



SCIENTIFIC REASONING AND DEBATE

Oxford Guide to Effective Argument & Critical Thinking, Colin Swatridge,
Oxford University Press

Debating

- *"Sooner or later all the people of the world will have to discover a way to live together in peace... If this is to be achieved, man must evolve for all human conflict a method which rejects revenge, aggression, and retaliation..."*
 - Dr. Martin Luther King, Jr. – 1964 Nobel Peace Prize Acceptance Speech
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Debate

- Association
- $P \rightarrow Q$
- Inference
 - P implies Q
 - Q infer P

,

Hypothesis / Question



Argument / Claim (P)



Reasons (R) / Evidence



Conclusion (Q)

INFERENCE

Arriving at a conclusion based on reasoning



Deductive Reasoning

- Using more abstract principles to apply a conclusion
- Using logical reasoning / steps

Inductive Reasoning

- Using examples to conclusions
- Generalisation to abstract principle
- Estimating can not be certain

Examples of inference
and deduction

How to Make Yourself Clear

Argument / Claim
Question / Hypothesis



Avoid **vagueness** by **defining** the terms you will use



Be **precise** about the scope of your argument



Be aware of any **assumptions** that you may be making



Take care not to use **ambiguous** language



Be wary of **conflating** terms that ordinarily have different meanings

Examples Of clarity

- Ch2

Counter Argument



Your Argument needs to out weight your opponents



Selection and evaluation of sources



Reputation and expertise

What to make of other's Arguments

miss-represent, exaggerate its defects

Strawman was set-up

There was exaggeration or Overstatement

Causes and Conditions

- A cause-effect suggested mistakenly
- Correlation mistaken for causation
- Misunderstanding or confusion of necessary and sufficient conditions

Appeals to the history, tradition, authority may be open to question

Emotive appeal to feelings may missfire

Supporting your case



Examples and
anecdotes



Facts and
factual claims



Statistical
Evidence



Credibility and
corroboration

Can you
compare?

Analogy - Correspondence

- Both have nutritional value
- Both are round
- Both can make fruit juice
- Both have seeds
- Both can rot
- You must pick both from a tree



Use of Statistics

Statistics is the branch of Maths dealing with uncertainty

Sample data from a population



Abuse of statistics

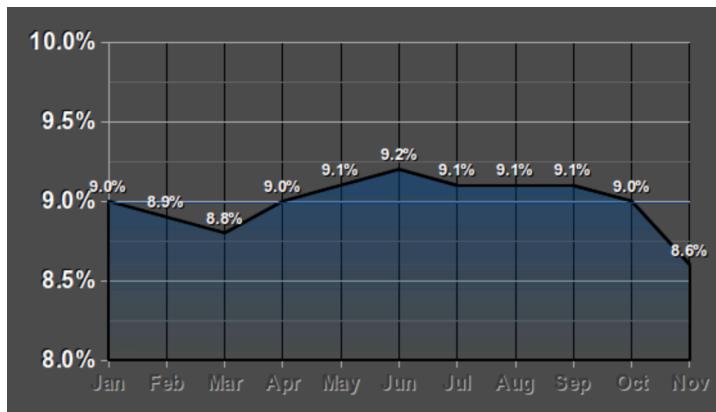
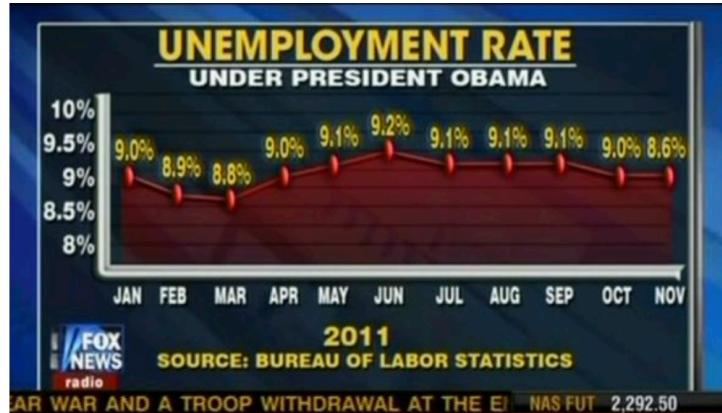
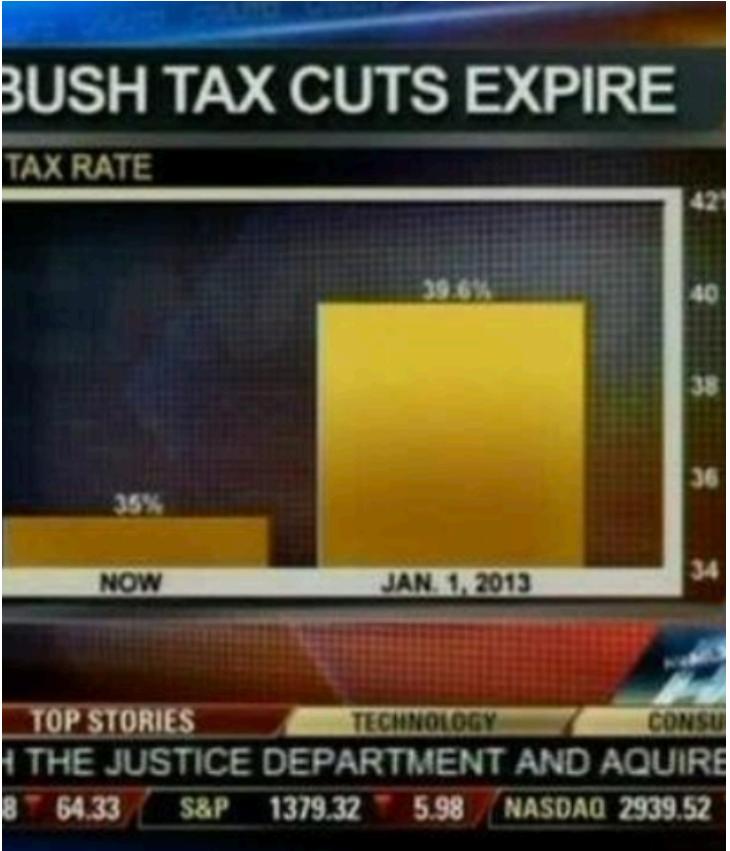
Lies, damn lies
and statistics

Using different
units of
measurement

Politicians are
the worst

Sample sizes
not used

Abuse of Statistics



- Inadequate Statistics Information
 - Sample size
- Rule of Averages
 - Means can be distorted by outliers
- Graphs
 - Scales
- Percentage and percentage points
- Manipulation of the Sampling
 - Sample Bias
 - Area Bias
 - Self Selection Bias
 - Leading Question Bias
 - Social Desirability Bias

How much surety

- Avoid the word **certain**, other than when stating facts
- Discriminate between what is **probable**, **plausible** and **possible**
- Use **deductive** argument with care, if at all
- Beware **conditional** or **hypothetical** claims generally lead to conditional conclusions
- Speak of **truth** on to the extent that evidence provides a logical truth.

Matter of Belief

- Opponents Argument (A)
- Be alert to belief that may lead to bias and in turn ill-considered and subjective opinion
- Argument B bias in your own position
- Aim to be objective (with possibly inappropriate neutrality)
- When expressing option do so after marshaled evidence will be considered judgement over prejudice
- Avoid committing to a principle of an absolute unless in universally held.

Over Simplification

- False dichotomy
 - Take-it or leave-it
- Over generalization
- Analogy and Slippery Slope

Analogy - Creating interest and fun

Anecdotes



"I like talking to myself. It is one of my greatest pleasures. I often have long conversations all by myself, and I am so clever sometimes I don't understand a single word of what I am saying."



The Rocket from *The Happy Prince and Other Tales* by [Oscar Wilde](#)

Metaphors

- The assignment was a **breeze**.
(This implies that the assignment was not difficult.)
- It is going to be **clear skies** from now on. (This implies that clear skies are not a threat and life is going to be without hardships)

Does your argument hang together

- Contradiction
- Consistency and coherence
- Changing the subject
- Begging the question

Laying out your case



Structure of Reasoning



Intermediate Conclusion



Alternative Inferences

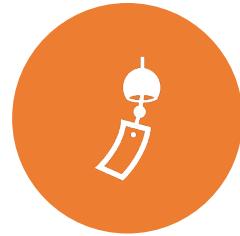


Quotation and Referencing

Constructing & Organizing your Argument

- Objective information
- Detailed research
 - In depth information
- Valid and viable interpretations of the motion
- Chucking
 - Up (Deductive reasoning)
 - Abstract principles
 - Down (inductive reasoning)
 - Real world – personalize it to the people in the room – or story about someone
- Sideways
 - Analogy
 - - compare them
- Write clear significant points
 - Visual illustrations
 - Help outstanding objective argument
- Using verbal
 - Examples – to highlight
 - Analogies
 - Correspondence
 - Inference
 - Metaphors
 - Anecdotes

Debate Presentation



AUDIBILITY



ENGAGEMENT



CONVICTION



AUTHORITY



LIKEABILITY

Format and Jargon of Debates

- Jargon of debates
 - Moot / Motion / Resolution
 - Statement or topic for debate
 - 2 or more people are needed to debate
 - Agree or Disagree with the motion
 - rebuttal - Refute, disprove
 - Structure
 - Protected time first and last 60 seconds of presentation
 - POI points of Information
 - POO Points of order
 - Barrick – succession of quick POIs (20 seconds min time)
 - Squirrel is an attempt to illicitly or rationally shape the motion
- Our Debate format:
 - Teams of approx. 4
 - Running order:
 - Affirmative (For) [5 mins]
 - Negative (against) [5 mins]
 - Pause for time to construct a riposte [3 mins]
 - Affirmative (for) first riposte [3 mins]
 - Negative (against) first riposte [3 mins]
 - Pause for time to construct a riposte [4 mins]
 - Affirmative (for) final riposte [3 mins]
 - Negative (against) final riposte [3 mins]

Preparing for your debate

- Reading and keeping records of sources of information
 - News
 - Papers
 - Speaking with others
 - Need to find evidence
 - Develop a habit of note taking
 - Observe other presenters

 - Evaluate your material
 - Use a dictionary to improve vocabulary
 - Don't be too colloquial expressions
 - Open with a bang - Crucial points last
-
- Que cards
 - Remember to number them
 - Occasional peaks
 - Place them on the podium

 - Know your material

 - Dissecting Effectively
 - Understanding the view point of the opposing team
 - Subjective view
 - False equivalency
 - opinion

% Levels of Performance						
Criteria		0- 39 (fail)	40-49 (fail by small margin)	50 – 59 (Pass)	60 -69 (Merit)	70 – 100 (Distinction)
Individual Scores 75%						
1. Organization and Clarity: viewpoints and responses are outlined both clearly and orderly.	20	Entirely unclear in most parts, total lack of augment being tied to an idea (reasoned premise)	Unclear in most parts, lack of many augments being tied to an idea (reasoned premise)	Clear in some parts but not overall, some arguments were tied to an idea (reasoned premise)	Mostly clear and orderly presentation and many arguments were tied to an idea (reasoned premise)	Completely clear and orderly presentation and all arguments were tied to an idea (reasoned premise) in a tight logical fashion
2. Presentation Style: tone of voice, use of gestures, and level of enthusiasm are convincing and respectful to the audience.	20	No style features were used. Statements, responses and/or body language was not consistently respectful	Few style features were used; not convincingly. Statements, responses and/or body language was not consistently respectful	Few style features were used but they were used convincingly. Respectful at all times.	All style features were used, most convincingly. Respectful at all times.	All style features were used convincingly. Enthusiasm empathy connection with audience using anecdotes and metaphors. Respectful at all times.
3. Depth of Topic Knowledge Breadth and depth of topic understanding in debate	20	No evidence that they learned / researched the debate topic. No variance in topic knowledge presented.	Little evidence that they learned / researched the debate topic. Little variance in topic knowledge presented.	Varied argument presented based on some evidence of understanding / research of the topic.	Sufficient evidence of knowledge demonstrated by augments and supporting from understanding / research on the topic.	Deep comprehensive understanding of topic evident in many varied arguments, evidence and response.
4. Use of Arguments (rebuttals): Major points are given to support viewpoint with supporting logical reasoning adopting - induction – deduction – equivalency. (responded directly to other team arguments and dealt with effectively)	20	No relevant reasons given. Arguments and their points were irrelevant and/or unclear.	Few relevant reasons given. Arguments and their points were largely irrelevant and/or unclear.	Some relevant reasons given Few convincing arguments and most points were irrelevant and/or unclear	Many reasons given: several convincing arguments and most points were on topic and clear.	Many convincing arguments and all points were on topic and very clear.
5. Use of Examples and Facts: examples and facts are given to support reasoning, with references	20	No relevant supporting examples/facts and no sources	Some relevant supporting examples/facts	Major points adequately supported by examples / facts given with sources	Major points well supported with examples and/or relevant facts / statistics given, with robust and scientific sources	Major points well supported with examples and/or relevant facts / statistics given, with robust and scientific sources
Team Score (25%):						
1. Depth of Topic Knowledge Breadth and depth of topic understanding in debate notes	50	No evidence that they learned / researched the debate topic. No variance in topic knowledge presented.	Little evidence that they learned / researched the debate topic. Little variance in topic knowledge presented.	Varied argument presented based on some evidence of understanding / research of the topic.	Sufficient evidence of knowledge demonstrated by augments and supporting from understanding / research on the topic.	Deep comprehensive understanding of topic evident in many varied arguments, evidence and response.
2. Score from Audience Rating	50		Dissuaded	Neutral	Informed	Persuaded