

Chapter 8

Context-Based Reasoning Problems: Framing and Informal Fallacies

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8.1 Introduction: What is Framing?

The chapters and lectures so far discuss how contextualization can dramatically influence one's ability to reason and decide as well as to evaluate reasoning and decision-making. The discussion breaks contextualization into two components: content and context. The last chapter and lectures focused upon content examining concepts and words to determine how they become imbued with meaning. It explained how the very processes through which concepts and words gain their meaning introduce vagueness and ambiguity. The chapter suggests that vagueness and ambiguity have benefits as well as costs when a creature must make inferences and decisions in a complex, inherently ambiguous, highly variable, and constantly changing perceptual world. The benefits of vagueness emerge as a flexibility in categorizing a highly variable and constantly changing perceptual world. The benefits of ambiguity emerge as an ability to manage ambiguity in the service of cognitive economy. Those benefits are neither universally and perfectly realized nor do they come without costs. The seeds of vagueness and ambiguity remain always, inherent in the very processes and world with which the brain forges meaning. Vagueness and ambiguity can and often do cause difficulties in inferences, formulating and evaluating arguments, making and evaluating decisions, engaging in constructive discussions, and in communicating information. Chapter seven also introduces the tool of definition. Definitions act as a mechanism through which people eliminate some ambiguity and vagueness to better facilitate inference, decision-making, argument and communication. Vagueness and ambiguity arise naturally in thought and communication as well as in the nature of human conceptualization. Thus, one can rarely eliminate ambiguity and vagueness completely, through one can employ definitions to reduce ambiguity and vagueness—reduction, therefore, is often an achievable and productive goal.

This chapter and lectures focus upon the other half of contextualization—context. Specifically, the chapter and lectures discuss framing—how the context in which one reasons and decides and in which one evaluates reasoning and decision-making can dramatically influence one's ability to properly analyze and argue. This introduction discusses framing research in computer science, psychology, and the social sciences. The notion of framing utilized in this course will take elements from research in all of these disciplines. The central idea of the chapter is that framing—context—gives rise to the errors in reasoning and the evaluation of reasoning commonly called informal fallacies.

8.1.a The General Notion of Framing

Researchers across computer science, psychology, and the social sciences approach framing from a common insight:



Framing describes the manner in which features of a situation lead our brain to naturally and unconsciously categorize those situations and understand those situations—in effect, to put that situation, its elements and their composition into a specific context. Thus, framing can render objects, properties, relations, and/or information salient (standout and seem important) and/or render those same objects, properties, relations, and/or information opaque (obscure or apparently irrelevant). Framing causes one to categorize the context of an argument, inference, or decision and results in one employing specific types of inference and decision strategies. Remember the black light tattoo photo from chapter 1, it provides a nice analogy for framing. The tattoo appears quite different in normal vs black light. Colors appear more vibrant (salient); figures become easier to discern. As the lecture and chapter continue we'll see that framing acts to change how one perceives a situation—sometimes to positive, sometimes to negative effect.

8.1.b Two Examples of Context Framing Arguments

To help illustrate how a situation can create a context through which one understands that situation let us consider two examples. We will start with the familiar Monty Hall Problem. We will then turn to the Buddhist Monk problem. In each case we will begin the discussion viewing the problem through one framing—one context—and then we will

present the problem again through a second framing—a second context. In each case, how the problem gets framed dramatically shapes our perception of the problem.

8.1.b.1 The Monty Hall Problem

To help illustrate how context can frame problems or arguments, making them seem more or less difficult to solve or evaluate, let us revisit the Monty Hall problem. The Monty Hall problem originates in 1975 when statistician Steve Selvin formulates and names the Monty Hall problem in two 1975 letters to the editor of the journal *American Statistician*.^{1,2} The Monty Hall problem, recall, asks reasoners to select a strategy to accomplish the goal of winning as much money as possible when repeatedly playing a game. In the game utilizes three boxes, one of which will contain money—say five dollars.

Context Dependent Inferences

The Monty Hall Problem

Box #1


Box #2


Box #3


(A) Always switch
(B) Never switch
(C) It doesn't matter

Animated movie depicting the Monty Hall problem. Click on the diagram to start animation.

The Game: In the game, the player first leaves the room and the game master randomly chooses one of the three boxes, putting a five dollar bill in that randomly chosen box. The player returns to the room and that game master asks the player to pick one of the three boxes. After the player chooses a box, the game can go one of two ways depending upon whether or not the player chooses the box with a five dollar bill. **Scenario one:** The player picks the box with the five dollar bill. If the player picks the box with a five dollar bill, the game master randomly chooses one of the two empty boxes. The game master shows the contents of the empty box, i.e., nothing, to the

player. Once the game master reveals the contents of one of the empty boxes, the game master sets that empty box aside and pushes the remaining two boxes forward. The game master then asks the player the following question: “Do you want to stick with the box you chose, or do you want to switch to the other box?” **Scenario two:** The player picks one of the two empty boxes. If the player chooses an empty box, then the game master takes the other empty box and reveals its contents, i.e., nothing, to the player. Once the game master reveals the contents of the empty box, the game master sets that empty box aside and pushes the remaining two boxes forward. The game master then asks the player the following question: “Do you want to stick with the box you chose, or do you want to switch to the other box?” **The Problem:** Monty Hall problem consists in asking people which strategy would allow the player to win as much money as possible when playing the game many, many times. The three strategies are; (1) always switch boxes, (2) never switch boxes, (3) it doesn't matter since either box is equally good.

In both scenarios the game master frames the final choice so that the player sees two boxes, the player knows the five dollar bill resides in one of the remaining two boxes, and the game master asks the player to choose between the two remaining boxes. As noted in the previous chapter, people tend overwhelmingly to assign a 50-50 probability to each box in the final choice. As a result, people overwhelmingly tend to choose strategy three, saying that neither switching boxes nor keeping their original box will improve their winnings when playing many, many times. In fact, people should adopt the first option and always switch from the box they originally chose to the other remaining box. People find this choice incredibly counterintuitive. However, when choices and outcomes are presented using the diagram below, the advantages of switching often become much clearer.

Thus, the way in which the game master frames the final choice (as one between two boxes) makes the problem more difficult by creating a distorted context for assigning probabilities to the remaining boxes. That is, one considers the final choice as a choice between two boxes when the choice actually is between one's original box and the other two

The Monty Hall Problem

	Don't Switch	Switch
Box 1	\$5	
Box 2		\$5
Box 3		\$5

Diagram depicting the real choice in the Monty Hall Problem: Choose between the contents of the box you choose originally or the contents of the other two boxes.

boxes. As the diagram below illustrates, the game master's framing of the final choice misrepresents the choice and encourages players to assign probabilities to the boxes based upon the two remaining boxes instead of basing their probability estimates upon the original choice between three boxes. The diagram helps to illustrate that in the final choice the players actually choose between the contents of the two boxes not selected initially and the contents of the box initially selected. Thus, the probability of a five dollar bill residing in the remaining box not chosen originally equals two thirds, the probability of the five dollar bill resting in the two boxes not

selected in the original choice.

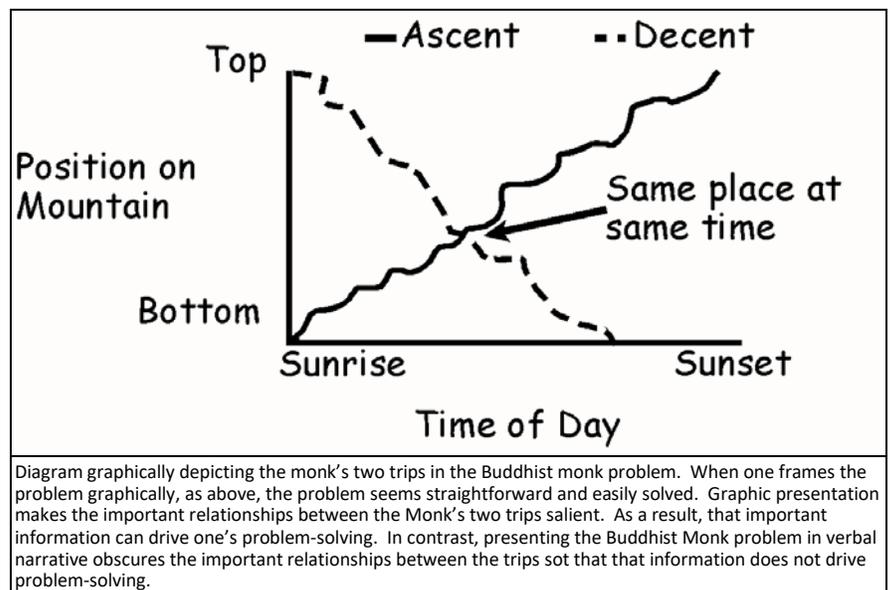
8.1.b.2 The Buddhist Monk Problem

Consider a second problem called the Buddhist Monk problem.

A monk sets out at sunrise to visit a temple at the top of a mountain. He walks all day taking breaks of various lengths randomly throughout the day. He arrives at sunset, spends the day. He sets out for the base of the mountain the next morning. Again, he walks all day taking breaks of various lengths randomly throughout the day, arriving at sunset. Is there some point on the mountain that the monk reached at the same time of day on both trips?

Given in this form, people often respond to the problem by stating that they do not obviously see the solution. Many people cannot solve the problem. However, when one re-frames the problem by graphing the monks travel from dusk to dawn for each trip the solution becomes obvious-- the two lines representing the monks travels must intersect. Therefore, the monk must reach some point on the mountain at the exact same time on both trips.

The Buddhist Monk problem and the Monty Hall problem both illustrate how the situation in which a problem appears can shape its context and thereby determine what objects, properties, relations, and/or information one finds salient (important). Thus, framing can either facilitates or impede one's identification and adoption of a problem-solving or decision-making strategy. As we'll see, framing drives informal fallacies. The manner in which arguer frames the inferences or arguments drives the argument's consumer or creator to formulate or evaluate the argument using an inappropriate inferential strategy or using inappropriate information. Informal fallacies all frame the inference or argument context in a manner that plays upon one's natural native dispositions to categorize and solve problems. Thus, informal fallacies often prove extremely



difficult to avoid. Even when one becomes aware of a given class of informal fallacies, limitations in one's working memory as well as framing pose challenges to one's using that knowledge to improve one's inferences, arguments, or evaluations thereof.

8.1.c Framing in Computer Science

The notion of a frame actually comes from practices in animation. Framing is an animation technique in which the cartoonist superimposes moving scene elements on a scene's "frame", i.e., the unchanging background of the scene. In other words, frames provide a context in which certain elements become highlighted and other elements remain stable or unnoticed. The notion of a frame originally came into the study of thinking and problem-solving through computer science. Specifically, computer scientists John McCarthy and Patrick Hayes coin the notion of a "frame problem," to describe a problem in Artificial Intelligence. McCarthy and Hayes view the frame problem as one of representing a complex, dynamical (changing) domain using logic in such a manner as to avoid explicitly specifying those features unaffected by a given action. McCarthy and Hayes originally outline the problem in their 1969 article entitled, "Some Philosophical Problems from the Standpoint of Artificial Intelligence."³

In short, the frame problem in computer science concerns how best to represent and utilize important information as well as how to discern and adopt the optimal strategy for a given situation. Computer scientists as a result seek to create representations of problems and solutions strategies that correctly identify the relevant details of a particular problem situation and adopt an appropriate solution strategy.

8.1.d Framing in Psychology

Researchers in psychology also think about frame problems, but psychological research adopts a different emphasis. In psychology, researchers focus on what they call "framing effects." A framing effect results from expressing a decision problem using evaluative language--that is language that associates goodness or badness with one or more possible solutions. Psychologists have discovered that people tend to choose options with positive framing, i.e., with positive emotive descriptions. People likewise tend not to choose options with negative framing, i.e., negative emotive meaning. As discussed in previous lectures, social cognition and evaluation as well as risk management rely upon emotive meaning. Thus, some of the first informal fallacies that this chapter and lecture discuss involve framing effects having to do with risk management as well as social cognition.

Research on framing effects dates back at least to a paper published by Amos Tversky and Daniel Kahneman in 1981.^{4,5} As we'll see, while psychologists tend to focus upon decisions in discussing framing effects, framing effects can drive poor argumentation and inferences as well as poor evaluation of argumentation and inferences. Moreover, like most of the effects that we look at, framing effects operate as part of our native inference and decision-making strategies. As a result, even people with PhD's in economics can fall victim to framing effects.⁶ Simon Gächter reports that, "we find that while the behaviour of junior experimental economists is affected by the description of the decision task they face, this is not the case for the more senior members of our subject pool." (p.444)⁶

8.1.e Framing in the Social Sciences

Researchers within the social sciences tend to focus upon communication and how the presentation of an issue, product, etc., works to shape one's perception of the relevant features of a situation or shapes how one interprets the situation. Researchers often trace research on framing in communication to a 1972 paper in a collection of essays by anthropologist Gregory Bateson.⁷ Research on framing, especially in decision and communication continues today. For example, Gergana Nenkov's article, "It's All in the Mindset: Effects of Varying Psychological Distance in Persuasive Messages," discusses the impact of varying psychological distance on framing.⁸ Baden and Lecheler's article, "Fleeting, Fading, or Far-Reaching? A Knowledge-Based Model of the Persistence of Framing Effects," attempts to identify features of a context that affect how long a framing effect will influence people's perception of a given situation.⁹

8.2 Formal Fallacies, Informal Fallacies, and Framing Problems

As we have noted in previous chapters logicians, mathematicians, and philosophers realized thousands of years ago that successful inferences and arguments have two components. Successful inferences and arguments must have good content—they must start with true information. Arguments must have true premises, for example. Successful arguments must also have good logical form—underlying structural relationships between content elements that establish the conclusion given the truth of the premises. Thus, logicians and mathematicians designate deductive arguments with a structure such that whenever their premises are true their conclusion must also be true valid arguments. Valid deductive arguments that also have true premises receive the designation of sound. However, informal fallacies do not fit neatly into these categories. Informal fallacies achieve their impact as much through framing as through logical form and content. As a result, students often have difficulties understanding relationship between informal fallacies and previous discussions of inference and argument that focus exclusively upon logical form and content.

8.2.a Formal Fallacies vs Informal Fallacies

As just noted, the underlying structural relationships between content elements in an argument or inference comprise its logical form. Valid deductive arguments have a structure such that whenever their premises are true their conclusion must also be true. Strong inductive arguments have a structure such that whenever their premises are true their conclusion must be highly likely to be true. Since human beings evolved to solve more concrete problems people often prove relatively insensitive to the underlying structural features of a problem or argument. When this insensitivity to logical form impairs one's ability to formulate or evaluate a deductive argument one can fall victim to a **formal fallacy**. Formal fallacies consist exclusively of invalid deductive arguments. Though formal fallacies might seem like successful arguments, an examination of the logical form of the argument reveals its structural deficiencies.

Like formal fallacies, informal fallacies appear more successful, more convincing that their content and form warrant. Unlike formal fallacies, the source of an informal fallacy's appeal derives from the manner in which the context that frames the fallacy misrepresents the character of the problem. So, framing as understood in this chapter and lectures consists in the impact of the context in which one encounters a choice, inference, or argument upon one's ability to choose, infer, or evaluate that argument. Indeed, some informal fallacies, like begging the question, may involve sound or cogent arguments.

The discussion in the chapter and lectures focuses upon two general patterns exhibited by framing upon problem-solving and reasoning—**schema distortion (SD)** and **content distortion (CD)**. The former cases, SDs, describe situations where the context frames a situation such that one's brain miscategorizes the situation in a manner that leads one to adopt an inappropriate inference or decision-making strategy--either in solving the problem or in evaluating the inference, argument, or decision. Cases of content distortion, CDs, describe situations where the context frames a situation such that irrelevant features of the inference, argument, or decision seem salient (important) or such that important features seem obscure or irrelevant.

8.2.b Schema Distortion

Many informal fallacies affect problem-solving and argument evaluation by framing the problem or argument in a manner that leads our brain to miscategorize the problem or argument as an instance of a different kind of problem or argument. Such framing can lead one to evaluate an argument or attempt to solve a problem using an inappropriate strategy. Indeed, philosophers often group many of the first class of informal fallacies discussed in this chapter and lectures under the category, "fallacies of relevance," because the context of these arguments tends to distort one's perception of the appropriate schema or strategy for solving the problem.

For instance, recall that psychologists identify framing effects as cases where positive or negative descriptions alter one's evaluation of options in decisions. People naturally and innately desire to avoid situations that threaten their well-

being. People prefer choices that allow them to avoid enduring severe pain, for example. The informal fallacy of **Appeal to Force** attempts to illicitly frame a choice or the conclusion of an argument so that one's rejection or acceptance of the choice or argument conclusion becomes associated with something that threatens one's well-being. As a result of the framing, appeal to force fallacies strongly influence people to evaluate arguments or decisions as instances of self-preservation inferences or decisions. For example, consider the flyer below. I received the flyer during the 2012 election. The flyer tries to associate the choice of (vote for) then candidate Alan Lowenthal with a greater likelihood of severe Medicare cuts in the future. However, the "cuts" identified in the flyer were actually savings from cost control measures introduced by Affordable Care Act, also known as "Obama care." Sarah Kliff notes that the "cuts" to Medicare

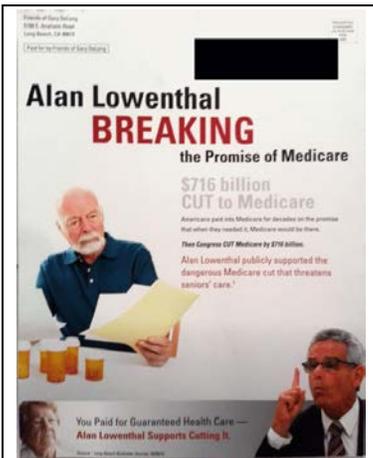


photo of an election flyer framing one candidate, Alan Lowenthal, as someone likely to vote in ways that threaten seniors. (Note: Democrat Lowenthal did receive my vote.)

really consists in projected savings from slowing and/or reducing payments for services to healthcare providers. The law specifies no cuts to benefits.¹⁰ Lowenthal did not vote on the Affordable Care Act as he did not have a seat in the house at that time. Lowenthal did, however, state his support for that legislation during the 2012 campaign. Thus, the flyer commits the fallacy of **appeal to force** by framing the choice between DeLong and Lowenthal as potentially having very negative impacts of senior's healthcare. Were the flyer to make a stronger case for Lowenthal's disposition to actually cut Medicare—say through other votes, public statements, etc.--then the argument might prove legitimate. Lacking a well-evinced connection between Lowenthal's voting record, public statements, etc. and Lowenthal's advocacy of the policy stance of cutting Medicare, the flyer can only influence one's vote through inappropriate framing. That is, the flyer frames the issue of choosing a candidate by assigning an illegitimate negative characterization of Lowenthal's statement and inappropriately implying that Lowenthal poses a potential threat to Medicare.

Textbooks often group fallacies of relevance together because¹¹

...the arguments in which they occur have premises that are *logically* irrelevant to the conclusion. Yet, the premises may appear to be *psychologically* relevant, so the conclusion may *seem* to follow from the premises,.... (p.113)

While such characterizations as the one above reflect part of the reason why informal fallacies prove powerful and intellectually seductive it suffers from two weaknesses. **First**, it does not capture the importance of the interplay between context and native, often quite legitimate, patterns of reasoning. **Second**, it fails to recognize and understand the real limitations one faces when trying to free oneself of informal fallacies. Indeed, as so often noted with regard to reasoning in previous chapters and lectures, many informal fallacies prove difficult to avoid because of limits in one's working memory and because these fallacies trigger native, automatic system 1 inference strategies.

Consider a second example of schema distortion in the informal fallacy called **appeal to the people**. Psychologists have long recognized the influence of social conformity upon judgments and reasoning. The video (right) depicts one famous experiment by S.E. Asch illustrating the influence of the native and



Video depicting the 1951 Asch experiment in which subject judgments prove subject to pressure to conform with opinions expressed by a group. Click on image to start video. From: [Youtube](#)

automatic disposition to conform to the views of a group. Asch, who had been studying perceptual judgments of line length and who had previously studied the effects of group pressure on judgments, asked subjects to identify the longest of three lines.¹²⁻¹⁷ In the experiment the group consists of one subject together with several experimenter confederates (people who play a role in the experiment). The experimenter confederates deliberately misidentify the longest line. Asch reports that the tendency to give the same, albeit erroneous judgment as the confederates appears with just a single subject and a single confederate (3.6% error) and reaches a maximum at a 37.1% error rate when the group has seven confederates and a single subject. (p.35)¹³ Experimental evidence for the impulse towards conformity dates back at least to work by Sherif in the 1930s.¹⁸⁻²⁰ Even today researchers continue to build upon our knowledge how, when, and to what extent conformity can affect judgment and behavior.²¹⁻²³

The informal fallacy of **appeal to the people** exploits this innate disposition to conform to the group by framing a situation such that one erroneously evaluates the argument or inference in light of the irrelevant/inaccurate views of others—adopting a social cognition schema. For example, the following argument commits the fallacy of appeal to the people:

Many recent polls indicate that approximately 90% of Americans support universal background checks for all gun purchases in the United States.²⁴⁻²⁶ Thus, the federal government should pass a law requiring universal background checks.

While I strongly agree with the conclusion of the argument, I nevertheless find it inadequate. The above argument frames the choice regarding legislation exclusively upon the highly evinced fact that an unusually large percentage of Americans support universal background checks at the time of the poll. However, this fact regarding people's opinions—while not irrelevant—signifies very little in light of a long-established understanding of the second amendment as granting the right to own guns. Given the legal precedent of understanding the second amendment as granting a right to own guns, restrictions on gun purchases and ownership must satisfy legal standards for limiting rights. For instance, limits on rights ought to satisfy standards of fair, reasonable, and non-discriminatory practice so that the restrictions place no undue or unfair burden on exercising the right. Information regarding the fairness, reasonableness, and non-discriminatory status of background checks (for instance, they usually take around two minutes) prove far more relevant than public opinion when determining what one ought to legislate. By framing the case for gun-control legislation solely upon the majority opinion of US citizens, the argument commits the fallacy of appeal to the people and encourages people to evaluate the argument using social cognition schemas as opposed to other standards—e.g., legal standards.

8.2.b Content Distortion

Schema distortion works to frame an argument, inference, or decision so that one miscategorizes the problem and applies an inappropriate evaluative or inference strategy—like social cognition strategies as opposed to legal strategies. Content distortion acts to frame situations such that the features of the problem, inference, or argument seem salient (important) or such that important features seem obscure or irrelevant. Often the distortion or altered emphasis causes reasoners to fall victim to weaknesses in their native system 1 reasoning strategies. For example, the informal fallacy of **hasty generalization** can occur when a situation is framed so as to make the size (i.e., a small number of examples) of a sample seem less relevant and the observed value of that sample highly salient. Humans have a strong disposition to generalize from examples to the whole class. Logicians call such inferences inductive generalizations. Such inferences, when well-evinced and strong, prove extremely useful. Unfortunately, the size of the sample class (the evidence) in an inductive generalization strongly affects the strength of that generalization; yet, psychologists have long known that people's generalizations do not show sufficient sensitivity to the size of the sample class. The research on human insensitivity to sample sizes in inductive inferences traces back to Amos Tversky and Daniel Kahneman.^{27, 28} Thus, the fallacy of hasty generalization occurs when the situation's context frames the evidence or argument emphasizing

examples with a common feature and/or deemphasizing the number of those examples. Consider the following argument:

Ted Bundy, Dennis Rader, and Gary Ridgway are all serial killers and Republicans. Thus, all serial killers must be republicans.

One might find the above inference tempting—particularly if one belongs to another political party. Yet, other than a satirical article on Scrape TV claiming that, "[Poll Finds Eighty Percent of Serial Killers Vote Republican](#)," researchers have found little evidence for correlations between political party affiliation and sociopathology.²⁹ While the above serial killers have Republican affiliations, John Wayne Gacy, one of the more of the more infamous serial killers of the 20th century, was notoriously a Democrat. Indeed, Gacy had his picture taken (below) with first lady Rosalynn Carter in 1978. Thus, by framing the argument such that it provides several positive examples of Republican serial killers, the argument makes this information salient so that the natural disposition to generalize works in a manner that does not adequately consider the size of one's sample. As a result, the argument appears stronger than it would otherwise. For instance, suppose that the argument went as follows:

Here are three, well-known serial killers out of hundreds of known serial killers who are also identified as Republicans; Ted Bundy, Dennis Rader, and Gary Ridgway. Thus, all serial killers must be republicans.



Serial killer John Wayne Gacy with first lady Rosalynn Carter. 1978 picture taken when Gacy worked as a Democratic precinct captain. Carter signed the back of the picture. From: [Wikipedia](#)

When one frames the argument such that the size of the sample relative to the whole class becomes salient, then the argument appears much less compelling as an inductive generalization. Consequently, hasty generalization falls into the class of informal fallacies that gain their seeming strength from framing that distorts and/or emphasizes content in a manner that preys upon often legitimate patterns of reasoning. In this case, the framing emphasizes examples that share common properties and deemphasizes the number of examples. This framing then interacts with the reasoner's native inductive dispositions so that the reasoner falls prey to a weakness in people's innate and automatic inductive inference strategies—a relative insensitivity to the relationship between the size of an evidential sample and the strength of the inductive inference. It is the interaction between the framing of the argument and one's innate reasoning dispositions that gives the argument its seeming strength

absent sufficient evidence to support an inductive generalization.

8.3 Summary of Framing and Informal Fallacies

This chapter and lectures outline the notion of framing and how framing can affect one's inferences, arguments, and decisions as well as one's evaluations of inferences, arguments, and decisions. Specifically, the chapter and lecture discuss two ways in which framing can undermine one's inferences and arguments; schema distortion and content distortion. Schema distortion works to frame a situation so that one miscategorizes the nature of the situation and applies an inappropriate evaluative or inference strategy—most often this miscategorization works through System 1, operating automatically, autonomously, and thus with little conscious awareness. Content distortion acts to frame situations such that either irrelevant or misleading features of the situation become salient or such that important features seem obscure or irrelevant.

Traditional critical thinking textbooks rely upon the logician's distinction between form and content in understanding and evaluating inferences and arguments. We have seen how useful these distinctions prove in understanding and evaluating deductive and inductive arguments. However, informal fallacies bring an additional component into play: Informal fallacies involve arguments for which the perception of success or failure of the argument turns, not simply of form and content, but upon the manner in which the context frames the argument. As a result, most critical thinking textbooks tell students that logical form and content exhaustively determine an arguments

success or failure only to tell them that some sound and cogent arguments are nevertheless informal fallacies. By understanding the interplay between logical form, content, and framing students can see how contextualization can alter our perception of an inference, argument, or decision to create a fallacious impression of argument strength disproportionate to the argument's form and content.

The next lectures continue to identify specific informal fallacies with the specific framing patterns and the specific resultant schema distortion or content distortion. Likewise, the presentation of each informal fallacy discusses the underlying inference strategies and how these strategies interact with the framing to give rise both to the informal fallacy as well as its perniciousness and perseverance. The lectures and readings on informal fallacies have two goals: (1) The content acquisition goal of learning and understanding individual fallacies and (2) The skill-based goal of quickly and reliably identifying and categorizing informal fallacies.

8.4 Fallacies of Relevance

The fallacies classified in the average critical thinking textbook as fallacies of relevance really fall under two general categories when it comes to hooks—the manner through which they appear more rhetorically successful than their logical structure merits. First, in many cases framing causes one to miscategorize inferences or arguments as instances of personal risk/reward management and social cognition. Second, other fallacies of relevance result when framing causes content distortion. The former fallacies work by triggering various social cognition inferences. The latter manipulate content to distort one's perception of the argument or its form.

8.4.a Appeal to Force (*Argumentum ad Baculum*)

As with all fallacies of relevance, the “premises” of an appeal to force argument are psychologically relevant, but logically irrelevant. In the case of appeal to force, sometimes called fear mongering, the argument associates acceptance of its conclusion with avoidance of some significant harm, triggering a desire to avoid harm that motivates assent instead of evidential support. The perception of a threat triggers System 1 to categorize the problem as one of risk management. In other words, appeal to force arguments try to motivate assent to their conclusion as a prudent means of avoiding some threat. The argument is fallacious whenever the threat proves irrelevant to the likelihood of the conclusion, does very little to increase the likelihood of the conclusion, or the evidence connecting the threat to the conclusion is non-existent or inadequate. Thus, appeal to force is an instance of schema distortion. The argument or inference illicitly links denial of the conclusion with significant harm, implying that accepting the conclusion will result in avoiding that harm. The argument or inference proves fallacious in so far as the threat really has no factual link to the conclusion. Researchers in the heuristics and biases literature in cognitive science sometimes refer to the influence and potential biases of affective framing as the affect heuristic.³⁰⁻³⁵ Slovic and colleagues describe the operation of the affect heuristic as follows:³⁴

...people judge a risk not only by what they think about it but also by how they feel about it. If their feelings toward an activity are favorable, they tend to judge the risks as low and the benefits as high; if their feelings toward the activity are unfavorable, they tend to make the opposite judgment—high risk and low benefit (i.e., the affect heuristic; Finucane, Alhakami, Slovic, & Johnson, 2000). (p.323)

We noticed how affective framing can influence decisions in the concepts, meaning, and definition chapter. Indeed, persuasive definitions operate to create affective framing. The harm involved in an appeal to force argument may be physical, financial, emotional, mental, social, etc.. The video of President Bush's speech on October 7th 2002 (above) illustrates an appeal to force argument. In effect, Bush argues that the U.S. should attack Iraq **before** we have definitive proof of weapons of mass destruction on the basis of the threat posed by potential nuclear weapons. At that time there was no credible evidence of a nuclear weapons program in Iraq. Thus, reference to the risk of nuclear attack constitutes

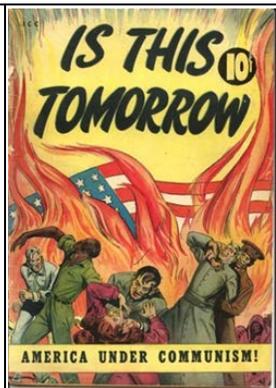


(Left) Video from President George W. Bush's October 7, 2002 speech on Iraq. From: [CSPAN](#) (Right) Video of Donald Trump arguing in 35 seconds and without a single attempt to connect his claims to any facts that if elected Joe Biden will cause a crash in the stock market, double and triple people's taxes, take away people's guns, destroy the second amendment, hurt the bible, hurt God, and that Biden is against energy. From: [The Guardian](#)

an appeal to force argument in which accepting the argument's conclusion that military action is linked to a non-existent threat. Bush's use of the smoking gun/ mushroom cloud argument follows its

original use by Secretary of State Condoleezza Rice on CNN in September 2002. In a similar fashion the Bush administration repeatedly suggested a link between Saddam Hussein and the terrorist organization Al-Qaeda when none existed.³⁶⁻³⁹ At his trial in Nuremberg, Hermann Goering said:

People can always be brought to the bidding of the leaders. That is easy. All you have to do is tell them they are being attacked and denounce the peacemakers for a lack of patriotism and exposing the country to danger. It works the same in any country.



The 2020 election cycle brought many instances of appeals to force. Donald Trump has falsely argued that Joe Biden will destroy the suburbs, ushering in waves of crime and violence by continuing to enforce the 1968 fair housing. In the video above Trump argues in 35 seconds and without a single attempt to connect his claims to any facts that if elected Joe Biden will cause a crash in the stock market, double and triple people's taxes, take away people's guns, destroy the second amendment, hurt the bible, hurt God, and that Biden is against energy. Of course, not all appeals to force come from governments. Anyone can link bad outcomes to rejecting a conclusion. In the video (left) Chris Matthews



(Top Left) 2014 Report originally airing on CBN (The Christian Broadcast Network) suggesting that voter fraud represents a real threat to democracy both in the past and in the future. From: [CBN](#) (Top Right) This cover of a comic book from 1947 suggesting that communism would bring apocalyptic times to the US. From: [Conelrad](#) (Bottom Left) Newscaster Chris Matthews arguing against Bernie Sanders' candidacy by invoking the idea that Sanders might be ideologically aligned with communists who would execute political opponents. From: [Youtube](#)

seems to suggest that Bernie Sanders' self-identification as a social democrat might somehow link him to the worst imaginable human rights violations of Soviet communism. Arthur Allen the CEO of ASG Software Solutions sent an e-mail to his employees before the 2012 election in which he employs an appeal to force argument for voting for Mitt Romney: "If we fail as a nation to make the right choice on November 6th, and we lose our independence as a company,

I don't want to hear any complaints regarding the fallout that will most likely come,..."⁴⁰ Allen links voting for Obama with ominous consequences for his workers, despite a paucity of evidence suggesting that Obama's continued Presidency will result in any "fallout" for ASG software.

The 2014 report (above, left) from the CBN suggests that voter fraud poses a real threat to democracy in the United States. The threat of voter fraud is often offered as a reason why states should pass voter identification laws. The appeal to force, then, is the threat to democratic government which is then used to influence people's choices regarding voter id laws. The argument proves fallacious in that there is no real threat to democracy from voter fraud. The report interviews several people and speculates about the impact of voter fraud on past and future elections. The expert interviewed for the video, Hans Von Spakovsky, runs the highly partisan Heritage Foundation's division attempting to pass strict voter id laws. However, voter fraud is actually well-researched and widely debunked. As the Washington Post's Christopher Ingraham notes, "...there is overwhelming scholarly and legal consensus that voter fraud is vanishingly rare, and in fact non-existent at the levels imagined by voter ID proponents."⁴¹ A number of non-partisan academic studies of voter fraud in the United States have, in fact, found little evidence of any voter fraud.^{42, 43} The cover (above left) of this cold war comic book likewise commits the fallacy of appeal to force in that it not so subtly suggests that communism would bring apocalyptic times to the United States.

Appeals to force appear often in politics perhaps because politicians often run on change and the operations of the government affect everyone. But appeal to force can appear in any context. For instance, appeal to force operates when a boss inappropriately suggests that one's job security or advancement depends upon being receptive to their advances. In every case detecting and diagnosing an appeal to force fallacy involves determining the nature of the threat and the evidence offered in support of the threat occurring, and claim of the relevance of the threat to the conclusion or action and evidence offered in support of that claim. Fallacies of appeal to force tend to offer little if any evidence for the threat they allege. The threats most often have a speculative character, as do the connections between the threat and conclusion; usually little if any legitimate, well-evinced connection exists between the threat and the conclusion. Thus, Trump's claims that Biden will take away your guns or hurt God are pure appeal to force. In contrast, when Dr. Fauci of the CDC tells people that if they do not practice social distancing and wear masks in public they greatly increase the chances that they will contract a deadly virus do not count as appeal to force.

4.4.b Appeal to Compassion (*Argumentum ad Misericordiam*)

Like appeal to force, **appeal to compassion**, most often called appeal to pity, is an instance of schema distortion in which the framing of the context triggers the incorrect use of social cognition reasoning strategies rather than the relevant inference strategies. Part of what the advantage social creatures have lies in their ability to help one another survive and flourish. Indeed, Michael Tomasello and Ivan Gonzalez-Cabrera theorize that:⁴⁴

...species-unique forms of human cooperation, and the underlying psychology supporting them, first emerged in the context of early humans' shift to obligate collaborative foraging. The process very likely began around 2 million years ago with the emergence of the genus *Homo* and was consolidated by around 400,000 years ago with the emergence of *Homo heidelbergensis*....

...all of this got scaled up as modern humans began forming cultural groups beginning some 150,000 years ago. All the members of a modern human cultural group understood themselves to be interdependent with their group mates for survival, including in the context of competition with other groups, and indeed members of other groups were thought of as free riders or competitors not deserving of any of the fruits of their collective labor. In this context, modern humans evolved, cognitively, the ability to create collective, group-minded cultural structures such as linguistic conventions, social norms, and cultural institutions to coordinate and regulate their group life. (p.275-6)

As a result of human and proto-human evolution, therefore, humans have evolved a capacity for cooperative behavior and compassion larger than most animals, but nevertheless very limited. This allows us to do things unheard of the rest of the animal world, like load 300 breeding aged adults into a small aluminum cylinder and transport that cylinder

thousands of feet above the ground for periods of 18 hours without chaos erupting. It also means that humans have evolved to show some degree of compassion towards one another. In fact, studies suggest that people who give time and money to benefit others tend to report higher levels of life satisfaction.^{45, 46} In a more down to earth example, when a homeless person—someone you don't know and will likely never meet again—asks for money, you probably feel a desire to help them—compassion.

However, while cooperative behavior and limited compassion have distinct benefits, they can also be exploited or simply maladaptive. So, giving someone a dollar because they are homeless does nothing to address the root causes of their situation. For instance, the major causes of homelessness in the United States consistently include lack of affordable housing, low-wage jobs, mental illness, substance abuse, domestic violence, etc.. Giving someone a dollar on the street addresses none of these root causes. Homeless people are better served by government and private programs and agencies created to address the specific causes of their current situation.^{47, 48} Thus, the request really serves as an instance of appeal to compassion linking the conclusion that you ought to give the person a dollar with your sense of compassion for their situation, even though your compassion will do little to address their situation.



Sam Witwicky uses an appeal to compassion argument to get an A- on a presentation in the Transformers.

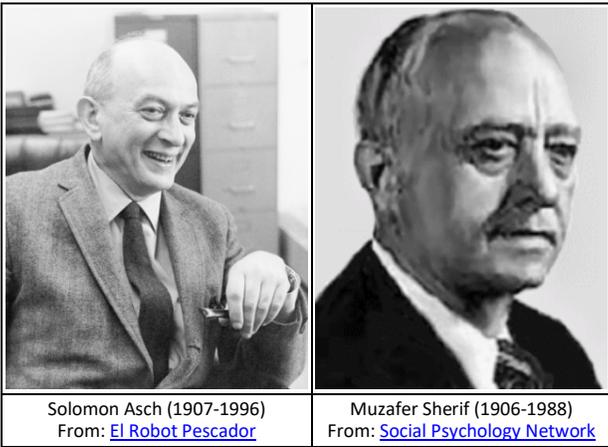
People sometimes allege that grade inflation in universities resulted from another example of appeal to compassion. Though no doubt hyperbolic speculation, the line of reasoning notes that dropping below a C average during the Vietnam War would make a person subject to the draft. If drafted and stationed in Vietnam these lapsed students would face the horrors of that war and possibly their own death. As a result, the suggestion concludes that professors would give often give undeserving male students Cs out of compassion. A similar argument is made by Sam Witwicky to his teacher

regarding his class presentation in the Transformers.

Of course, not all appeals to pity prove fallacious. In some circumstances it is quite legitimate to consider the context and to allow pity to sway one's thinking. For instance, in sentencing guidelines for capital cases there are numerous provisions to mitigate punishment if circumstances warrant tempering punishment out of compassion. In many death penalty states mental impairment or history of abuse are grounds for mitigating punishment. Likewise, the prohibition on cruel and unusual punishment is based upon the notion that even criminals deserve some compassion.^{49, 50} In all cases, one should ask oneself if the feelings of compassion are relevant to the conclusion or merely implicitly or explicitly associated with a conclusion for which it has no legitimate relevance.

8.4.c Appeal to the People (*Argumentum ad Populum*) Direct

As with appeal to pity, the informal fallacy of **appeal to the people** frames an argument or inference so that System 1 categorizes the inference or argument as an instance of social cognition. Again, the reasons offered in support of the conclusion prove psychologically compelling to the argument's consumer, but logically irrelevant. Thus, appeal to the people is an instance of schema distortion in which the framing of the context triggers the incorrect use of social cognition reasoning strategies rather than the relevant inference strategies. By associating the conclusion with the views expressed by the social group, appeal to the people creates a felt need to accept the conclusion out of ideological conformity. Recall from the introductory sections on framing that S.E. Asch conducted an experiment in 1951 illustrating the inordinate effects of group opinions upon individual judgments of relative line length.^{12, 13} The native disposition to conform to the group is part of our System 1 social cognition strategies. But why would we evolve to prioritize conformity over accuracy?! The answer likely consists in the need for harmony and cohesion in social groups. When individuals are constantly disagreeing it becomes very difficult for a group to reach consensus or act. Likewise,



agreeing with others is a means for ingratiating oneself in the social hierarchy. Furthermore, it is easier to know what to expect from people and form trusting relationships when their views agree with your views.⁵¹ These features of social dynamics function to create both a desire to conform to the group as well as a distrust of those whose views differ significantly from one's own. Muzafer Sherif is probably the first experimenter to demonstrate a strong disposition towards conformity in a group setting.^{18-20, 52} For instance, in 1936 Sherif asked subjects to make a judgment about how much a dot of light had moved on a darkened wall during the experiment's interval. The dot actually did not move at all, though

people do perceive movement due to the [autokinetic effect](#).⁵³ However, when the group expressed a certain judgment regarding the movement, individuals tended to conform to that estimate.

In all of the above-mentioned examples the actual presence of a group frames the context such that the opinions of the group affect the reasoner's judgment. Logicians call this form of appeal to the people "direct" because the actual dynamics of the group affect one's judgment. Direct effects explain such phenomena as why political parties still have conventions and why churches still meet each Sunday. When you bring people together and create a group that union greatly increases the power of that group to influence judgment.

8.4.d Appeal to the People Indirect

Creating physical groups of people in order to influence perception and judgment can prove very time-consuming, logistically difficult, and expensive. In many cases, the mere association of a conclusion or choice with either the views of particular people or groups or simply membership in such a group proves sufficient to generate an effect. In appeal to the people indirect the conclusion of an argument or course of action is associated with the views of a particular group. Logicians usually identify three different approaches to appeal to the people indirect. Practitioners of the first approach to indirect appeal to the people frame the context so as to associate the target conclusion or course of action with conformity to the majority. Practitioners of the second approach to indirect appeal to the people frame the context so as to associate the target conclusion or course of action with membership in some particular social group. Practitioners of the third approach to indirect appeal to the people frame the context so as to associate the target conclusion or course of action with possessing properties that people admire or respect. Let's start by discussing the first approach—associating a conclusion or course of action with conformity to the majority.

8.4.d.1 Bandwagon

In **bandwagon**, the arguer frames the context so that the conclusion is presented as the prevailing view of the target community. For example, people will often argue for a conclusion by citing poll numbers showing a majority of Americans favor that conclusion. Often times in the debate over the legitimacy of prayer in schools people will cite poll numbers like 60% to 70% favor prayer in schools. While this information usually reflects current public opinion, public opinion proves largely irrelevant given the constitutional principle of separation of church and state. Moreover, such polls often times misrepresent people's real opinion in that they don't specify the nature of prayer; do people approve of a silent period for prayer, as standardized prayer, etc.. In the case of legislative matters, people often focus upon public opinion on the assumption that majority rules in a democracy. However, the United States constitution carefully specifies a number of safeguards designed to prevent a tyranny of the majority of several basic issues.

The photo (below) from the 2012 Romney campaign shows Mitt Romney speaking to a large crowd and invites the viewer to join. Of course, not all examples of bandwagon come from politics. Advertising often uses bandwagon to promote products. McDonalds signs (below) often include the number served, which in this picture numbers about 14 times the current world population. Similarly, the Nike ad (below) suggests to viewers that "everyone" has Nike



(Above) Picture of Mitt Romney speaking to a large crowd from his campaign website in 2012. (Below, Left) Picture of a McDonalds sign suggesting everyone eats at McDonalds. From: [Scribbling Islette](#) (Below, Right) Nike Ad suggesting everyone owns Nike shoes. From: [Pic-HD](#)



shoes. Social media provides another way to create a context that associates a conclusion or course of action with large numbers of people. For instance, some politicians and entertainment figures have been suspected of padding their Twitter, Instagram, or Facebook followers and using bots to retweet or like their posts.⁵⁴⁻⁵⁶ One type of “spamdexing” manipulates searches to try to effect search engine results thereby affecting results order and trending information.⁵⁷

8.4.d.2 Appeal to Snobbery

In bandwagon the desire to conform to the group exerts an undue influence when the context associates conformity with a specific conclusion or course of action. Another tactic employed in appeal to the people directly associates a conclusion or course of action with a group or groups that have high social standing. The **snobbery** version of the fallacy leverages one’s desire to have a high place in the social hierarchy. The strategy, then, involves creating a context associating acceptance of the conclusion or course of action with membership in a socially desirable or powerful group. The fallacy occurs insofar as the association exerts an undue inferential influence on the reasoner. For example, in the video on the left, Grey Poupon famously associates its product with wealthy people and their tastes. This



The original Grey Poupon commercial associating the mustard with wealthy people and their tastes. From: [Youtube](#)

commercial was incredibly successful in increasing the sales for the company. Likewise, using attractive people to advocate for some conclusion or action exerts an undue influence on the persuasiveness of the message. The effects of attractiveness—sometimes called “the attractiveness bias” or “the halo effect,” were shown in a number of studies beginning in the 1970s. One famous study by Karen Dion and colleagues even had the title, “What is Beautiful is Good”.⁵⁸⁻⁶¹ In other words, people seem inclined to conform to the views espoused and the actions chosen by attractive people in part because they want to be part of that group.

8.4.d.3 Appeal to Vanity

Just as people can find their inferences and decisions unduly influenced by a desire to belong to groups with high social status, people can likewise be biased by the desire to possess properties that other people admire. Thus, while having a super model argue for the empirical validity of the Laffer curve might introduce a fallacy of appeal to the people snobbery, dressing that model in clothes that go on sale next week might lead to appeal to the people vanity. In **appeal to the people vanity** fallacies, the context frames an argument or inference so as to associate acceptance of a conclusion or course of action with possession of a socially desirable property. Thus, athletes promote athletic gear, models promote clothes, rich people promote investment in companies, and so on. In general, vanity involves an association of someone or some group known for having some desirable quality with some conclusion or course of action not significantly related to that quality. For example, Drew Barrymore, Christie Brinkley, Cindy Crawford, Iman, Josie Maran,



Rihanna, and Kat Von D all have their own skin care line despite having no scientific background and not having done any dermatological research. From 1954 until 1999 Philip Morris used the image (above left) of a rugged cowboy smoking their cigarettes—the Marlboro Man—to create an association between their product and handsome, ruggedness. The irrelevance of the association between the qualities of the Marlboro Man and Marlboro cigarettes looms large given that Philip Morris had originally conceived of Marlboro as a filtered cigarette designed to appeal to women with health concerns.⁶² Often times the irrelevance of beauty, wealth, etc. to a given product looms large. The above 2015 ad (center) features model Heidi Klum ostensibly eating a Burger King burger almost as large as her head and unlikely to be on her real-world menu. Klum’s ads, like the Carl’s Junior ads featuring Kate Upton, Hannah Ferguson, and Paris Hilton frame these company’s burgers in a context that associates those burgers with beautiful and sexy women. In 2010 Charmin frames itself in a similar fashion using Kim Kardashian as a spokesperson (above right) including her unveiling a New York public restroom during the Christmas period.

8.4.d.4 Us vs Them

Another way to execute appeal to the people indirect involves manipulating group identity. Everyone identifies themselves with some or other social group. In **us vs them** the context works to associate a conclusion or course of action with membership in a particular social group, usually portraying rejection with membership in another group. Some common groups used in us vs them include generations, religions, ethnicity, sexual orientation, and gender. Archeological evidence for the importance of group identity dates back at least 50,000 years to the emergence of ochre for skin pigmentation and the adoption of body ornamentation. Even today people adopt common modes of dress, consumer products, and body ornamentation to identify with particular groups. However, the influence of group identity can appear in unanticipated ways. For instance, a recent Belgian study suggests that young girls tend to prove more resistant to gender-conformity pressure with regard to academic performance.⁶³ Men, likewise, show an increasing desire for conformity to masculine body images.⁶⁴



(Left) Cartoon depicting Irish people as refusing to assimilate. This cartoon was run next to an editorial arguing against Irish immigration in the 1900s. From: [The Newberry](#) (Center) Undated image of Texas segregation sign in Dimmit, Texas. A system known as "Juan Crow" based upon laws fashioned after Jim Crow laws used signs like this one to enforced racial discrimination against Mexican Americans. From: [Dolph Briscoe Center for American History](#) (Right) Video clip from a speech by Donald Trump on 9/30/2016 discussing the announced US policy on Syrian refugee immigration. From: [The Guardian](#)

Us vs them fallacies have affected immigration discussions not only during the 2016 election cycle, but throughout U.S. history. Such arguments tend to portray immigrant groups as “them” and associate immigration with threats to “us.” In the (above right) video Donald Trump argues against the change in US Syrian refugee immigration policy. A similar use of us vs them figures in the above political cartoon from the 1900s. The cartoon suggests that Irish immigrants resist assimilation—retain the primacy of their ethnic/national origins. The sign (center) from the “Juan Crow” era of Texas.

Despite examples like those just noted, us vs them framing occurs in many situations and in both positive and negative



Top Left: Pepsi commercial airing in 1969. From: [Youtube](#)
 Top Right: Pepsi commercial starring Michael Jackson that aired in 1983. From: [Youtube](#)
 Left: Pepsi commercial for collector's edition Pepsi Perfect that aired in 2015. From: [Youtube](#)

contexts. Pepsi’s ad campaigns tout Pepsi as “the choice of a new generation” thereby employing us vs them framing by suggesting that the majority of young people prefer the taste of Pepsi. The irrelevant nature of the association between a conclusion or course of action (in this case product) and a particular group like a generation becomes obvious when one watches this Pepsi campaign through three different generations. Below are three versions

of this ad campaign. The first ad aired in the 1960s, the second ad aired in 1983, and the third aired in 2015.

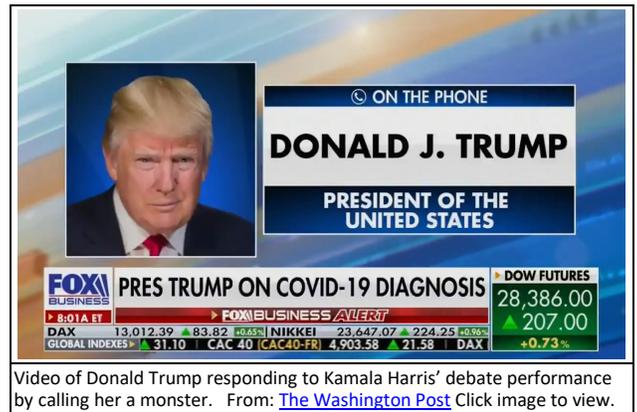
8.4.e Argument Against the Person (Argumentum ad hominem)

In general, an argument against the person fallacy attacks the character (abusive), motives (circumstantial), consistency (tu quoque), or other attribute of a person making an argument (abusive) rather than addressing the person’s argument

directly. Argument against the person seeks to paint an arguer negatively and encourage people to make the association: bad person = bad argument or bad conclusion.

8.4.e.1 Argument Against the Person Abusive

Argument against the person abusive trades upon the notion that bad people cannot be trusted in a wide-ranging and undifferentiated manner. Instead of considering the reasons offered for a view, this argument attacks the arguer. In general, an abusive *ad hominem* will not present evidence of the relevance of the arguer's alleged defect in the evaluation of the argument, nor do abusers tend to specify the bearing of the arguer's alleged defect upon the issue at hand. Abusers often do not even offer evidence in support of their attack, though if it exists they tend to offer it. Rather, the strategy operates by turning attention away from arguments and reasons and towards the arguer. For example, in the video Donald Trump repeatedly labels Kamala Harris a "monster." Trump has a long history of using *ad hominem* abusive arguments, particularly against women.^{65, 66} Indeed, Trump relies so heavily upon *ad hominem* arguments that Wikipedia has a page devoted to the names he uses.⁶⁷



While some cases of personal attack clearly and obviously commit the fallacy of *ad hominem* abusive one must be careful to determine that the attacks do not directly reflect upon the argument or issue at stake before labeling the argument a fallacy. Always assess (1) what is the evidence offered and (2) what connection, if any, exists between the attack on the arguer and the argument or subject at hand. For instance, if the attack provides evidence that questions a person's evaluation of a technical report on the grounds that the person lacks the qualifications necessary to evaluate such technical report, then no fallacy is likely to have been committed. For instance, the O.J. Simpson defense team hired Kary Mullis, the scientist who won a Nobel Prize for his contributions to the development of DNA testing, to evaluate the DNA report in that case. However, the defense team never called Mullis as a witness because the prosecution planned to bring up Mullis' extensive drug use and questionable record of research since winning the Nobel Prize. While Mullis certainly had the technical expertise his professional and personal indiscretions undermined his credibility as a trustworthy expert witness.⁶⁸

8.4.e.2 Argument Against the Person Circumstantial

8.4.e.3 Argument Against the Person Tu quoque (you too)

8.4.f Fallacy of Accident

An arguer commits the fallacy of accident when they misapply a general rule to a specific case in order to derive a conclusion. The argument usually occurs because the cases covered by the rule are superficially similar to the case in the argument. For example, Jayden's mother developed schizophrenia, but Jayden is very unlikely to develop schizophrenia since the odds in the general population of developing schizophrenia are 1 in 10,000. The general rule applies to the "average person." However, since Jayden's mother developed schizophrenia and the disease and it has a strong genetic component, he doesn't fall under the "average person" rule.

8.4.g Straw Man

To commit the straw man fallacy an arguer takes their opponent's argument and distorts the argument in ways that make the argument weaker. The arguer then rebuts the distorted argument and claims to have defeated the original argument. The straw man practitioners often take quotes out of context or incorrectly paraphrase or summarize an

opponent's position. If the distortion of the original argument goes unnoticed, then a straw man argument succeeds in creating the false impression that the original argument has been refuted. For example, during the Democratic debates of 2020 many of the candidates portrayed the single-payer proposals of Elizabeth Warren and Bernie Sanders as destroying the progress made by the ACA and starting from scratch. Sanders and Warren really advocated expanding the existing Medicare program to cover all citizens.⁷⁰

8.4.h Red Herring

An arguer commits the fallacy of accident when they misapply a general rule to a specific case in order to derive a conclusion. The argument usually occurs because the cases covered by the rule are superficially similar to the case in the argument. For example, Jayden's mother developed schizophrenia, but Jayden is very unlikely to develop schizophrenia since the odds in the general population of developing schizophrenia are 1 in 10,000. The general rule applies to the "average person." However, since Jayden's mother developed schizophrenia and the disease and it has a strong genetic component, he doesn't fall under the "average person" rule.

8.4.i Missing the Point/Ignorance of the Refutation (Ignoratio Elenchi)

Aristotle discusses this fallacy in the *Organon*. An arguer commits the fallacy of missing the point when they offer an argument to establish a conclusion that strictly speaking is irrelevant to the point at issue. For example, one might try to establish one's intelligence by demonstrating that a distant relative taught at MIT. An instance of missing the point might be a sound deductive argument. The flaw of a missing the point fallacy consists in its conclusion neither refuting nor confirming the point at issue. Analogously, to avoid falling for a missing the point fallacy one must notice that the argument misunderstands the nature of the debate. Often times such fallacies seem relevant at a superficial level.

8.5 Fallacies of Weak Induction

Only inductive arguments that appear strong despite having weak inductive form count as informal fallacies of weak induction. These fallacies often create the impression of good inductive logical form by exploiting people's tendency to under-utilize facts regarding the reliability and/or predictive value of evidence when making inferences or acting on the basis of that evidence. This category includes hasty generalization, false cause, slippery slope, appeal to unqualified authority, appeal to ignorance, and fallacies of weak analogy.

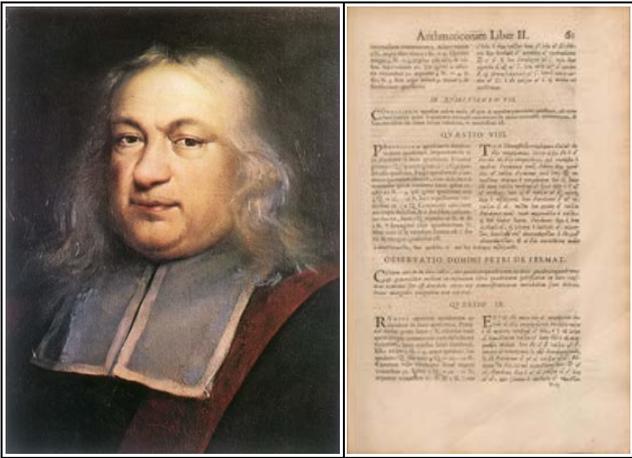
8.5.a Appeal to Unqualified Authority

An authority is a person who because of training, circumstance, or experience has greater knowledge of some topic. For example, doctors are authorities on medical issues. We often cite the opinions of authorities as evidence in an argument since their opinions are more likely to be true than the average person. However, one commits the fallacy of appeal to unqualified authority when we cite the opinions of people who are not actually authorities on the topic of the argument. Appeals to unqualified authority, therefore, take advantage of our tendency to illicitly transfer authority from one context to the next or to accord authority to people based upon superficial trappings. For example, people will believe the "scientific claims" of people in white lab coats more often than people dressed casually.^{71, 72}

8.5.b Appeal to Ignorance

The British Empiricist philosopher John Locke likely coined the name for this fallacy. An appeal to ignorance is not an appeal to an ignorant person, rather it is an inference from a current failure to accomplish goal or to definitively establish something as fact, to an in-principle statement that it cannot be done, proven, should not be believed, etc.. In its simplest form appeal to ignorance asserts either that a proposition is true because it has not yet been definitely proven false or a proposition is false because it has not yet been definitively proven true. The argument starts from a characterization of the current state of the world and extrapolates into the indefinite future.

The difficulty with appeal to ignorance lies in the nature of its evidence; the current state of affairs may or may not



(Above, Left) Pierre de Fermat (1607-1665) From: [Wikipedia](#) The 1670 edition of Diophantus's Arithmetica includes Fermat's commentary, referred to as his "Last Theorem" (Observatio Domini Petri de Fermat), posthumously published by his son. From: [Wikipedia](#)

provide reasoners with a representative sample of how the future might look, but since reasoners cannot sample possible futures the risk of an unrepresentative sample remains high. For instance, arguments that infer something cannot be known based upon long-term careful study by qualified experts using appropriate methodology provide sufficient evidence to render their conclusion probable. However, even in those cases these inferences can go wrong. [Pierre de Fermat](#), who was a lawyer by education and employment, also was a famous 17th century mathematician.⁷³ Fermat made contributions to analytical geometry, calculus, number theory and probability. He tended to report his findings in letters with little to no formal proofs. He, as a result, became embroiled in disputes regarding discoveries with Descartes and Wallis (no relation). His most

infamous contribution bears his name: [Fermat's Last Theorem](#).⁷⁴ Fermat's son found the theorem written in the margin of a book with the note that the margin was too small for the proof. Over the centuries many mathematicians tried to prove Fermat's last theorem, but none succeeded. Many mathematicians inferred that the theorem was not a theorem or could not be proven. However, in 1994 a British mathematician [Andrew Wiles](#) finished his proof of Fermat's last theorem which he published in [1995](#).^{75, 76}

Skeptics of scientific results like evolution or climate change often present appeal to ignorance arguments.

8.5.c Weak Analogy

Weak

8.5.d Hasty Generalization

The fallacy of hasty generalization occurs whenever one makes an inductive generalization based upon insufficient evidence. Inductive generalizations—and hence all hasty generalizations—have a specific form: One observes instances of some class of things (e.x. a sample). Based upon those observations one makes a general inference about the entire class. In other words, one makes an ampliative inference from data about some individuals to a claim about all individuals of that category. For example, one examines a number of humans and notice that each examined human is a mammal. One infers that humans are mammals.

Hasty generalizations occur when one makes an inductive generalization based upon insufficient evidence. Evidence can fail to support an inductive generalization in a number of ways. The sample size can be too small. The sample can be biased (not representative). The sample may include exceptions that get ignored. We fall prey to hasty generalizations in large part because we tend to be relatively insensitive to the quality and size of evidence when making inductive inferences.

8.5.e False Cause

False cause arguments can take two forms. (1) An arguer can infer (conclude) a causal relationship exists based upon inadequate evidence. In these cases the argument's conclusion always asserts a causal relationship. "Therefore, a positive attitude causes good health." Usually, this kind of false cause argument appeals to one of three kinds of evidence. (A) Inferring a causal connection based upon mere temporal succession (post hoc ergo propter hoc). "I turned on the news and my TV stopped working. Clearly watching the news broke my TV." (B) Inferring a causal connection based upon inadequate correlation or anecdotal evidence (non causa pro causa). "Between 2000 and 2009 both the number of people who died from becoming entangled in their bed sheets and per capita cheese consumption increased. Eating more cheese must cause increased risk of bed sheet entanglement." (C) Inferring a single cause for an

event when many factors likely play a causal role (oversimplified cause). “Over 80% of serial killers are men. Being a man causes sociopathy.” (2) The second form of the false cause fallacy invokes a poorly evinced or spurious causal relationship to establish a conclusion. “Eating more cheese causes increased risk of bed sheet entanglement. Therefore, we should impose limits on per person cheese sales.”

8.5.e.1 Temporal Succession (*Post hoc ergo prompter hoc*)

8.5.e.2 Accidental Correlation (*Non causa pro causa*)

8.5.e.3 Oversimplified Cause

8.5.e.4 Slippery Slope

A slippery slope argument relies upon the assertion of an intricate series of connections, often couched as causal or logical connections, for which little or no evidence exists. In general, slippery slope arguments assert that an initial choice of belief often innocuous will trigger a series of events that result in something much more momentous. Slippery slopes arguments can urge adoption of the belief or choice by alleging a chain of events leading to a much more positive outcome. More often, however, slippery slope arguments urge rejection of the belief or choice by alleging chain reactions resulting in much more negative outcomes. Slippery slope arguments become fallacies whenever the asserted connection between the initial belief or choice and final outcome has little or no real evidence.

8.6 Fallacies of Presumption

Informal fallacies that create the illusion of argumentative success by either covertly introducing premises which are as contentious as the conclusion in the context of the argument or covertly excluding relevant information from the premises commit fallacies of presumption. These fallacies all work through content distortion (CD). To wit, content distortion acts to frame situations such that less relevant features of the problem, inference, or argument seem salient (important) or such that important features seem obscure or irrelevant. Often the distortion or altered emphasis causes reasoners to fall victim to weaknesses in their innate System 1 reasoning strategies. Fallacies of presumption include complex question, false dichotomy, suppressed evidence, and begging the question.

8.6.a Complex Question

One commits the fallacy of complex question whenever one asks a question as a means of illicitly introducing a premise in an argument against another person. For example, one might make an accusation in the form of a question: “Why did you cheat on the test?” The question implicitly asserts that you cheated so that any answer to the question either admits to cheating or forces you to defend your innocence. Another strategy asks a question that could have multiple meanings and interprets the answer in the worst light: “Did you hide the letter in this room?” “No.” “So you hid it somewhere else.”

8.6.b False Dichotomy

False dichotomy can prove difficult to detect since it has the same general form as a [disjunctive syllogism](#). Disjunctive syllogisms are valid three line deductive arguments. One premise introduces a disjunctive statement: “**Either** your argument has three lines **or** your argument is not a syllogism.” The second premise denies the truth of one of the possibilities: “Your argument does **not** have three lines.” The conclusion then asserts that the remaining possibility must be true: “Your argument is not a syllogism.” Disjunctive syllogisms have such wide currency that Arthur Conan Doyle has Sherlock Holmes explain the in *The Sign of Four*: “How often have I said to you that when you have eliminated the impossible, whatever remains, however improbable, must be the truth?”

A fallacy of false dichotomy presents the argument’s consumer with a list of possible answers. The argument implicitly or explicitly frames these answers as mutually exclusive and jointly exhaustive. That is, the argument suggests that only one possible answer is correct and no other, un-listed possible answers exist. The argument then eliminates all but one

of the possible answers and concludes that the remaining answer must be correct. False dichotomy becomes an informal fallacy when the list of choices is **not** mutually exclusive and jointly exhaustive. For example, someone might argue as follows: “**Either** you like every song by Iron Butterfly **or** you do not like any song by Iron Butterfly. You said you liked that song from Thor: Ragnarok—‘In-A-Gadda-Da-Vida’ by Iron Butterfly. Thus, you like all the songs by Iron Butterfly such as ‘I’m Right, I’m Wrong.’” Of course, you need not like every song by a band just because you like one of the band’s songs; there are clearly more options than the two listed in the argument.

8.6.c Suppressed Evidence/Incomplete Evidence/Cherry Picking

One commits the fallacy of suppressed evidence whenever one ignores or plays down evidence that contradicts or weakens the case for the conclusion. Though people often deliberately intend to cherry pick, one need not intend to commit this fallacy. For example, confirmation bias can often result in a person presenting an argument listing only evidence that supports the conclusion. One rule for determining if an argument suppresses evidence is to ask if the argument acknowledges easily available evidence that does not support the conclusion. For example, suppose that your boss requires you to write a self-assessment. You may understandably focus on the areas in which you excel and ignore or downplay the areas you need to improve. However, such an assessment would count as a fallacy of suppressed evidence.

8.6.c.1 Neglecting Negative Evidence

8.6.c.2 False Context

8.6.c.3 Temporal Anchoring

8.6.d Begging the Question

An argument commits the fallacy of begging the question whenever one or more of the premises of the argument prove as contentious in the context of the argument as the conclusion itself. For example, one begs the question if one assume the conclusion—usually stated differently—as a premise. One needn’t assume the conclusion to beg the question; one merely needs to assume a premise that the consumer of your argument will find as dubious as the conclusion. For example, suppose that you are trying to get your friend to switch from iPhone to Android and you start by assuming that only stupid people buy iPhones. Your friend will likely find your assumption as contentious as your conclusion and will not find your argument compelling.

Begging the question will only seem compelling, as a result, when the argument masks the contentious nature of the question-begging assumption. Several means of masking the contentious premise occur often enough to warrant names of their own.

8.6.d.1 Implicit Assumption

8.6.d.2 Altered Phraseology

8.6.d.3 Needle in a Haystack

8.7 Fallacies of Ambiguity

Fallacies of ambiguity trade upon ambiguities of meaning in order to give the appearance of establishing their conclusion. In general a fallacy of ambiguity will play slight-of-hand with meaning, substituting one meaning for another at a crucial point in the argument. Since each meaning has legitimacy a reasoner often fails to notice the switch and accepts the conclusion based upon a single meaning.

8.7.a False Equivocation

When an argument implicitly or explicitly trades upon a meaning ambiguity of a word or phrase to seemingly establish the conclusion it commits a fallacy of false equivocation. Because the word or phrase has more than one meaning the consumer of the argument often fails to notice the argument treats falsely both uses as equivalent (having the same meaning). For example, Johnny must not have liked his Christmas present, since he pulled his present from the box and tossed it in the fire. Here the pronoun it is falsely equated with Johnny's present and not the box.

8.7.b Amphiboly

8.7.c Fallacy of Composition

Composition arguments implicitly assume that properties of the parts of a collection or whole are also had by the collection or whole itself. Sometimes that part-whole assumption is true and the argument is perfectly acceptable. For instance, if every brick in this brick wall is red. Thus, the wall is also red. Unfortunately, other times the part-whole assumption proves false resulting in a fallacy of composition. For instance, each brick in the wall of this building could be lifted by a single worker. Thus, the entire wall of this building could be lifted by a single worker. Reasoners often find it difficult to distinguish fallacies of composition from legitimate composition arguments because the part-whole assumption is often implicit in the argument. The ancient Greek philosopher Aristotle distinguished similar fallacies of composition and division of words in his work, *On Sophistical Refutations*. Aristotle characterized these fallacies linguistically as stemming from the meanings of combinations of words and the conversely on changes in meaning when one divides phrases. Aristotle might be why people sometimes group these as fallacies of grammatical analogy. More contemporary versions locate the flaws in these fallacies in their often implicit assumptions about part/whole relationships. Thus, logicians often group fallacies of composition and division together as fallacies of illicit transference.

Though Aristotle identifies and characterizes these fallacies, he also appears to commit the fallacy of composition in Book I of his *Nicomachean Ethics*:

...all things that have a function or activity, the good and the 'well' is thought to reside in the function, so would it seem to be for man, if he has a function. Have the carpenter, then, and the tanner certain functions or activities, and has man none? Is he born without a function? Or as eye, hand, foot, and in general each of the parts evidently has a function, may one lay it down that man similarly has a function apart from all these?

4.7.d Fallacy of Division

Division arguments implicitly assume that properties of a collection or whole are also had by the parts of that collection or whole. Sometimes that whole-part assumption is true and the argument is perfectly acceptable. For instance, my body is traveling at 55 miles an hour. Thus, every cell in my body is traveling at 55 miles an hour. Unfortunately, other times the whole-part assumption proves false resulting in a fallacy of composition. For instance, I am a living human being. Thus, every molecule of my body is also a living human being. Reasoners often find it difficult to distinguish fallacies of division from legitimate division arguments because the whole-part assumption is often implicit in the argument.

8.8 Some Key Terms

Frame

Framing Effect

Appeal to Force: The informal fallacy of Appeal to Force attempts to illicitly frame a choice or the conclusion of an argument so that one's rejection or acceptance of the choice or argument conclusion becomes associated with something that threatens one's well-being. Thus, the context in appeal to force fallacies causes one's choice to accept or reject the conclusion based (at least in part) upon the threat of force instead of the conclusion's likely truth given the

evidence. Threats involved in appeal to force can take explicit, overt form or can be implicit and/in the context. Likewise, threats can bear upon one's physical well-being or upon one's psychological well-being.

Content Distortion: Content Distortions (CD) are a form of framing effect. CDs occur in situations where the context frames a situation such that: (1) irrelevant or less relevant features of the problem, inference, argument or decision gain salience (seem more important) than appropriate from a logical perspective or (2) important features of the problem, inference, argument or decision lose salience (become less important) than appropriate from a logical perspective. In other words, the context distorts one's perception of the information available in the context impeding problem-solving. For example, in **false dichotomy** the context acts to distort a reasoner's perception of number and nature of solutions to a problem thereby making some solutions salient and rendering the others solutions obscure.

Social Cognition: Social cognition is an area of cognitive psychology and cognitive science that focuses on inferential and decision processes that guide our interactions with humans and some other animals. This text emphasizes the potential conflicts between social goals like ideological cohesion (common beliefs), social structure, group coordination, and reproduction with inferential and decision-making goals like truth. For instance, in the fallacy of appeal to unqualified authority social perception of an individual's authority influences the evidential weight one assigns to their pronouncements—even when the individual's authority is irrelevant to the evidential weight of their pronouncements. Thus, people will often believe the "scientific" pronouncements of obviously unqualified people when dressed in lab coats.

Strategy Distortion: Strategy distortions (SD) are a form of framing effect. SDs occur in situations where the context frames a situation such that one's brain miscategorizes the situation in a manner that leads one to adopt an inappropriate inference strategy, either solving the problem or in evaluating the inference or argument. For example, in bandwagon versions of appeal to the people information about the prevalence of a belief causes one's brain to adopt the social cognition strategy of acceptance or acquiescence to the belief regardless of the evidential merits of the belief.

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