THE UNIVERSITY *of* EDINBURGH

Researching Responsible and Trustworthy Natural Language Processing

Week 2: Qualitative Analysis

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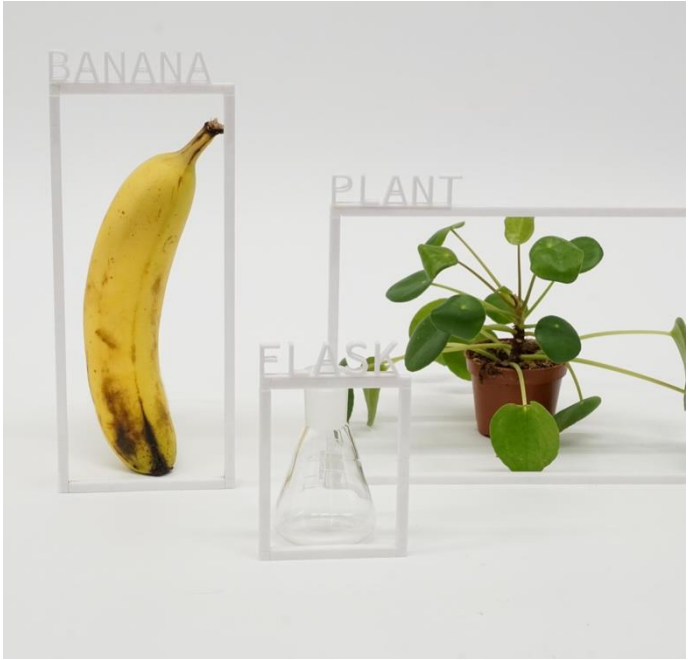
Recap: What are research methods?

Strategies or processes used during research to uncover new information or to understand a topic.



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Different types of research aims

Exploratory

Explanatory

Descriptive

Quantitative	Qualitative
Mainly deductive, testing of theory	Mainly inductive, generation of theory

Deductive Approach

Theory

↓

Observations/Findings

Inductive Approach

Observations/Findings

↓

Theory

Qualitative Research is …

- Qualitative research is concerned primarily with words and images rather than numbers
- It is usually inductive
  - The process starts with field research, then concepts and theories are developed
- It tends to be interpretivist
  - Concerned with finding out what an action or event means to the people involved

(Bryman & Bell, Social Research Methods)

Qualitative Research is …

- Often constructionist
  - Social life is not seen as fixed, but as an outcome of interactions and negotiations

- Takes a naturalist perspective
  - When doing research, the social world should be left as undisturbed as possible

Kinds of Qualitative Research

- Ethnography/participant observation: Immersed in the social setting
- Qualitative interviewing: In-depth, semi-structured or unstructured
- Focus groups: Invite several people together for a discussion or activity
- Discourse and conversation analysis: Analyse the language
- Qualitative analysis of texts and documents
- Participatory action research: Engage participants to produce social change

Qualitative Research: Theory and concepts

- Qualitative research often involves “grounded theory” approach: the use of data to develop theories
  - This may involve an iterative process: going back and forth from data to theory, revising the theory in the process

- Qualitative research may involve testing theories
  - This can be done through an iterative process, or occasionally through theory testing in the conventional sense

Qualitative Research: Reliability and Validity

- LeCompte and Goetz
  - Different meanings for key terms
  - External reliability
    - Degree to which a study can be replicated
    - Difficult to achieve in qualitative research
    - Ethnographer adopts the same social role as previous researcher
  - Internal reliability
    - Do different observers see the same things?

Qualitative Research: Reliability and Validity

- Internal validity
  - Is there a good match between what is observed and the resulting theoretical ideas?
  - Strength of qualitative methods

- External validity
  - Can the findings be generalized across social settings?
  - Difficult to achieve in qualitative research because of small sample sizes

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Qualitative Interviews

Qualitative interviewing is less structured and more likely to evolve as a natural conversation
- Can be a part of ethnography or stand-alone
- Is unstructured or semi-structured
- Includes life-history interviews (studying biography), oral history interviews (studying historical evens as reflected in people's lives), focus groups, expert interviews
- Aims to get a story (narrative interviews), or personal expertise/opinions and attitudes

Interviews

Starting Assumption:
- you have access to at least one individual, often 5-10
- Those people are willing to spend at least 30-60 minutes being interviewed
- Thoe people will be able to provide you with information that help you to directly address your research questions

2 Types of Qualitative Interviews

- Unstructured (less often)
  - The researcher uses only a brief set of points to introduce topics.
    - The only thing defined is the broad topic of interest
    - Conversational
    - No more than a short interview guide
    - Starts with a single broader question
    - Respondent's answers are in a free form

2 Types of Qualitative Interviews

- Semi-structured
  - The researcher has a list of questions or topics to be covered.
    - Offers a somewhat longer interview guide
    - Interviewees are still free to reply in any way they choose
    - Questions may be asked out of order
    - New questions may be devised and asked on the spot
    - There is a clear focus on the topic of interest
    - Useful when more than one interviewer
    - Useful when there are several interviewees

Interviews: Research Questions

- Good for research questions about …
  - What's actually going on in inside someone's head
  - People's perceptions and feelings
- Not so good for research questions about …
  - What actually happened
  - Large populations

Qualitative Interview Guide

- Establish some degree of loose order to the questioning process
- Broad questions related to the research issues – **matching with RQs**
- Language that is understood by the participants
- No leading questions
- Prompts to ensure sufficient personal information about the individual participant is collected to contextualize the data

Qualitative Interview Guide

- Before the interview:
  - Familiarize yourself with the setting to contextualize the data
  - Make sure you test your recording tech
  - Decide whether you need audio only or also video, and/or screen capture
  - Use a quiet and private setting for interviews

Qualitative Interview Guide

- Use good interview techniques (active listening):
  - Be knowledgeable about the topic of the study; clear in asking simple and understandable questions
  - Be gentle, sensitive, and open, so that the interviewee can freely express their opinion and not be interrupted
  - Be flexible and steering: flexible enough to respond to the new themes raised by the participant, but steering to redirect discussion
- **Practice with family/friends before your first interview**

Qualitative Interview: Questions

- Introducing questions
  - "Please tell me about when your interest in X first began"
- Follow-up questions
  - Rephrase the interviewee's answer and ask them to elaborate on the answer
  - "When you said that you are motivated, what do you mean by that?"
- Probing questions
  - Short general questions inviting the respondent to reflect more deeply on what they already said without particular reference to details
  - "What do you mean by this?" "Can you give me an example?" "How so?"

Qualitative Interview: Questions

- Specifying questions: factual
  - "What did you do then?"
- Direct questions: interviewee perceptions
  - "Do you find it easy to keep smiling when serving customers?"
  - Best left until later in the interview, in order not to influence the direction of the interview too much
- Indirect questions: perceptions of others
  - "How do you feel about . . . ?"
  - "What do most people around here think of the ways that management treats its staff?"

Qualitative Interview: Questions

- Structuring questions
  - "Now I would like to move on to a different topic"
- Silence
  - A pause will give the interviewee an opportunity to reflect and amplify an answer
  - Don't pause for so long that the interviewee feels embarrassed
- Interpreting questions
  - "Do you mean that your leadership role had to change from one of encouraging others to a more directive one?"

Interviews: Good to Know

- Interviewees must be willing and able (don't plan to interview people who won't make themselves available)
- Interviewees must be eligible, i.e. be able to provide useful input; be the expert you need; eligible to represent a certain population/sample
- Finding and recruiting enough interviewees is an often underestimated challenge
- Interviews take time to schedule and conduct
- Qualitative interviews should be transcribed
- These then represent your dataset

Focus Groups

- Focus groups are a discussion/activity with(in) a group of 5-8 (-ish) people who can interact with one another and the interviewer
  - **The value of focus groups is gaining access to the meanings that develop during the interaction with others rather than in isolation**
  - **May bring out a wide variety of perspectives on an issue**
- Brings out why people feel the way they do
- A moderator or facilitator makes sure the discussion stays on the issue without directing too much; makes sure all the people participate

Focus Groups

- Natural groups: people who already know each other or already have had some interaction
  - May be appropriate, depending on the goals of the research
  - Useful if the research is actually about how social interaction occurs

- Disadvantages:
  - Pre-existing styles of interaction or status hierarchies may affect the discussion
  - The group may have taken-for-granted assumptions that are not challenged

Asking Questions in Focus Groups

- Usually a small number of questions is used
  - Opening, clarifying, or refocusing the group

- Amount of intervention taken by the moderator depends on
  - the topic of the discussion
  - how much knowledge the participants have
  - the goals of the research

Limitations of Focus Groups

- Less control over discussion than interview
- An unwieldy amount of data may be produced
- The data may be difficult to analyze
- Personalities traits in room (dominant, quiet)
- Difficult when sensitive issues, social hierarchy, strongly opposed positions

Online Focus Groups based on Chats

- Advantages:
- Usually smaller: Six to eight people
- May be more difficult to moderate
- Several responses at once - flow is difficult
- Overcomes geographical issues and sensitive topics
- Visual biases reduced
- Less reactive response to moderators
- Often a safe and friendly environment,
    - Done at home

Observations: Starting Assumptions

- Observations provide access to populations are are meant to result in systematically recorded behaviours, actions and interactions of people in their natural, unaltered environment
- You have access to a “scene” (group of people or place where people spend time, such as a workplace, online forum)
- Often requires a “gate keeper”
- Often requires permission from a group leader
- You will need ethics approval

Participant Observations: The Basics

- Only observation ("complete observer")
  - Take in-depth notes on observations, often while you observe
  - Can also "count" how many times an event occurs
- Interaction during observation
  - Be a member of the group and participate in group activities
  - BUT: Don't forget the Observer's Paradox challenge!
  - Take notes after each interaction and keep a journal
  - Conduct textual analysis on notes and journal

Observations: Good to Know

- For qualitative observation, you will need to keep a detailed journal & a detailed diary, field notes
- In non-public settings OR when engaging individuals:
  - the people you are observing know that you are doing research
  - you have ethics approval
- You have time to collect enough data for your project
- Time is your biggest challenge here

Analysis Strategies: Analytic Induction

- Qualitative analysis is an iterative process
  - Analysis starts after some data has been collected
  - Further data is gathered on the basis of that analysis

- Analytic induction
  - A general research question is devised
  - Some data are gathered

- The researcher continues to gather data until no contradictory cases are found

Analysis Strategies: Analytic Induction

- Difficulties with analytic induction
- Because all cases must be explained, the hypotheses generated may be too broad to be useful
- There are usually no guidelines on how many cases must be reviewed before the validity of the hypothesis is accepted

Analysis Strategies: Inductive, Iterative Process (Grounded Theory)

- Systematically gather data
- Analysis throughout the research process

- Qualitative analysis (grounded theory) includes processes like:
  - Coding, can also include counting
  - Constant comparison (of data and concepts)
  - Theoretical saturation
  - A point in time when nothing new is being learned

Outcomes of Qualitative Analyses

- Concepts
- Categories (encompass two or more concepts)
- Properties (attributes of a category)
- Hypotheses (can then be tested with quantitative methods)
- Theory
- Types (can then be tested with quantitative methods)

Textual Analysis

- Cover term for a wide range of techniques/analytical approaches, such as:
  - Content analysis
  - Conversational analysis
  - Database techniques for ethnographic studies
  - Discourse/critical discourse analysis
  - Linguistic/semiotic/multimodal content analysis
  - Narrative analysis
  - Computational linguistic analysis (NLP)
  - Website/structure analysis
  - …

Textual Analysis

- You have access to a “text”
- A “text” can be words, images, objects, videos, websites, etc.
- Examples:
  - Corpus of social media content, memos from an organization, commercials from a political campaign
  - Transcribed interviews, responses to open ended survey questions
  - Videos and their comments, likes, etc.
  - Notes taken while doing field research

Textual Analysis

- Textual analysis involves not just analyzing the content but also the structure or design of a ‘text’, how elements function, the historical/cultural context
- Textual analysis uses “codes” to identify patterns in text
- Codes can be…
  - Top down: determined by what you expect to find
  - Bottom up: determined by what emerges from the data

Textual Analysis Strategies: Coding

- Coding:
  - Includes labels given to issues/activities being observed that can be grouped together
  - Starts in early stage of research project
  - Coding is the first step in interpreting data and developing theory
  - Data are treated as potential indicators of concepts
  - The indicators are repeatedly compared for concepts/categories

Textual Analysis Strategies: Coding

- Types of coding:
  - Open:
    - Identifies initial concepts that will be categorized together later
    - Close to the data
  - Axial:
    - Data are reviewed for linkages and re-organized according to those connections
    - New codes may be developed

Textual Analysis Strategies: Coding

- Types of coding:
- Selective:
  - Selecting the core category / categories
  - Validating the relationships
  - Identifying gaps that need to be filled in
  - Conceptualizing the phenomenon (emerging theory)

Coding in Qualitative Analysis

- Coding questions:
  - Of what general category is this datum an instance?
  - What does this datum represent?
  - What is this datum about?
  - What question does this datum suggest?
  - What sort of answer to that question does this datum imply?
  - What is happening here?
  - What are people doing?
  - What do people say they are doing?
  - What kind of event is going on?

Coding in Qualitative Analysis

- Basic coding
  - Getting the simplest labels for the material, such as negative and positive consequences of the analysed activity
  - Produces a superficial analysis, and needs to be followed by other steps
- Deeper awareness of the content in the text
  - Rework original codes to more fully reflect the content of the text, relate codes to the focus of the research, to what is included and what is missing
- Exploring broader analytic themes
  - Researcher moves away from the content of specific interviews and looks for broader analytical themes.

Steps and Considerations in Coding

- Code and transcribe as soon as possible
- Read through the data before considering any interpretation
- Read through the data again
  - Note keywords, themes (do the coding)
- Do not be concerned with producing too many codes, this is normal at the beginning
  - The codes can be tidied and changed later on

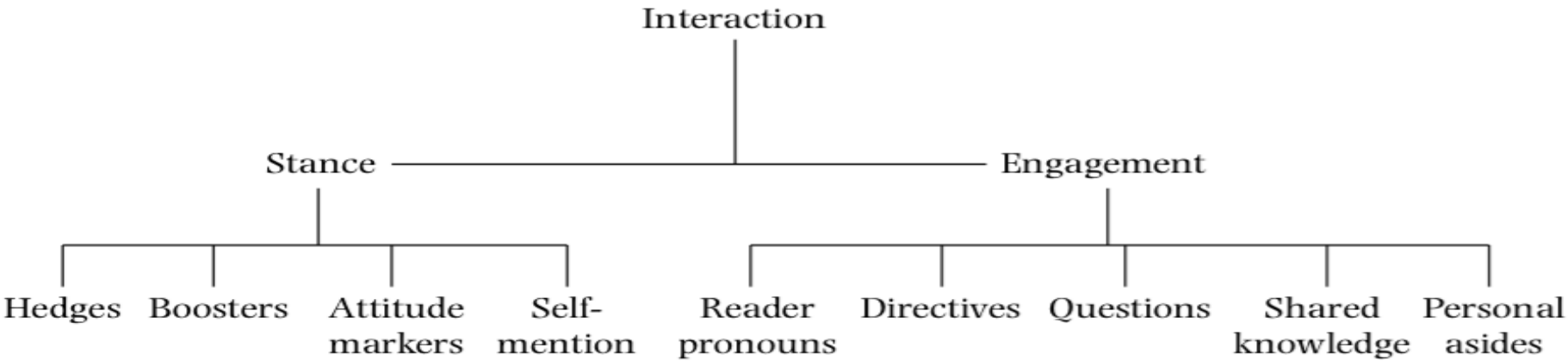
Steps and Considerations in Coding

- Review the codes to consider associations, redundancy, relationships to existing concepts
- Consider general theoretical ideas regarding codes and data
- Keep coding in perspective:
  - Consider codes' broader significance for the research project and interpretation, their relevance to the existing literature, to the lives of the studied people

Sample Codebook Development

Study on academic ‘leaders’ on X; how they linguistically interact with followers

- Hyland (2005) – Interaction in academic discourse
- Letierce et al. (2010) – Twitter usage in academia
- Herring (2007) – Cpmputer-Mediated Discourse Analysis



From: Hyland (2005) – Interaction in academic discourse

Interaction

Interaction (in academic writing) involves ‘positioning’, or adopting a point of view in relation to both the issues discussed in the text and to others who hold points of view on those issues

Interaction

Stance: attitudinal dimension and includes features which refer to the ways writers present themselves and convey their judgments, opinions, and commitments.

Engagement: an alignment dimension where writers acknowledge and connect to others, recognizing the presence of their readers, including them as discourse participants, and guiding them to interpretations.

Together, these resources have a dialogic purpose in that they refer to, anticipate, or otherwise take up the actual or anticipated voices and positions of readers (Bakhtin, 1986).

Interaction Analysis Codebook

Author
Follower / Following
Unit of Analysis: Text, URL, Text & URL
Modality (URL)
Type of Message (Tweet, Re-Tweet)
Type of Interaction (Monologue, Dialogue, Polylogue)
Discourse Type (Narrative, Descriptive, Expository, etc.)

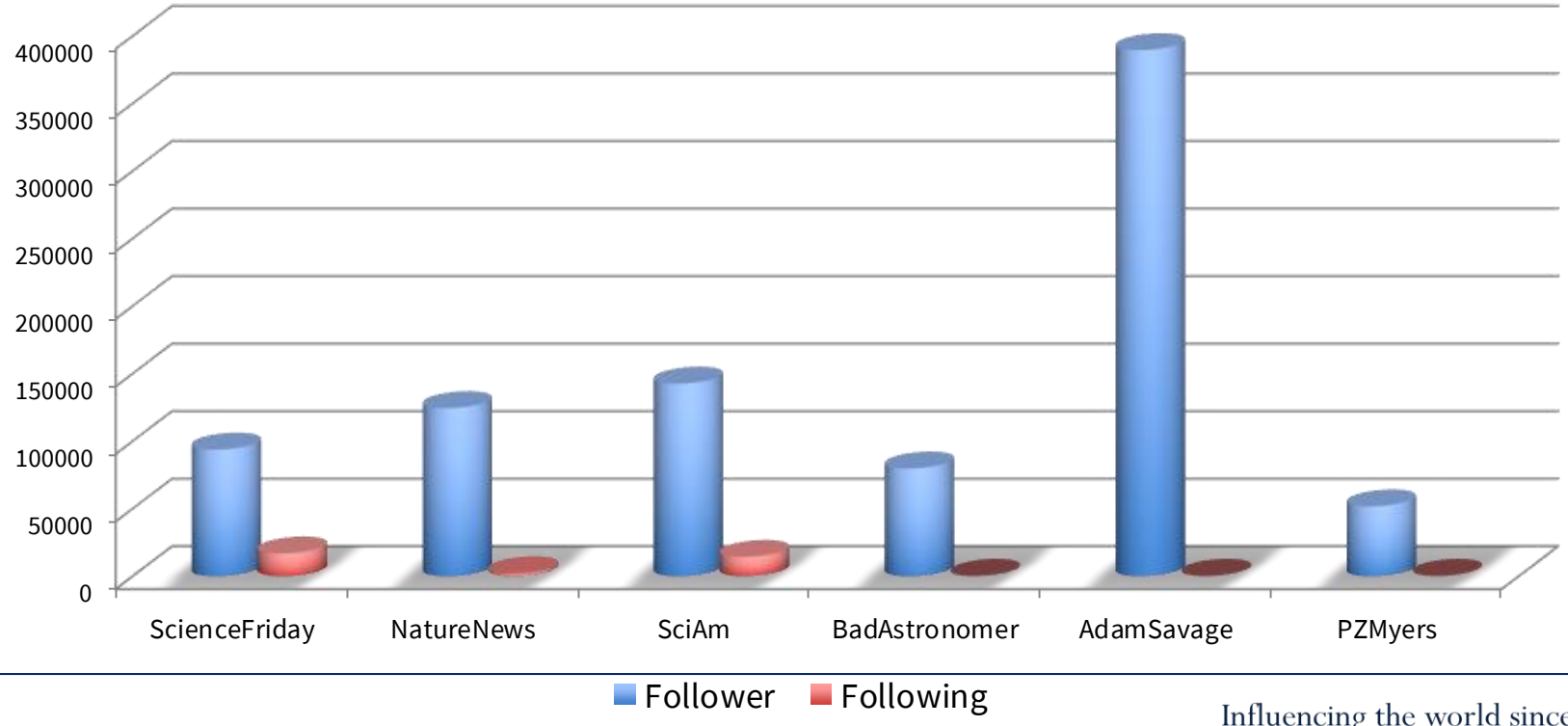
Interaction Analysis Codebook

Topic/Theme
Hashtag
Tone (formal/scientific, casual)
Rhetorical Figures (Hedges, Boosters, Self-Mention, Pronouns, Appeals to Shared Knowledge, Directives, Questions)
Scientific/Technical Language

Sample

Most influential scientific profiles

300 Tweets per student, timespan of 3 months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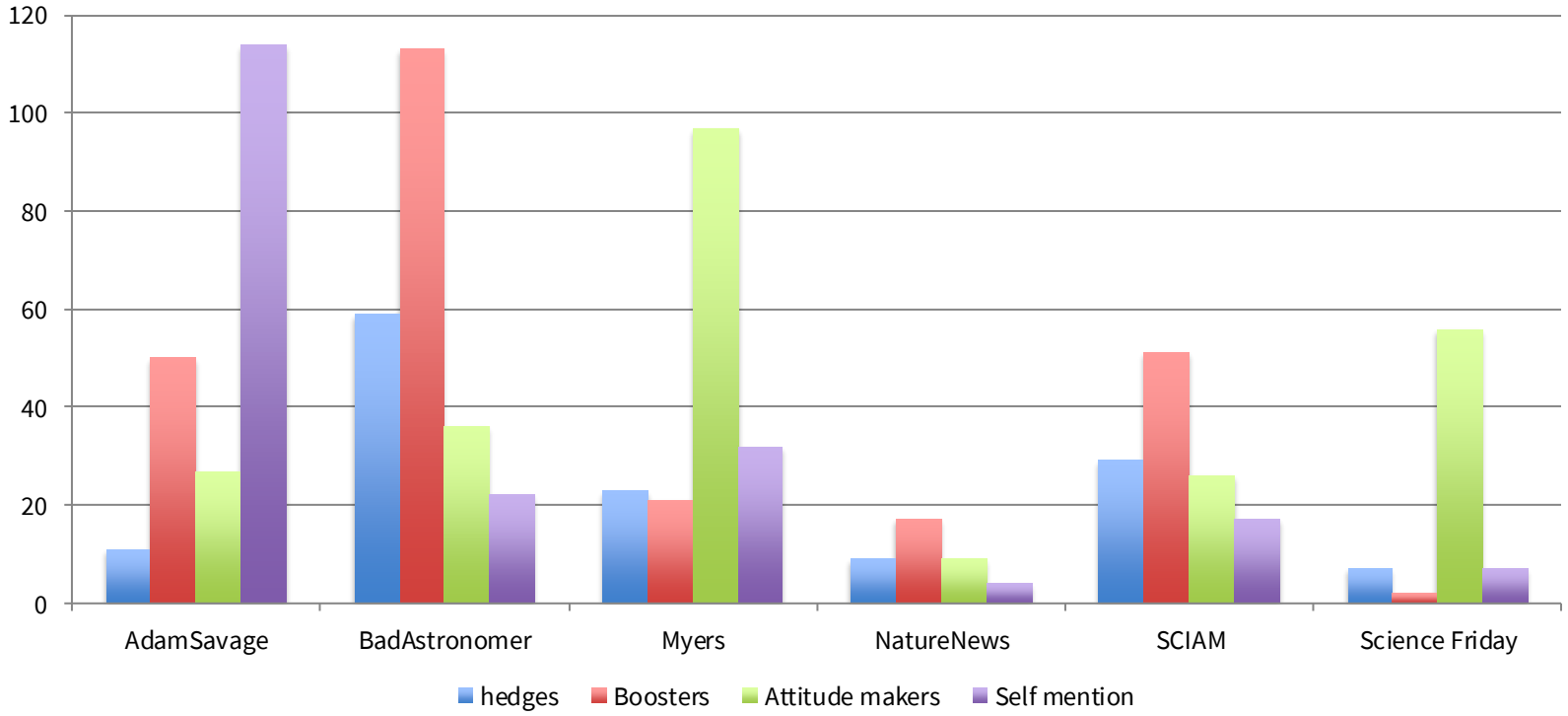
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