felt like a niche interest is suddenly a common topic of discussion.

**User Story for the scenario "Song Frequency"**

On a bright morning, Alex discovers a captivating song while exploring a music app. The melody, full of life, instantly lifts their spirits. As the day unfolds, Alex hears the song everywhere: in a cafe, from a street performer, and across social media, making it seem as if the song has become a personal soundtrack to their day.

Reflecting on this serendipity, Alex realizes the joy in discovering beauty where least expected. The song, initially just another track, transforms the ordinary into something magical, highlighting the wonders that attention to detail can reveal. Grateful for the day's harmony, Alex appreciates how a single tune can illuminate the richness of everyday life, turning the mundane into the extraordinary with just a change in perspective.

**Competency questions**

1. **How does the Frequency Illusion manifest in Alex’s experience of hearing the song multiple times during the day?**

The Frequency Illusion manifests as Alex hearing the song in various environments such as a cafe, from a street performer, and across social media, making it seem more prevalent.

1. **What observations can be recorded to measure the frequency of the song's occurrence in different environments?**

Observations can be recorded in environments like cafes and social media, with parameters such as the number of times the song is heard and the duration of exposure.

**Classes and properties**

Version of Ontology builder from the Chat GPT

Classes:

1. **Frequency Illusion:** A cognitive bias where a person believes a recently noticed item or concept has suddenly become prevalent.
2. **Stimulus:** An event, item, or concept that triggers the Frequency Illusion.
3. **Perception:** The process of becoming aware of something through the senses, influenced by attention.
4. **Selective Attention:** The cognitive process of focusing on a particular object or event for a period of time while ignoring irrelevant information.
5. **Cognitive Bias:** Represents the overarching concept of cognitive biases.
6. **Individual:** The person experiencing the Frequency Illusion.
7. **Environment:** The surroundings or conditions in which the Individual operates, noticing the Stimulus.

Properties:

1. **experiences** (domain: Individual, range: Frequency Illusion): Links an individual to the experience of Frequency Illusion.
2. **focusesOn** (domain: Individual, range: Stimulus): Denotes what the individual pays attention to.
3. **influences** (domain: Selective Attention, range: Perception): Shows how selective attention influences perception.
4. **occursIn** (domain: Frequency Illusion, range: Environment): Indicates where the Frequency Illusion takes place.
5. **triggers** (domain: Stimulus, range: Frequency Illusion): Connects a stimulus with the triggering of Frequency Illusion.

Our Changes

Classes:

1. **BiasedAgent**

* Represents an entity that experiences the bias.

1. **ConfirmationBias**
   * Represents another type of the cognitive bias - Confirmation Bias, which is a type of cognitive bias that involves favoring information that confirms one’s preexisting beliefs or hypotheses. Individuals exhibiting this bias are more likely to seek out, interpret, remember, and share information in a way that confirms their preconceptions. Frequency Illusion and Confirmation Bias are connected according to the description.
2. **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.

Properties:

1. **affectedBy** (domain: BiasedAgent, range: Frequency Illusion OR domain: Belief, range: Situation)

* 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

* + - **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 => situation:Situation

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 observations, which seem to happen more often under the influence of bias.

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

fs:Frequency => parameter:isParameterFor => situation:Situation

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

**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.

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

The intent of this pattern is to represent observations of things, under a set of parameters. Common parameters may be the time and place of the observation, but may be any feature that is observed concerning the specific thing being observed.

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

To represent parameters to be used for a certain concept.

**Entities and properties from other resources**

**OWL Web Ontology Language**

* **owl:Thing** (<https://www.w3.org/TR/2004/REC-owl-semantics-20040210/syntax.html#owl_Thing_syntax>)

Refers to the top concept in the Web Ontology Language (OWL), which is part of the Semantic Web standards provided by the World Wide Web Consortium (W3C). Is the superclass of all classes; every class in an OWL ontology is either explicitly or implicitly a subclass of "owl:Thing".

**SKOS Simple Knowledge Organization System**

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

Property which a sserts an associative link between two concepts. We specially used this property but not the sameAs because we tryed to model Frequency Illusion and Baader-Meinhof Phenomenon as differemt notions. But basing on some sources they coud be modelled like this:

Frequency Illusion => sameAs => Baader-Meinhof Phenomenon

**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.

**Bibliography**

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