

Annotation Guideline for Tweet Analysis

1 Objective of Guideline

This guideline is designed to support the identification of specific linguistic expressions in Tweets related to efficacy beliefs and various emotional and sentiment expressions regarding climate change and other environmental issues.

2 Text Documents for Annotation: Tweets

Tweets from environmental and climate groups will be annotated. Meaning, the Tweets that are categorized are from groups and not individuals. This fact is particularly important to keep in mind when categorizing emotions, as the focus should be on the use of emotional language and not on the emotions that the writers felt or that the Tweets might evoke in the readers. Same applies to categorizing efficacy beliefs. It should also be noted that tweets tend to be highly ambiguous, meaning that not all tweets are clear and understandable. For illustration, this guide includes several examples for most of the categories [6]. Some of the examples have an explanation attached.

Example: This type of example directly aligns with the category definition and effectively illustrates the category in a clear and relevant manner. It serves as a primary reference for understanding the category in context.

Atypical Example: This example deviates from the norm of the category definition but still retains some connection. It may demonstrate an unconventional perspective or a more nuanced view of the category being annotated.

3 Annotation Instructions

Category Columns: Each category has a designated column in which the numbers are to be entered.

Clear Categorization: Each statement should be clearly assigned to one or more categories. If there is doubt, note this for further discussion in the *Note* column. Assigning of no category or more than one category is possible in all cases.

Consider Context: The meaning of statements may vary with context. In ambiguous cases, interpret the speaker's intention as accurately as possible.

Smileys: Smileys in the text can be included in the assessment.

Language: Text that is not in English can be ignored/skipped.

4 Annotations

1. Climate Detection: About Climate Change (1)/ Not About Climate Change (0)

Definition: Indicates whether the text explicitly/implicitly addresses climate change or focuses on another topic. This other topic may be activism, may have a different environmental focus or may be (completely) unrelated.

Example for About Climate Change: "Climate change is one of the greatest threats of our time."

Atypical Example for About Climate Change: "Indonesia is joining the Global Climate Strike alongside Fridays for Future Indonesia and Jeda Iklim! They're standing up against fossil fuel industries that are damaging the environment and impacting their local communities!"

Example for Not About Climate Change: "This place is extremely biodiverse"

Atypical Example for Not about Climate Change: "#FridaysForFuture" (*The naming of organizations or individuals with a strong public connection to climate or environmental issues is not sufficient for this category.*)

2. Climate Change Sentiment

Definition: Distinguishes between presenting climate change as a threat/negative, as an opportunity/positive, or as a neutral issue. Prerequisite: A text must be about climate change in order to be assigned one of these framings.

- **RISK (-1):** Climate change is portrayed as a threat or danger.
- **OPPORTUNITY (1):** Climate change is portrayed as an opportunity for positive change, progress or solutions are mentioned.
- **NEUTRAL (0):** Climate change is portrayed without evaluative connotations.

Example for Risk: "Rising sea levels threaten coastal cities worldwide."

Atypical Example for Risk: "We face a choice between supporting oil companies or preventing a catastrophic climate crisis."

Example for Opportunity: "Switching to renewable energy creates new jobs."

Atypical Example for Opportunity: "Here is a report about people's resistance efforts, traditional stories, and how indigenous perspectives can

play a role in tackling climate change.”

Example for Neutral: ”Climate change affects various weather phenomena.”

Atypical Example for Neutral: ”This is promising progress, but we aren’t going to get to zero emissions without political action.”

3. Emotional Language

If emotional language related to a specific emotion is used, code it with a 1, if not, code it with a 0. Differentiation of the following specific emotions:

- ANGER: Expression of frustration or rage [1].
- CONCERN: Expression of perceived seriousness of a problem [7].
- FEAR: Expression of discomfort or distress related to a threat [5].
- HOPE: Expression of goals along with ability and/or motivation [4].
- JOY: A positive affective response to something/someone [2].
- PRIDE: Expression of satisfaction or positive affect along with achievements [8].
- SADNESS: Expression of loss or failure [3].
- SOLIDARITY: Expression of unity or connectedness [9].

Examples for Anger:

”It’s infuriating to see politicians ignore climate science!”

”With rise in temperatures, MAPA (Most Affected People and Areas) will be affected first and will suffer the consequences of the CAP. THIS IS NOT AN ACCEPTABLE CAP! (6/n)”

”In the Global South we know that revolutionary struggles often cannot succeed through institutional mechanisms. Meanwhile the European climate movement, in love with the political and economic elites of their countries, is pathetic and opportunistic”

Examples for Concern:

”Today we are disappointed and worried: The Supreme Court of Norway has chosen to back oil over our rights to a liveable future. The state won with a majority of 11 against 4 votes.”

””Outrage at secretive int’l tribunals where fossil fuel co’s sue govts for passing environmental protection laws. Fears that such cases are slowing down action on the #climate, & concern that the UK is exposed to oil firms suing to prevent green policies””

”From documenting rivers to climate change and ruminations about sustainable landscapes, these women all share a common passion in bringing their voice to environmental stories that they care about. #IWD”

Examples for Fear:

"The alarming state of nature in the UK is a matter that should concern everyone."

"With climate change raising Arctic temperatures faster than the global average, wildfires are shifting poleward, blackening the skies with smoke.. 'Beautiful, terrifying visuals from ReutersGraphics "

"As more #ClimateChange impacts are felt and people become increasingly aware of the challenging future we face, it is understandable that many people are experiencing a myriad of feelings. Here are some very useful resources to cope with climate anxiety and grief. #SelfCare"

Examples for Hope:

"Every tree planted is a step towards a healthier planet. Join us in our campaign to plant 1 million trees this year!"

"'Winds of Change' is an Extinction Rebellion movement of movements campaign, spreading a vision of a green and just future."

"shellmustfall launches a collection of research, stories & visions to collectively make Shell history. It is clear that we need to fight end the era of fossil fuel companies and this website is a good starting point."

Examples for Joy:

"We're celebrating today as more cities commit to 100% renewable energy!"

"Been fascinated by this plant ever since I first heard of it. So cool you were in its presence!"

"From Brazil to Indonesia, from Australia to Senegal and beyond, 2023 was full of inspiring the actions of our courageous volunteers and activists. Here's to a new year with even more climate action!"

Examples for Pride:

"Proud of our community for coming together to reduce plastic waste!"

"We are proud to have stood with them in court. You can read more about them and their amazing work here... "

"This judgment is a huge win for our climate. We're proud to have brought this case to court."

Examples for Sadness:

"It's heartbreaking to witness the destruction of the Amazon rainforest."

"Ecologists may understandably feel the weight of these realities, but there is no time for despair. We have to get on with the challenge of turning toward a genuinely ecological society."

"Today's Queen's Speech was disappointing, and reveals a Government that is more interested in stoking division than tackling the very real crises the country faces. A thread of the new plans announced... "

Examples for Solidarity:

"In unity with our brothers and sisters across the globe, let's stand united for climate justice."

"Love and solidarity to the other 'climate justice movements' mentioned in IPCC.CH's Mitigation of Climate Change report."

"A climate activist told us that an explosion happened 100 meters away from her house. Solidarity with the Lebanese climate activists & people!"

References

- [1] T. Gregersen, G. Andersen, and E. Tvinnereim. The strength and content of climate anger. *Global Environmental Change*, 82:102738, 2023.
- [2] M. K. Johnson. Joy: A review of the literature and suggestions for future directions. *The Journal of Positive Psychology*, 15(1):5–24, 2020.
- [3] H. C. Lench, T. P. Tibbett, and S. W. Bench. Exploring the toolkit of emotion: What do sadness and anger do for us? *Social and Personality Psychology Compass*, 10(1):11–25, 2016.
- [4] M. Ojala. Hope and climate change: The importance of hope for environmental engagement among young people. *Environmental education research*, 18(5):625–642, 2012.
- [5] S. O’Neill and S. Nicholson-Cole. “fear won’t do it” promoting positive engagement with climate change through visual and iconic representations. *Science communication*, 30(3):355–379, 2009.
- [6] J. Saldaña. The coding manual for qualitative researchers. 2021.
- [7] H. Sandvik. Public concern over global warming correlates negatively with national wealth. *Climatic Change*, 90(3):333–341, 2008.
- [8] C. R. Schneider, L. Zaval, E. U. Weber, and E. M. Markowitz. The influence of anticipated pride and guilt on pro-environmental decision making. *PloS one*, 12(11):e0188781, 2017.
- [9] S. Tong, J. M. Samet, W. Steffen, P. L. Kinney, and H. Frumkin. Solidarity for the anthropocene: From the widening inequity to climate change and beyond. *Environmental Research*, page 116716, 2023.