

## SciFeye Index Version 0.0 Companion

The SciFeye Index and Companion are under constant revision to be as clear, efficient, and useful as possible to the reviewing team as well as the general public. If you have any comments, questions, concerns, or suggestions, please do not hesitate to make it known.

The SciFeye Index Version 0.0 Companion contains proposed changes for the next version of the SciFeye Index (Version 0.1).

The companion's criteria and examples are partly taken or adapted from the [Credibility Coalition](#), the [W3C Editor's Draft of Credibility Signals](#), and the following [publication](#):

Amy Zhang, Aditya Ranganathan, Sarah Emlen Metz, Scott Appling, Connie Moon Sehat, Norman Gilmore, Nick B. Adams, Emmanuel Vincent, Jennifer 8. Lee, Martin Robbins, Ed Bice, Sandro Hawke, and David Karger. A Structured Response to Misinformation: Defining and Annotating Credibility Indicators in News Articles. The Web Conference, April 2018.

## Accuracy

### Section I: Title

#### 1) Clickbait Title

A title that is designed to entice users to open the link and view the article. Can be used in a way to make misleading or false statements to simply get more clicks. These titles tend to catch the eye and are commonly used to build suspense and sensation, often at the expense of credible reporting.

##### a) Listicle

Title uses a list as a structure, to attract attention. Usually includes a number followed by brief text.

e.g. "Top 10 Ways To..."

##### b) Cliffhanger

Title ends with suspense to attract interest.

e.g. "He Changed His Life After His Wife Told Him This"

##### c) Curiosity Gap

Title advertises a hidden secret or trick to attract interest.

e.g. "Doctors Hate Her After Learning About This One Easy Trick"

##### d) Provokes Emotions

Title plays on the emotions of users to attract interest. Focus on emotional terminology.

e.g. "...Revolting Behaviour...", "...Will Leave You in Tears...", "...Absolutely Shocking..."

##### e) Challenges Ego

Title includes a statement that calls in the users own ego into question. Focus on exclusion of certain people as “they wouldn’t or can’t get it”.

e.g. “Only Real Football Fans Would Understand This”

f) Defies Convention

Title includes a statement that goes against current widespread views.

e.g. “Will Your Pets Decrease Your Life Span?”, “Does Broccoli Give You Cancer?”

g) Induces Fear

Title plays on the fear of the users into attracting interest.

e.g. “Is Your Significant Other Cheating On You?”

## 2) Representativeness

Is the title representative of what is going on in the original research article? Advertising one statement and reporting another is not acceptable journalism and is used to attract interest.

a) Title takes a different stance from research article

Title conveys a different claim or completely the opposite from what is being said in the research article. This indicates that the title was designed to attract attention, or the piece is opinion based but masquerading as news.

e.g. Article claims coffee is good for you, but the title states how you should not be drinking coffee.

b) Title emphasizes a minor point from the research article

Title conveys a relatively minor point from the research article, often taking it out of context or blowing it out of proportion.

e.g. Article claims a new viral delivery method can help cancer treatment but in one sentence also mentions the risk that it may not work in people over 60. Title claims new treatment is made to exclude older folk.

c) Title contains little information regarding research article

Title is uninformative and just is designed to attract interest.

e.g. “New study done on cancer research” says nothing about the research article.

d) Title overstates claims made in research article

Title exaggerates claims or statements made in the research article to attract interest.

e.g. Article is about CRISPR editing that restored gene function in a mouse model. Title states the cure to cancer is found.

e) Title understates claims made in research article

Title minimizes the claims or statements made in the research article. This is often done to undermine opposing viewpoints to the author of the news story or the news agency.

e.g. Article states that a new treatment discovered significantly improves the lifespan of afflicted patients. Title mentions that the afflicted patients still do not have a long life.

## **Section II: Objectiveness**

### **3) Personal Opinion**

Author injects their personal opinion into the news story. This is no longer news reporting but rather an opinion piece. This is especially dangerous if this opinion is not in a clearly described opinion piece but is rather included in a news story and disguised as news or fact.

#### **a) Author's personal opinion is mentioned justifiably**

This is fine if the author is directly impacted in this and doesn't state any viewpoints that would affect a reader's opinion.

e.g. "As someone with Type 2 Diabetes I was interested when I read...[insert article about type 2 diabetes]..."

#### **b) Author's personal opinion is mentioned unjustifiably**

This is not okay; an opinion is masqueraded as fact or is injected to stir up emotions or challenge the validity of what is being reported.

e.g. Article is about vaccines saving the lives of children in a developing country. Author writes "but should we consider what kind of chemicals we are putting into our bodies? When my children were born..."

### **4) Multiple Perspectives**

If a news story is reporting a topic and does not include multiple viewpoints it may be promoting a certain result. Fair, unbiased reporting includes all credible viewpoints when reporting a scientific discovery, paper, or topic.

#### **a) Multiple perspectives were provided**

News story includes multiple perspectives from either other papers or other credible sources such as leaders in the field.

e.g. New artificial intelligence for predicting trends in the stock market is created. News story also includes quotes from a leader in the field who contests that while this discovery is promising, the stock market is unpredictable.

#### **b) Precedence given justifiably to a perspective/ Precedence is not given justifiably**

News story provides multiple perspectives. Some perspectives are more credible than others and are treated as such.

e.g. News story mentions a new vaccine is developed. News story mentions how some are opposed to vaccines but includes sources saying that vaccines are good and do not exhibit the serious health risks claimed by opposition.

c) Precedence given unjustifiably to a perspective/ Precedence is not given unjustifiably

News story provides multiple perspectives. Some perspectives are less credible than others but are given more focus.

e.g. News story mentions a new vaccine is developed. News story mentions how those opposed to vaccines claim they cause autism due to the presence of certain chemicals. The cited source is a paper in a predatory journal (extremely low impact factor or is not peer-reviewed) or has been debunked.

### **Section III: Research Article Claims and Statements**

#### **5) Adequately Describes Intent**

Scientific research is done with an intent in mind. Without accurate context for why the research was conducted or was carried out with a goal in mind, results, claims, and statements can be misunderstood. This can be done in a misleading way and may spread misinformation without proper context.

a) News story mentions article intent

News story mentions the intent of the original research article.

e.g. News story indicates that the researchers were trying to find a way to deliver medicine into cells via a virus as there was no other way to deliver the drug.

b) News story does not mention article intent

News story does not mention the article intent.

e.g. News story mentions CRISPR protein was injected into a nine-year-old boy, but fails to mention this was done to treat an otherwise incurable disease.

c) News story correctly describes article intent

News story not only mentions article intent but states it in a factually current manner.

e.g. News story correctly states that the viral delivery for the drug was done as there were no other options currently available.

d) News story incorrectly describes article intent (over/understatement)

News story mentions the article intent but incorrectly states it.

e.g. News story mentions CRISPR protein was injected into a nine-year-old boy but states this is because scientists were wanting to test CRISPR in humans.

#### **6) Adequately Describes Results and Claims**

Straightforward. If a news story is reporting a scientific discovery, paper, or topic it should accurately describe results and claims. Anything else is spreading false information or misinformation, potentially with nefarious intent in mind.

a) News story mentions article results and or claims

The news story mentions some results and or claims that are included within the original research article.

e.g. News story states that a new drug treatment increased the lifespan of a patient, as indicated in the research article which states the new drug treatment increased the average lifespan of those inflicted with a disease by 5 years.

c) News story correctly describes article results and or claims

The news story mentions some results and or claims from within the original research article in a factually correct manner.

e.g. News story states that a new drug treatment increased the lifespan of a patient, as indicated in the research article which states the new drug treatment increased the average lifespan of those inflicted with a disease by 5 years.

d) News story incorrectly describes article results and or claims (Over/understatement)

The news story states some results and or claims from within the original research article incorrectly. This can be false information (story says one thing, article says the opposite), or can be an over- or understatement from what is in the article.

e.g. News story states that a new drug treatment essentially erases the disease of a patient, however, the research article simply mentions the new drug treatment increased the average lifespan of those inflicted with the disease by 5 years.

## 7) Article Reputation

Accurate reporting is one thing, but reporting of shady or skeptical research is nothing short of spreading false statements or misinformation.

a) Research article is from a reputable journal or source

You can look up the original research article and find the journal it is from. You are able to see if the journal is peer-reviewed (good) and if the impact factor is higher than (0.3). Journals with an impact factor of lower than 0.3 tend to be predatory, and publish anything, regardless of quality. Impact factor alone is suggestive but not everything, you can determine on your own if the article or source is of quality. Other sources, such as experts in the field, who are accepted or renowned as experts in the field not just a random individual with a degree in the field are reputable.

e.g. News story is reporting on a research article which is published in the journal Nature (Impact Factor ~40).

b) Research article is not from a reputable journal or source

Journals with an impact factor of lower than 0.3 tend to be predatory, and publish anything, regardless of quality. Impact factor alone is suggestive but not everything. Sources which are not peer-reviewed, or from “experts” who do not do related research, or have a credible knowledge set are not reputable.

e.g. News story reports on a research article which claims CRISPR is helping create cold-tolerant crops. Story contains a source of whether or not this is viable from a priest.

#### **Section IV: News Story Claims and Statements**

##### **8) Sources**

News stories tend not to just report on one scientific source but rather multiple to provide a whole story. Without multiple sources, the quality and credibility of the claims and statements made are questionable or plagiarized.

###### **a) Independent sources are used**

Multiple independent sources that are not just the original research article provide a credible telling of the news story and its claims and statements.

e.g. News story includes two other experts who did not write the research article in question.

###### **b) Independent sources are not used**

Without independent sources, the story may be biased, leaving out critical viewpoints, spreading misinformation, or plagiarizing.

e.g. News story makes a claim not in the original research article but does not provide a source.

###### **c) Only sources from within the research article are used**

Multiple independent sources are used but without outside sources, the reporting may be biased toward a particular viewpoint.

e.g. News story cites references that are only used from the research article’s references section.

**[\*\*error in SciFeye Index version 0.0, under “News Story Claims and Statements, 8) Sources”, the same statement but in different words, this will be updated in SciFeye Index version 0.1\*\*]**

###### **d) Source(s) are from outside research article**

Some or all sources are not cited by the original research article. Provides a balance in the reporting.

e.g. News story cites an expert who is not included in the research article or cited by the research article for a statement made.

##### **9) Claims**

During news reporting, in some articles there may be instances of claims made by the author of the news story that are not found within the research article, or may incorrectly jump to conclusions for phrasing, or may use a wording that is not congruent with the research article. These cases, without proper sourcing, can be a form of misinformation or opinion masquerading as fact.

a) News story provides unjustifiable critiques

News story contains a critique made by the author or quoted by the author that is not sourced or credible. This undermines the research that is being reported.

e.g. Research creates a new algorithm for predicting trends in the stock market. The news story makes a critique saying how can computer scientists ever understand the intricacies of the stock market.

b) News story states what is known

It is important that a news story will mention what is currently known about the research conducted. This will help clear up any misconceptions reader's have when reading the news story.

e.g. Research article claims they know that a treatment is alleviating the symptoms of a disease but do not know other impacts to the rest of the body or any off-target effects. News story conveys both of these in an accurate manner explaining what is known and unknown regarding the research.

d) News story states what is unknown

The researchers do not know everything. Reporting suggesting otherwise is misleading, aspects that are unknown regarding the research are important for the public to know.

e.g. Research article claims they know that a treatment is alleviating the symptoms of a disease but do not know other impacts to the rest of the body or any off-target effects. News story conveys both of these in an accurate manner explaining what is known and unknown regarding the research.

f) News story contains gaps or leaps in reasoning

This occurs when news stories try to put claims or results from the scientific research into their own words or try to predict what could come from the research. We must be careful in not jumping to conclusions as this can lead to a slippery slope of misconceptions regarding the reality of the research.

e.g. Research article claims CRISPR study was able to edit a gene related to Alzheimer's in mice. News story claims success of this method in humans is imminent.

g) News story contains false claims

This is not ethical reporting. False claims can be spread to slander the research and will misconstrue the public's opinion in one direction or another.

e.g. News story reports that climate change is a myth based on a new study. The article the news report is based on explicitly states that rises in global temperature are caused by manmade activities.

h) News story contains misleading claims

Also, not ethical reporting. Although as bad as false claims, misleading claims are slants or skews to statements that were made in the original research article to give a perceived notion of credibility to any claims or statements a news story is looking to make.

e.g. News story claims the cure to cancer has been found. Research article they are reporting only mentions a new cancer-causing gene mutation was discovered.

i) News story contains casual unsourced claims

Casual unsourced claims are essentially opinions of the author with usually no credibility whatsoever. These are made to disguise opinions as facts when taken at face value.

e.g. News story claims that injecting yourself with CRISPR in your garage to edit your genome is the next big thing. Nowhere can any source be found for this.

## 10) Context

Without proper context, words, quotations, results, claims or statements can be used to promote a narrative, mislead readers into thinking one thing over another, or for shock and entertainment value without the whole story.

a) News story provides appropriate context for article claims and statements

News story does not take anything out of context, and provides a detailed, accurate telling of any claims and statements.

b) News story overstates an article result

News story takes an article result, claim or statement, out of context in a way that overstates its importance.

e.g. News story states that a new treatment has cured Alzheimer's but neglects to mention that the research article has just shown that the new treatment has helped reduce Alzheimer's symptoms in mice.

c) News story understates an article result

News story takes an article result, claim or statement out of context in a way that undercuts its importance.

e.g. News story states that a new vaccine has been made for Ebola but requires significantly more testing before it will be useful. Research article has shown proof that the vaccine has worked in extended human testing and will roll out soon.

d) News story oversimplifies an article result

News story takes an article result, claim, or statement out of context in a way that oversimplifies the process, or glosses over the details, which may mislead the reader.

e.g. News story states that adding CRISPR to the bloodstream can cure Cystic Fibrosis (a genetic disorder). Research article actually says not all forms of Cystic Fibrosis are caused by the same genetic reason, and significant testing of various different conditions need to be done to treat Cystic Fibrosis symptoms.

e) News story “under simplifies” an article result

News story takes an article result, claim, or statement out of context in way that makes it seem so complicated that the general viewer would not be able to understand.

e.g. News story spews out all the variables and specifications of a brand-new telescope and how it is being used to view [insert long scientific complicated words here]. News story states it in such a way that cannot be understood by the general reader, when it could have been explained how the telescope is being used to view a certain type of light we couldn't view before.

**[\*\*there will be an edit to 10e) to change “News story under simplifies an article result” to “News story overcomplicates an article result” in SciFeye Index version 0.1\*\*]**

## 11) Correlation vs Causation

Just because two things tend to be found together does not mean one thing causes another. This is a major source of confusion and misinformation in the reporting of studies, that promote definitive conclusions based on data that is just correlated with itself not that it is suggestive or proof of causation.

a) News story confuses correlation and causation

News story reports that a correlation from the research article (e.g. everyone who drinks water dies) is actually a cause (e.g. drinking water causes death). The opposite is also true. If a research article is saying that something causes another (e.g. vaping is causing this health effect), the news story cannot say that something is just observed or commonly found with something (e.g. cannot say the health effect just tends to be noticed or observed in people who vape, as opposed to being definitively proven).

## 12) Cherry Picking

News stories cannot simply choose the results that they see fit for a news story. If the research article is reporting that something worked but with side effects, the news story cannot report the positive results without mention of drawbacks.

a) News story cherry picks results for a narrative

News story only contains positive or negative claims or statements made by the research article without providing a balanced unbiased account of the research. News story neglects to mention any big “ifs” or “buts” made by the original research article.

## Section V: Logical Fallacies

### 13) Common Logical Fallacies

These are errors or biases in logic and reasoning which prevent or skew our understanding.

a) News story contains the straw man fallacy

News story misrepresents a research article's claim to make it easier to argue against.

e.g. Research article makes a claim that a new ancient human species has been discovered. News story restates the claim as the researcher's saying humans evolved from bumbling monkeys and how it is impossible. This is a misrepresentation.

b) News story contains the false dilemma fallacy

News story presents a choice or options as if there are only two options. This creates forces a dilemma that is not accurate in reality.

e.g. Research article claims high levels on alcohol intake are correlated with an increase in cancer rates. News story presents this as "you mean we either don't drink wine at all or we die of cancer?"

c) News story contains the slippery slope fallacy

News story indicates that one small change will lead to major changes.

e.g. Research article states that concussions are correlated with health effects later in life. News story states that since concussions are bad that sports should include rules regarding concussions, but this will destroy the competitiveness of sports.

d) News story contains the appeal to fear fallacy

News story exaggerates the risks and dangers of an issue or uses scare tactics to change a user's view.

e.g. Research article claims a new vaccine is made, but some people may be allergic. News story claims that all vaccines have a high risk of killing you due to extreme allergic reactions.

e) News story contains the naturalistic fallacy

News story claims that because something is more natural, it must be better for you.

e.g. Research article shows how chemotherapy is effective at treating this type of brain cancer. News story claims that simply eating more antioxidant rich foods will be more effective than treating your body with chemicals.

## **Section VI: Author**

### 14) Conflict of Interest

If the author has a conflict of interest this may alter the way they are choosing their word choice, which facts to present, and which sources to use, which may lead to biases in reporting.

a) Author has a conflict of interest

Author has written numerous articles promoting or disagreeing with the research that is of subject in the news story.

e.g. Research article is talking about the benefits of artificial intelligence in species conservation efforts. The author has written numerous articles about how artificial intelligence should be outright banned.

b) Author does not have an obvious conflict of interest

No conflicts of interest could be found.

c) Author states a conflict of interest but remains neutral

Yes, the author has a conflict of interest, but has stated their viewpoints. The remainder of the article presents a fair and unbiased outlook to the research article at hand.

#### 15) Personal Opinion

**[\*\*this section has been revised to only be counted once in “Section II: Objectiveness, 3) Personal Opinion.” This will be corrected in SciFeye Index version 0.1\*\*]**

#### **Section VII: Reporting**

#### 16) Represents Scientific Literature

Scientific literature is a long, drawn out process including proper experimentation and peer-review to validate, verify, and ensure data that is being reported is credible.

a) Reporting accurately represents scientific literature

News reporting does not undermine the peer-review process, does not undermine the use of experimental controls, and shows respect to the rules and guidelines that govern scientific research.

b) Reporting does not accurately represent scientific literature

News reporting complains about the need for more testing, the lack of certainty, or any statements made by the researchers which indicate that more work needs to be done.

#### 17) Represents Scientific Process

The scientific process is a long, drawn out set of guidelines and rules to ensure what is being reported is credible, verified, able to be replicated, and is not the result of factors other than what is being tested. News stories that gloss over this process are undermining the value of the scientific process.

a) Reporting accurately represents the scientific process

News story does not gloss over or complain about the checks and balances or cost of a new scientific discovery, paper, or topic.

b) Reporting does not accurately represent the scientific process

News story glosses over minor findings, the results of any control experiments, or the fact that results have been found that may say otherwise, but a result is chosen and reported regardless over other findings in the research article.

#### 18) Advertising and Marketing

News story is not actually a descriptive, accurate, unbiased telling of a scientific discovery, paper, or topic but rather is trying to sell a product or service. This is in fact biased and may be using the story as a way to mislead or get reader's thinking in a way that would be beneficial to their product.

a) Reporting is advertising or marketing a product or service

News story is reporting a topic, then mentions a product or service that does this. Accounts or reports on specific products are not advertising or marketing, however, promoting one over another is.

e.g. News story is mentioning personalized medicine, and how gene sequencing or ancestry services such as 23 and me are skipping the personnel to help decode the information and help consumers cope. This is not advertising or marketing. But as soon as the news story mentions how 23 and me is the cheapest solution for the same product this is not an article we should be reviewing, or it is actually advertising, or marketing disguised as a news story on a scientific discovery, paper or topic.

## Language

### Section I: Tone

#### 19) Fear Mongering

News stories should provide a fair, accurate, unbiased telling of a scientific discovery, paper, or topic. Any use of language that calls in an aspect of the reader's emotions or sense of awe are for entertainment or to affect the reader's opinion of what is being reported.

a) News story uses fear mongering

News story uses emotionally charged words to get an effect out of the reader. Often to scare them about what is being reported.

e.g. "If we don't bail out the big automakers, the US economy will collapse." And "What if we don't go to church? You will burn in hell forever."

#### 20) Sensationalist Language

News stories should provide a fair, accurate, unbiased telling of a scientific discovery, paper, or topic. Any use of language that calls in an aspect of the reader's emotions or sense of awe are for entertainment or to affect the reader's opinion of what is being reported.

a) News story uses sensationalist language

News story uses words to shock, startle, thrill, or instill a sense of awe

e.g. “you will never believe it”, “Now possible to cure old age”, “with this new engine we can go halfway around the world in no time”

## 21) Certainty

Science requires proof and experimentation and even after this, certainty is rare. So when news stories jump to conclusions about the certainty or uncertainty of a situation, this may spread misleading statements.

### a) Author justifies any certainty or uncertainty

News story contains statements of certainty or uncertainty but backs it up with a source or with the original research article.

### b) Author expresses certainty unjustifiably

News story contains a statement of certainty when there is no basis for one.

e.g. News story claims a new treatment will cure Alzheimer’s. Research article only said this treatment looks promising for finding a cure to Alzheimer’s.

### c) Author expresses uncertainty unjustifiably

News story contains a statement of uncertainty when there is no basis for one.

e.g. News story claims a vaccine is unlikely to protect against a disease you will likely never get. Research article provides evidence that a vaccine is helping prevent the spread of a disease in the first place.

## 22) Exaggeration

Exaggeration is used to sell headlines or claims or statements. Usually takes these claims or statements out of context which may mislead readers.

### a) Author exaggerates aspects of the research article

News story uses “stronger” words or adjectives to explain results or claims made by the research article.

e.g. News story claims a new treatment using Virtual Reality to help PTSD will be available in no time. Research article indicates the new treatment looks promising but is in early stages.

## 23) Minimization

Minimization is often used to downplay the importance of a claim or result, usually to promote a narrative against such research.

### a) Author minimizes aspects of the research article

News story uses “weaker” words or adjectives to explain results or claims made by the research article.

e.g. Research article claims using Virtual Reality to help PTSD has shown remarkable improvements in individuals managing their PTSD. News story mentions how using “video games” to help PTSD is nonsense, and only supported by “millennials”

#### 24) Incivility and Impoliteness

There is no need for a news story to use incivility or impoliteness in an accurate, unbiased telling of an account.

##### a) Author is not civil or is impolite

News story includes personal attacks against a researcher, the research, a group of individuals, or is racist, homophobic, sexist, etc.

#### 25) Emotionally Charged

There is no need for a news story that is supposed to be an accurate, unbiased telling of an account to use emotionally charged language. This is more indicative of an opinion piece and has no place in ethical journalism unless explicitly stated that it is an opinion piece.

##### a) Author shows signs of contempt

News story appears to be “judgey” of a new discovery, research, or researchers, usually due to the author/reporter’s own beliefs.

##### b) Author shows signs of outrage

News story contains statements, claims, or vocabulary that indicate the author is quite upset and angry with either the research or otherwise.

##### c) Author shows signs of spite

News story contains statements, claims, or vocabulary that indicate that the author is annoyed, irritated, or petty toward a new discovery, research or the researchers.

##### d) Author shows signs of disgust

News story contains statements, claims, or vocabulary that indicate that the author is sickened, disgusted, or very against such discovery, research, or the researchers.

#### 26) Punctuation

Punctuation tends to be used as an emotional tool or to skew a reader’s opinion of what they read.

##### a) Exclamation marks are used justifiably

News story contains exclamation marks in quotations from researchers etc.

e.g. News story contains a quote “...and much to our surprise!”

##### b) Exclamation marks are used unjustifiably

News story contains exclamation marks to emphasize the meaning of a sentence or a statement.

e.g. News story makes the following statement, “the use of rockets in this manner has never before been seen!”

c) Double punctuation is used

No reason whatsoever to use double punctuation. Otherwise only trying to entertain or instill excitement or shock to a statement or claim.

e.g. !! or ??

## 27) Style

News stories that are providing a detailed, accurate, unbiased telling of a scientific discovery, paper, or topic should use correct grammar, and should not use slang or humour as a way of adding entertainment value.

a) News story uses incorrect grammar

News story contains typos, errors in sentence structure etc.

b) News story uses colloquialisms or slang justifiably

News story uses a colloquialism (common saying) or slang as a way of explaining a complicated process in layman’s terms.

e.g. News story is reporting how a new planet in the solar system would be the equivalent of missing a huge white elephant in a room. It provides context.

c) News story uses colloquialisms or slang unjustifiably

News story uses slang or colloquialisms (common sayings) for entertainment value.

e.g. News story saying how creating synthetic organisms is wild.

d) News story uses humour justifiably

News story contains humour in a way that is explaining the researcher’s experience or a direct quote from the researchers.

e.g. News story contains “imagine the surprise of the researchers when their own creation outsmarted them”, which you have to be careful as this may be an exaggeration, or an algorithm legitimately beat the researchers in chess, context is key

e) News story uses humour unjustifiably

News story contains humour for entertainment value only.

## 28) Pronoun Use

News stories reporting about scientific discoveries, papers, or topics are not opinion pieces unless marked as such. Thus, the story should use pronoun use that is a third person unbiased, accurate telling of what is being reported.

a) News story contains first person or we/are unjustifiably

News story contains I or we statements outside of quotations. These tend to be used for opinions which may be masqueraded as fact when used in the news story.

### **Section III: Vocabulary**

#### **29) Wide or Varied Vocabulary**

Vocabulary used in a news story should be suitable for a target audience. If word choice is too complex or varied, aspects of the reporting might be lost in translation or the vocabulary may be exploited to try and confuse the reader or trick the reader into believing one thing over another.

##### **a) Vocabulary is suitable for target audience**

Look at other news stories published by the news outlet or website, if they have similar word choice around the board then it is likely suitable for their target audience. More sophisticated publications such as The Economist, The New York Times, and Scientific American tend to target a more educated audience than CP24 news etc.

##### **b) Vocabulary is not suitable for target audience**

Wide or varied vocabulary is used by the news story when their target audience would clearly be unable to understand.

e.g. CTV news starts using words such as mollify, abeyance, acerbic etc.

##### **c) Wide or varied vocabulary is used to be intentionally misleading**

Complicated and more sophisticated words may appear to be positive or negative in meaning. If a news story is reporting that CRISPR is bad and changing the original research article's claims about how CRISPR is good but in big complicated words that are hard to understand, this may confuse the reader or lead them to believe it is not so good. People tend to be uncomfortable with the unfamiliar.

#### **30) Jargon**

News stories reporting scientific discoveries, papers, or a topic will have to use jargon at one point or another. These are words that are understood by a particular group of people and not others. For example, if a biochemist is using the word mistranslation to talk about their research they may be referring to the process of mistakes in protein synthesis, however a linguist or a general member of the public may think otherwise.

##### **a) Jargon used is explained or of general knowledge**

News story accurately explains any complicated or unknown jargon in a way that is easy for the reader to understand. Common terms such as DNA, artificial intelligence, etc, do not need an explanation.

##### **b) News story contains unexplained jargon**

News story uses jargon specific to the scientific reporting but does not explain. These words might be confused or misunderstood by the reader's who may think the author/reporter is talking about one thing but in reality, it is something completely different.

e.g. News story explains how a computer program is not running as intended when utilizing unsupervised learning. Unsupervised learning may seem like the program is running off on its own or not following instructions or guidelines made by the researchers. In reality, unsupervised learning is just a form of machine learning where there is no input of categories or whatnot when a researcher is having a program learn how to classify or compare data.

c) News story contains unexplained jargon with intent to mislead

News story uses jargon specific to the scientific reporting but does not explain. News story is using the jargon in a way to push a narrative by purposefully not explaining what some of the words mean.

e.g. News story explains how a computer program is not running as intended when utilizing unsupervised learning. News story states how machine learning algorithms without control from researchers are dangerous and could lead to SkyNet from the Terminator series. Unsupervised learning here is not being explained in a way to mislead readers into thinking that the program is running wild or may disobey what researchers have set out.

## Accessibility

### Section I: Author

#### 31) Contact Information

It is important that contact information for the author is available. This is so any member of the general public can voice concerns or learn more about the news story itself from the original source, the author/reporter. This promotes transparency.

a) Author email is available

b) Author social media is available

c) No author contact information is available

News story contains no way to contact the author. If the reader is able to reach out to the news outlet or website to talk about the specific news story then it is acceptable however does not gain any positive score for doing so as this is the bare minimum.

#### 32) Biography, Details, Description

Background into who the author is provides credibility and transparency to the reporting. If the author is a random parent with no relevant work experience in the area or journalism, chances are there are going to be errors. Background should also help clear up if there is any conflict of interest.

a) Author biograph, details or description are available

A little bit of information, such as how long they have written for that outlet, where they have worked, what degree they may have, etc are all acceptable.

### 33) Other Publications

Having other news stories and publications available by the author/reporter can help clear up if there is a conflict of interest or if there is credibility to the reporting. This is almost always met.

a) Other publications from the author are publicly available

Can be linked directly on the webpage or found through search engine.

b) [**\* SciFeye Index v0.1, if no other publications can be found or all other publications are private this adds difficulty in further research and verification from us and members of the public for looking into the author/reporter of the news story.**]

## Section II: Sources

### 34) Sources Cited

Without source citations there is no way of verifying if claims made in the news story are true or not. It is important to cite your sources for individuals who want to verify the truth, as well as pursue the source to find out more information.

a) Sources cited are listed or clearly stated

News story clearly states the source of the information for the claim or statement or includes a reference list or list of sources after the article.

b) Sources cited are publicly available

News story uses sources that are available to the general public. If this is an interview, try to find the interview in a search engine. If it is a publication, check if the paper is in an open source location or if a member of the general public would be able to find a version to read. A good place to check is NCBI.

c) Sources cited are not publicly available

News story uses sources that cannot be accessed by the public. The public has no way of confirming or verifying if these sources are being used correctly or to learn more about the topic at hand.

d) Anonymous sources are justified

News story contains an anonymous source in a confidential matter. This will be rare.

e.g. News story is reporting on a new research article dealing with a major finding. However, has quoted an anonymous source from a whistleblower suggesting data has been falsified.

e) Anonymous sources are unjustified

News story contains an anonymous source for no real reason. Tend to be used to provide credibility to statements that are made from sources that have no real weight in the area.

e.g. News story is reporting on a new treatment for a disease. The news story quotes an anonymous professor saying this type of treatment is deadly and should be avoided. Without a proper citation or source, we have no idea if this professor is credible, in a related field, or just disgruntled.

f) **[\*\*SciFeye Index version 0.1, a new criterium will be added where a source is cited for a statement but is misquoted\*\*]**

### 35) Research Article

The ability for the general public to learn more about a recent scientific discovery, paper, or topic is of utmost importance, especially when it is of public concern, such as a health risk. The ability to learn more about the original research article is only possible when the original article is called out by name, and even more so when a link is provided to make access easier.

a) The original research article is publicly available

News story states the story is about a new paper. The original research article is accessible by members of the public, either on NCBI or another database, or a PDF is available.

b) The original research article is not publicly available or is paywalled

News story is reporting on an article not available to the public or requires a hefty fee. This limits the amount of information an individual would be able to learn more about and is difficult for others to verify if the news story is an accurate account.

c) Link to the original research article is present and clearly visible

News story clearly describes what it is reporting, the discover or paper might be called out by title, author, year and journal or otherwise.

## Presentation

### Section I: Components

#### 36) Images

When used correctly, images can add depth to a story. However, images are often the first thing user's see and can influence how they perceive the topic they are about to read.

a) Image is included in a neutral manner

News story provides an image that does not provoke emotion or favour a viewpoint.

e.g. News story about a new drug that is killing people shows a picture of the bottle.

b) Image is included in a flattering or positive way

News story includes an image that is meant to influence the reader into accepting the subject at hand is a good thing, which is not an unbiased approach.

e.g. News story about a new drug that is saving lives shows a picture of two individuals in an embrace.

c) Image is included in an unflattering or negative way

News story includes imagery that is meant to influence the reader into thinking of the subject in a negative light.

e.g. News story about a new vaccine includes an image of a baby crying with a needle in its arm.

### 37) Advertisements

When advertisements are used aggressively, the news stories delivered are not the product. The stories are simply ways to attract readers to advertisements. Sometimes, news “stories” can be masqueraded as truth or reporting, when in reality, the entire article is sponsored content or is promoting some product or service the author or website is selling.

a) Reasonable advertisement usage (less than 3 for the article)

News stories need to make revenue. Around 3 advertisements for a page would be modest.

b) Numerous advertisements (more than 3 for the article)

As the number of advertisements increases, the emphasis on the news story and its reporting tends to decrease. If it is a long article and there are four advertisements, you are allowed to use your discretion.

c) Article or website contains sponsored content

News story is either explicitly or subliminally promoting sponsored content. This might be reporting on a competitor’s product and providing the “real” product as an alternative with a biased viewpoint.

e.g. News story bashes the use of tablets and is talking about a paper that suggests too much screen time for children has negative health consequences. Author talks about the days where he remembers kicking a soccer ball around, and even mentions the name of one. The name appears too often in the article to be a coincidence.

d) Article or website contains related sponsored content

The news story is not only promoting content but is promoting related content, which is a biased way of reporting. This is unethical as there is a direct conflict of interest.

e.g. News story bashes the use of tablets. Is saying notebooks and small, cheap laptops are the way to go. The author or website has an exclusive deal for buying a notebook with a subscription as an alternative suggestion.

e) Advertisements are used in an aggressive manner

News story contains advertisements that are either popups or cover the content of the article. As for promoting subscription services to the website, although annoying, the line will be drawn here for acceptable.

f) Advertisement domain contains advertisements for false products

News story is not the product, and the advertisement is scamming individuals who click on the link. Credible websites and media outlets should not be promoting lies alongside “credible” reporting. Is typically a red flag for the credibility of an article.

### 38) Social Media Prompts

News story pages can aggressively push social shares which may be just looking to create drama for the purpose of attention and interest or to push a narrative.

a) Reasonable social media prompts (buttons at top or one or so prompts)

It is fine for websites to promote social media.

e.g. Under the news story title are the symbols and links to share the article on social media.

b) Numerous social media prompts (popups, overabundance of prompts)

Aggressive promotion of social media is often looking to create drama, promote a product or service, or attract attention. Is not a good indicator of fair and unbiased reporting.

e.g. Social media buttons and links at the top of the article and the bottom of the article.  
Halfway through reading a popup shows up on the screen to “Join the conversation”

### 39) Highlighted Sections

Highlighted sections are often used to create a more dynamic reading experience, however can be abused for entertainment purposes or for other intents.

a) Highlighted sections are used for depth of the story

News story uses highlighted section in a way to call attention to a fact or quote that does not change when taken out of context.

e.g. Highlighted box with a quote saying, “This treatment is saving lives”. Research article makes claim that the treatment has saved the lives of 15 people so far.

b) Highlighted sections are used for dramatic effect

News story uses highlighted section just to create drama and not for the purpose of depth.

e.g. Highlighted box with a quote saying, “Researchers are fighting a war amongst themselves over cancer treatments”. Research article provides new research in an area that was debated before.

c) Highlighted section is taken out of context

News story takes a quote or claim out of context which changes the meaning or the weight of the original meaning.

e.g. Highlighted box with a quote saying, "The flu virus is exceptional at killing people". Research article makes claim that the flu virus tends to be more lethal in the elderly or those with compromised immune systems.