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Improve your time & pressure management skillsLearn in the language you are most comfortable with. Choose from any of our 8 languagesAIR 1|Delhi Judicial 2024Start your learning journey now!LearnPracticeImproveSucceed Kirsten DeVries Questions are at the core of arguments. What matters is not just that you believe that what you have to say is true, but that you give others viable reasons to believe it as welland also show them that you have considered the issue from multiple angles. To do that, build your argument out of the answers to the five questions a rational reader will expect answers to. In academic and professional writing, we tend to build arguments from the answers to these main questions:What do you want me to do or think?Why should I do or think that?How do I know that what you say is true?Why should I accept the reasons that support your claim?What about this other idea, fact, or consideration?How should you present your argument?When you ask people to do or think something they otherwise would not, they quite naturally want to know why they should do so. In fact, people tend to ask the same questions. As you make a reasonable argument, you anticipate and respond to readers questions with a particular part of argument:1. The answer toWhat do you want me to do or think?is yourconclusion: I conclude that you should do or think X.2. The answer toWhy should I do or think that?states yourpremise: You should do or think X because . . .3. The answer toHow do I know that what you say is true?presents yoursupport: You can believe my reasons because they are supported by these facts . . .4. The answer toWhy should I accept that your reasons support your claim?states your general principle of reasoning, called awarrant: My specific reason supports my specific claim because whenever this general condition is true, we can generally draw a conclusion like mine.5. The answer toWhat about this other idea, fact, or conclusion?acknowledgesthat your readers might see things differently and thenrespondsto theircounterarguments.6. The answer toHow should you present your argument?leads to thepoint of view,organization, andtonethat you should use when making your arguments.As you have noticed, the answers to these questions involve knowing the particular vocabulary about argument because these terms refer to specific parts of an argument. The remainder of this section will cover the terms referred to in the questions listed above as well as others that will help you better understand the building blocks of argument.What Is a Conclusion, and What Is a Premise?The root notion of an argument is that it convinces us that something is true. What we are being convinced of is theconclusion. An example would be this claim:Littering is harmful.A reason for this conclusion is called thepremise. Typically, a conclusion will be supported by two or morepremises. Both premises and conclusions arestatements. Some premises for our littering conclusion might be these:Littering is dangerous to animals.Littering is dangerous to humans.Thus, to be clear, understand that an argument asserts that the writers claim is true intwomain parts: thepremisesof the argument exist to show that theconclusion is true.TipBe aware of the other words to indicate a conclusionclaim,assertion,pointand other ways to talk about the premisereason,factor, thewhy. Also, do not confuse this use of the word conclusion with a conclusion paragraph for an essay. What Is a Statement?Astatementis a type of sentence that can be true or false and corresponds to the grammatical category of adeclarative sentence. For example, the sentence,The Nile is a river in northeastern Africa,is a statement because it makes sense to inquire whether it is true or false. (In this case, it happens to be true.) However, a sentence is still a statement, even if it is false. For example, the sentence,The Yangtze is a river in Japan,is still a statement; it is just a false statement (the Yangtze River is in China). In contrast, none of the following sentences are statements:Please help yourself to more casserole.Dont tell your mother about the surprise.Do you like Vietnamese pho?None of these sentences are statements because it does not make sense to ask whether those sentences are true or false; rather, they are a request, a command, and a question, respectively. Make sure to remember the difference between sentences that are declarative statements and sentences that are notbecause arguments depend on declarative statements.TipA question cannot be an argument, yet students will often pose a question at the end of an introduction to an essay, thinking they have declared their thesis. They have not. If, however, they answer that question (conclusion) and give some reasons for that answer (premises), they then have the components necessary for both an argument and a declarative statement of that argument (thesis). To reiterate: All arguments are composed of premises and conclusions, both of which are types of statements. The premises of the argument provide reasons for thinking that the conclusion is true. Arguments typically involve more than one premise.First published Fri Jul 16, 2021 An argument can be defined as a complex symbolic structure where someparts, known as the premises, offer support to another part, theconclusion. Alternatively, an argument can be viewed as a complexspeech act consisting of one or more acts of premising (which assertpropositions in favor of the conclusion), an act of concluding, and astated or implicit marker (hence,therefore) that indicates that the conclusion followsfrom the premises (Hitchcock 2007).[1] The relation of support between premises and conclusion can be cashedout in different ways: the premises may guarantee the truth of theconclusion, or make its truth more probable; the premises may implythe conclusion; the premises may make the conclusion more acceptable(or assertible). For theoretical purposes, arguments may be considered as freestandingentities, abstracted from their contexts of use in actual humanactivities. But depending on ones explanatory goals, there isalso much to be gained from considering arguments as they in factoccur in human communicative practices. The term generally used forinstances of exchange of arguments is argumentation. In whatfollows, the convention of using argument to refer tostructures of premises and conclusion, and argumentationto refer to human practices and activities where arguments occur ascommunicative actions will be adopted. Argumentation can be defined as the communicative activity ofproducing and exchanging reasons in order to support claims ordefend/challenge positions, especially in situations of doubt ordisagreement (Lewiski & Mohammed 2016). It is arguably bestconceived as a kind of dialogue, even if one can alsoargue with oneself, in long speeches or in writing (inarticles or books) for an intended but silent audience, or in groupsrather than in dyads (Lewiski & Aakhus 2014). Butargumentation is a special kind of dialogue: indeed, most ofthe dialogues we engage in are not instances of argumentation, forexample when asking someone if they know what time it is, or whensomeone shares details about their vacation. Argumentation only occurswhen, upon making a claim, someone receives a request for furthersupport for the claim in the form of reasons, or estimates herselfthat further justification is required (Jackson & Jacobs 1980;Jackson, 2019). In such cases, dialogues of giving and askingfor reasons ensue (Brandom, 1994; Bermejo Luque 2011). Sincemost of what we know we learn from others, argumentation seems to bean important mechanism to filter the information we receive, insteadof accepting what others tell us uncritically (Sperber,Clment, et al. 2010). The study of arguments and argumentation is also closely connected tothe study of reasoning, understood as the process of reachingconclusions on the basis of careful, reflective consideration of theavailable information, i.e., by an examination of reasons.According to a widespread view, reasoning and argumentation arerelated (as both concern reasons) but fundamentally differentphenomena: reasoning would belong to the mental realm ofthinkingan individual inferring new information from theavailable information by means of careful consideration ofreasonswhereas argumentation would belong to the public realmof the exchange of reasons, expressed in language or othersymbolic media and intended for an audience. However, a number ofauthors have argued for a different view, namely that reasoning andargumentation are in fact two sides of the same coin, and that what isknown as reasoning is by and large the internalization of practices ofargumentation (MacKenzie 1989; Mercier & Sperber 2017; Mercier2018). For the purposes of this entry, we can assume a closeconnection between reasoning and argumentation so that relevantresearch on reasoning can be suitably included in the discussions tocome. 2. Types of Arguments Arguments come in many kinds. In some of them, the truth of thepremises is supposed to guarantee the truth of the conclusion, andthese are known as deductive arguments. In others, the truthof the premises should make the truth of the conclusion more likelywhile not ensuring complete certainty; two well-known classes of sucharguments are inductive and abductive arguments (adistinction introduced by Peirce, see entry on C.S. Peirce). Unlike deduction, induction and abduction are thought to beampliative: the conclusion goes beyond what is (logically) containedin the premises. Moreover, a type of argument that featuresprominently across different philosophical traditions, and yet doesnot fit neatly into any of the categories so far discussed, areanalogical arguments. In this section, these four kinds ofarguments are presented. The section closes with a discussion offallacious arguments, that is, arguments that seem legitimate andgood, but in fact are not.[2] 2.1 Deduction Valid deductive arguments are those where the truth of the premisesnecessitates the truth of the conclusion: the conclusion cannotbut be true if the premises are true. Arguments having thisproperty are said to be deductively valid. A valid argumentwhose premises are also true is said to be sound. Examples ofvalid deductive arguments are the familiar syllogisms, such as: All humans are living beings. All living beings are mortal. Therefore, all humans are mortal.In a deductively valid argument, the conclusion will be true inall situations where the premises are true, with noexceptions. A slightly more technical gloss of this idea goes asfollows: in all possible worlds where the premises hold, theconclusion will also hold. This means that, if I know the premises ofa deductively valid argument to be true of a given situation, then Ican conclude with absolute certainty that the conclusion is also trueof that situation. An important property typically associated withdeductive arguments (but with exceptions, such as in relevant logic),and which differentiates them from inductive and abductive arguments,is the property of monotonicity: if premises A andB deductively imply conclusion C, then the addition ofany arbitrary premise D will not invalidate the argument. Inother words, if the argument A and B; thereforeC is deductively valid, then the argumentA, B and D; therefore C isequally deductively valid. Deductive arguments are the objects of study of familiar logicalsystems such as (classical) propositional and predicate logic, as wellas of subclassical systems such as intuitionistic and relevant logics(although in relevant logic the property of monotonicity does nothold, as it may lead to violations of criteria of relevance betweenpremises and conclusionsee entry on relevance logic). In each of these systems, the relation of logical consequence inquestion satisfies the property of necessary truth-preservation (seeentry on logical consequence). This is not surprising, as these systems were originally designed tocapture arguments of a very specific kind, namelymathematical arguments (proofs), in the pioneering work ofFrege, Russell, Hilbert, Gentzen, and others. Following a paradigmestablished in ancient Greek mathematics and famously captured inEuclids Elements, argumentative steps in mathematicalproofs (in this tradition at least) must have the property ofnecessary truth preservation (Netz 1999). This paradigm remainedinfluential for millennia, and still codifies what can be described asthe classical conception of mathematical proof (DutilhNovaes 2020a), even if practices of proof are ultimately also quitediverse. (In fact, there is much more to argumentation in mathematicsthan just deductive argumentation [Aberdein & Dove 2013].) However, a number of philosophers have argued that deductive validityand necessary truth preservation in fact come apart. Some have reachedthis conclusion motivated by the familiar logical paradoxes such asthe Liar or Currys paradox (Beall 2009; Field 2008; see entrieson the Liar paradox and on Currys paradox). Others have defended the idea that there are such things ascontingent logical truths (Kaplan 1989; Nelson & Zalta2012), which thus challenge the idea of necessary truth preservation.It has also been suggested that what is preserved in the transitionfrom premises to conclusions in deductive arguments is in factwarrant or assertibility rather than truth (Restall 2004).Yet others, such as proponents of preservationist approaches toparaconsistent logic, posit that what is preserved by the deductiveconsequence relation is the coherence, or incoherence, of a set ofpremises (Schotch, Brown, & Jennings 2009; see entry on paraconsistent logic). Nevertheless, it is fair to say that the view that deductive validityis to be understood primarily in terms of necessary truth preservationis still the received view. Relatedly, there are a number of pressing philosophical issuespertaining to the justification of deduction, such as the exact natureof the necessity involved in deduction (metaphysical, logical,linguistic, epistemic; Shapiro 2005), and the possibility of offeringa non-circular foundation for deduction (Dummett 1978). Furthermore,it is often remarked that the fact that a deductive argument is notampliative may entail that it cannot be informative, which in turnwould mean that its usefulness is quite limited; this problem has beendescribed as the scandal of deduction (Sequoiah-Grayson2008). Be that as it may, deductive arguments have occupied a special placein philosophy and the sciences, ever since Aristotle presented thefirst fully-fledged theory of deductive argumentation and reasoning inthe Prior Analytics (and the corresponding theory ofscientific demonstration in the Posterior Analytics; see Historical Supplement). The fascination for deductive arguments is understandable, giventheir allure of certainty and indubitability. The moregeometrico (a phrase introduced by Spinoza to describe theargumentative structure of his Ethics as following ageometrical stylesee entry on Spinoza) has been influential in many fields other than mathematics. However,the focus on deductive arguments at the expense of other types ofarguments has arguably skewed investigations on argument andargumentation too much in one specific direction (see (Bermejo-Luque2020) for a critique of deductivism in the study ofargumentation). In recent decades, the view that everyday reasoning and argumentationby and large do not follow the canons of deductive argumentation hasbeen gaining traction. In psychology of reasoning, Oaksford and Chaterwere the first to argue already in the 1980s that human reasoningin the wild is essentially probabilistic, following thebasic canons of Bayesian probabilities (Oaksford & Chater 2018;Elqayam 2018; see section 5.3 below). Computer scientists and artificial intelligence researchershave also developed a strong interest in non-monotonic reasoning andargumentation (Reiter 1980), recognizing that, outside specificscientific contexts, human reasoning tends to be deeplydefeasible (Pollock 1987; see entries on non-monotonic logic and defeasible reasoning). Thus seen, deductive argumentation might be considered as theexception rather than the rule in human argumentative practices takenas a whole (Dutilh Novaes 2020a). But there are others, especiallyphilosophers, who still maintain that the use of deductive reasoningand argumentation is widespread and extends beyond niches ofspecialists (Shapiro 2014; Williamson 2018). 2.2 Induction Inductive arguments are arguments where observations about pastinstances and regularities lead to conclusions about future instancesand general principles. For example, the observation that the sun hasrisen in the east every single day until now leads to the conclusionthat it will rise in the east tomorrow, and to the general principlethe sun always rises in the east. Generally speaking,inductive arguments are based on statistical frequencies, which thenlead to generalizations beyond the sample of cases initially underconsideration: from the observed to the unobserved. In a good, i.e.,cogent, inductive argument, the truth of the premisesprovides some degree of support for the truth of the conclusion. Incontrast with a deductively valid argument, in an inductive argumentthe degree of support will never be maximal, as there is always thepossibility of the conclusion being false given the truth of thepremises. A gloss in terms of possible worlds might be that, while ina deductively valid argument the conclusion will hold in all possibleworlds where the premises hold, in a good inductive argument theconclusion will hold in a significant proportion of the possibleworlds where the premises hold. The proportion of such worlds may givea measure of the strength of support of the premises for theconclusion (see entry on inductive logic). Inductive arguments have been recognized and used in science andelsewhere for millennia. The concept of induction (epagoge inGreek) was understood by Aristotle as a progression from particularsto a universal, and figured prominently both in his conception of thescientific method and in dialectical practices (see entry on Aristotles logic, section 3.1). However, a deductivist conception of the scientific method remainedoverall more influential in Aristotelian traditions, inspired by thetheory of scientific demonstration of the PosteriorAnalytics. It is only with the so-called scientificrevolution of the early modern period that experiments andobservation of individual cases became one of the pillars ofscientific methodology, a transition that is strongly associated withthe figure of Francis Bacon (15611626; see entry on Francis Bacon). Inductive inferences/arguments are ubiquitous both in science and ineveryday life, and for the most part quite reliable. The functioningof the world around us seems to display a fair amount of statisticalregularity, and this is referred to as the UniformityPrinciple in the literature on the problem of induction (to bediscussed shortly). Moreover, it has been argued that generalizingfrom previously observed frequencies is the most basic principle ofhuman cognition (Clark 2016). However, it has long been recognized that inductiveinferences/arguments are not unproblematic. Hume famously offered thefirst influential formulation of what became known as theproblem of induction in his Treatise of Human Nature(see entries on David Hume and on the problem of induction; Howson 2000). Hume raises the question of what grounds thecorrectness of inductive inferences/arguments, and posits that theremust be an argument establishing the validity of the UniformityPrinciple for inductive inferences to be truly justified. He goes onto argue that this argument cannot be deductive, as it is notinconceivable that the course of nature may change. But it cannot beprobable either, as probable arguments already presuppose the validityof the Uniformity Principle; circularity would ensue. Since these arethe only two options, he concludes that the Uniformity Principlecannot be established by rational argument, and hence that inductioncannot be justified. A more recent influential critique of inductive arguments is the oneoffered in (Harman 1965). Harman argues that either enumerativeinduction is not always warranted, or it is always warranted butconstitutes an uninteresting special case of the more general categoryof inference to the best explanation (see next section). The upshot isthat, for Harman, induction should not be considered a warranted formof inference in its own right. Given the centrality of induction for scientific practice, there havebeen numerous attempts to respond to the critics of induction, withvarious degrees of success. Among those, an influential recentresponse to the problem of induction is Nortons material theoryof induction (Norton 2003). But the problem has not preventedscientists and laypeople alike from continuing to use inductionwidely. More recently, the use of statistical frequencies for socialcategories to draw conclusions about specific individuals has become amatter of contention, both at the individual level (see entry on implicit bias) and at the institutional level (e.g., the use of predictivealgorithms for law enforcement [Jorgensen Bolinger 2021]). Thesedebates can be seen as reoccurrences of Humes problem ofinduction, now in the domain of social rather than of naturalphenomena. 2.3 Abduction An abductive argument is one where, from the observation of a fewrelevant facts, a conclusion is drawn as to what could possiblyexplain the occurrence of these facts (see entry on abduction). Abduction is widely thought to be ubiquitous both in science and ineveryday life, as well as in other specific domains such as the law,medical diagnosis, and explainable artificial intelligence (Josephson& Josephson 1994). Indeed, a good example of abduction is theclosing argument by a prosecutor in a court of law who, aftersummarizing the available evidence, concludes that the most plausibleexplanation for it is that the defendant must have committed the crimethey are accused of. Like induction, and unlike deduction, abduction is not necessarilytruth-preserving: in the example above, it is still possible that thedefendant is not guilty after all, and that some other, unexpectedphenomena caused the evidence to emerge. But abduction issignificantly different from induction in that it does not onlyconcern the generalization of prior observation for prediction (thoughit may also involve statistical data): rather, abduction is oftenbackward-looking in that it seeks to explain something that hasalready happened. The key notion is that of bringing togetherapparently independent phenomena or events as explanatorily and/orcausally connected to each other, something that is absent from apurely inductive argument that only appeals to observed frequencies.Cognitively, abduction taps into the well-known human tendency to seek(causal) explanations for phenomena (Keil 2006). As noted, deduction and induction have been recognized as importantclasses of arguments for millennia; the concept of abduction is bycomparison a latecomer. It is important to notice though thatexplanatory arguments as such are not latecomers; indeed,Aristotles very conception of scientific demonstration is basedon the concept of explaining causes (see entry on Aristotle). What is recent is the conceptualization of abduction as a specialclass of arguments, and the term itself. The term was introduced byPeirce as a third class of inferences distinct from deduction andinduction: for Peirce, abduction is understood as the process offorming explanatory hypotheses, thus leading to new ideas and concepts(whereas for him deduction and induction could not lead to new ideasor theories; see the entry on Peirce). Thus seen,abduction pertains to contexts of discovery, in which case itis not clear that it corresponds to instances of arguments, properlyspeaking. In its modern meaning, however, abduction pertains tocontexts of justification, and thus to speak of abductivearguments becomes appropriate. An abductive argument is now typicallyunderstood as an inference to the best explanation (Lipton1971 [2003]), although some authors contend that there are goodreasons to distinguish the two concepts (Campos 2011). While the main ideas behind abduction may seem simple enough, cashingout more precisely how exactly abduction works is a complex matter(see entry on abduction). Moreover, it is not clear that abductive arguments are always or evengenerally reliable and cogent. Humans seem to have a tendency tooovershoot in their quest for causal explanations, and often look forsimplicity where there is none to be found (Lombrozo 2007; but seeSober 2015 on the significance of parsimony in scientific reasoning).There are also a number of philosophical worries pertaining to thejustification of abduction, especially in scientific contexts; oneinfluential critique of abduction/inference to the best explanation isthe one articulated by van Fraassen (Fraassen 1989). A frequentconcern pertains to the connection between explanatory superiority andtruth: are we entitled to conclude that the conclusion of an abductiveargument is true solely on the basis of it being a good (or even thebest) explanation for the phenomena in question? It seems that noamount of philosophical a priori theorizing will provide justificationfor the leap from explanatory superiority to truth. Instead, defendersof abduction tend to offer empirical arguments showing that abductiontends to be a reliable rule of inference. In this sense, abduction andinduction are comparable: they are widely used, grounded in very basichuman cognitive tendencies, but they give rise to a number ofdifficult philosophical problems. 2.4 Analogy Arguments by analogy are based on the idea that, if two things aresimilar, what is true of one of them is likely to be true of the otheras well (see entry on analogy and analogical reasoning). Analogical arguments are widely used across different domains ofhuman activity, for example in legal contexts (see entry on precedent and analogy in legal reasoning). As an example, take an argument for the wrongness of farmingnon-human animals for food consumption: if an alien species farmedhumans for food, that would be wrong; so, by analogy, it is wrong forus humans to farm non-human animals for food. The general idea iscaptured in the following schema (adapted from the entry on analogy and analogical reasoning; S is the source domain and T the target domain of theanalogy): S is similar to T in certain (known) respects. S has some further feature Q. Therefore, T also has the feature Q, or somefeature Q* similar to Q.The first premise establishes the analogy between two situations,objects, phenomena etc. The second premise states that the sourcedomain has a given property. The conclusion is then that the targetdomain also has this property, or a suitable counterpart thereof.While informative, this schema does not differentiate between good andbad analogical arguments, and so does not offer much by way ofexplaining what grounds (good) analogical arguments. Indeed,contentious cases usually pertain to premise 1, and in particular towhether S and T are sufficiently similar in a way thatis relevant for having or not having feature Q. Analogical arguments are widely present in all known philosophicaltraditions, including three major ancient traditions: Greek, Chinese,and Indian (see Historical Supplement). Analogies abound in ancient Greek philosophical texts, for example inPlatos dialogues. In the Gorgias, for instance, theknack of rhetoric is compared to pastry-bakingseductive butultimately unhealthywhereas philosophy would correspond tomedicinepotentially painful and unpleasant but good for thesoul/body (Irani 2017). Aristotle discussed analogy extensively in thePrior Analytics and in the Topics (see section 3.2 of the entry on analogy and analogical reasoning). In ancient Chinese philosophy, analogy occupies a very prominentposition; indeed, it is perhaps the main form of argumentation forChinese thinkers. Mohist thinkers were particularly interested inanalogical arguments (see entries on logic and language in early Chinese philosophy, Mohism and the Mohist canons). In the Latin medieval tradition too analogy received sustainedattention, in particular in the domains of logic, theology andmetaphysics (see entry on medieval theories of analogy). Analogical arguments continue to occupy a central position inphilosophical discussions, and a number of the most prominentphilosophical arguments of the last decades are analogical arguments,e.g., Jarvis Thomsons violinist argument purportedly showingthe permissibility of abortion (Thomson 1971), and SearlesChinese Room argument purportedly showing that computers cannotdisplay real understanding (see entry on the Chinese Room argument). (Notice that these two arguments are often described as thoughtexperiments [see entry on thought experiments], but thought experiments are often based on analogical principles whenseeking to make a point that transcends the thought experiment assuch.) The Achilles heel of analogical arguments can beillustrated by these two examples: both arguments have been criticizedon the grounds that the purported similarity between the source andthe target domains is not sufficient to extrapolate the property ofthe source domain (the permissibility of disconnecting from theviolinist; the absence of understanding in the Chinese room) to thetarget domain (abortion; digital computers and artificialintelligence). In sum, while analogical arguments in general perhaps confer a lesserdegree of conviction than the other three kinds of argumentsdiscussed, they are widely used both in professional circles and ineveryday life. They have rightly attracted a fair amount of attentionfrom scholars in different disciplines, and remain an important objectof study (see entry on analogy and analogical reasoning). 2.5 Fallacies One of the most extensively studied types of arguments throughout thecenturies are, perhaps surprisingly, arguments that appear legitimatebut are not, known as fallacious arguments.From early on, the investigation of such arguments occupied aprominent position in Aristotelian logical traditions, inspired inparticular by his book Sophistical Refutations(see Historical Supplement). The thought is that, to argue well, it is not sufficient to be ableto produce and recognize good arguments; it is equally (or perhapseven more) important to be able to recognize bad arguments by others,and to avoid producing bad arguments oneself. This is particularlytrue of the tricky cases, namely arguments that appear legitimate butare not, i.e., fallacies. Some well-know types of fallacies include (see entry on fallacies for a more extensive discussion): The fallacy of equivocation, which occurs when an arguer exploitsthe ambiguity of a term or phrase which has occurred at least twice inan argument to draw an unwarranted conclusion. The fallacy of begging the question, when one of the premises andthe conclusion of an argument are the same proposition, butdifferently formulated. The fallacy of appeal to authority, when a claim is supported byreference to an authority instead of offering reasons to supportit. The ad hominem fallacy, which involves bringing negative aspectsof an arguer, or their situation, to argue against the view they areadvancing. The fallacy of faulty analogy, when an analogy is used as anargument but there is not sufficient relevant similarity between thesource domain and the target domain (as discussed above).Beyond their (presumed?) usefulness in teaching argumentative skills,the literature on fallacies raises a number of important philosophicaldiscussions, such as: What determines when an argument is fallacious or rather alegitimate argument? (See section 4.3 below on Bayesian accounts of fallacies) What causes certain arguments to be fallacious? Is the focus on fallacies a useful approach to arguments at all?(Massey 1981) Despite the occasional criticism, the concept of fallacies remainscentral in the study of arguments and argumentation. 3. Types of Argumentation Just as there are different types of arguments, there are differenttypes of argumentative situations, depending on the communicativegoals of the persons involved and background conditions. Argumentationmay occur when people are trying to reach consensus in a situation ofdissent, but it may also occur when scientists discuss their findingswith each other (to name but two examples). Specific rules ofargumentative engagement may vary depending on these different typesof argumentation. A related point extensively discussed in the recent literaturepertains to the function(s) of argumentation.[3] Whats the point of arguing? While it is often recognized thatargumentation may have multiple functions, different authors tend toemphasize specific functions for argumentation at the expense ofothers. This section offers an overview of discussions on types ofargumentation and its functions, demonstrating that argumentation is amultifaceted phenomenon that has different applications in differentcircumstances. 3.1 Adversarial and cooperative argumentation A question that has received much attention in the literature of thepast decades pertains to whether the activity of argumentation isprimarily adversarial or primarily cooperative. This question in factcorresponds to two sub-questions: the descriptive question ofwhether instances of argumentation are on the whole primarilyadversarial or cooperative; and the normative question ofwhether argumentation should be (primarily) adversarial orcooperative. A number of authors have answered adversarial to thedescriptive question and cooperative to the normativequestion, thus identifying a discrepancy between practices andnormative ideals that must be remedied (or so they claim; Cohen 1995). A case in point: recently, a number of far-right Internet personalitieshave advocated the idea that argumentation can be used to overpowerones opponents, as described in the book The Art of theArgument: Western Civilizations Last Stand (2017) by thewhite supremacist S. Molyneux. Such aggressive practices reflect avision of argumentation as a kind of competition or battle, where thegoal is to score points and beat theopponent. Authors who have criticized (overly) adversarialpractices of argumentation include (Moulton 1983; Gilbert 1994; Rooney2012; Hundleby 2013; Bailin & Battersby 2016). Many (but not all)of these authors formulated their criticism specifically from afeminist perspective (see entry on feminist perspectives on argumentation). Feminist critiques of adversarial argumentation challenge ideals ofargumentation as a form of competition, where masculine-coded valuesof aggression and violence prevail (Kidd 2020). For these authors,such ideals encourage argumentative performances where excessive useof forcefulness is on display. Instances of aggressive argumentationin turn have a number of problematic consequences: epistemicconsequencesthe pursuit of truth is not best served byadversarial argumentationas well as moral/ethical/politicalconsequencesthese practices exclude a number of people fromparticipating in argumentative encounters, namely those for whomdisplays of aggression do not constitute socially acceptable behavior(women and other socially disadvantaged groups in particular). Theseauthors defend alternative conceptions of argumentation as acooperative, nurturing activity (Gilbert 1994; Bailin & Battersby2016), which are traditionally feminine-coded values. Crucially, theyview adversarial conceptions of argumentation as optional,maintaining that the alternatives are equally legitimate and thatcooperative conceptions should be adopted and cultivated. By contrast, others have argued that adversariality, when suitablyunderstood, can be seen as an integral and in fact desirable componentof argumentation (Govier 1999; Aikin 2011; Casey 2020; but notice thatthese authors each develop different accounts of adversariality inargumentation). Such authors answer adversarial both tothe descriptive and to the normative questions stated above. Oneoverall theme is the need to draw a distinction between (excessive)aggressiveness and adversariality as such. Govier, for example,distinguishes between ancillary (negative) adversariality and minimaladversariality (Govier 1999). The thought is that, while the feministcritique of excessive aggression in argumentation is well taken,adversariality conceived and practiced in different ways need not havethe detrimental consequences of more extreme versions of belligerentargumentation. Moreover, for these authors, adversariality inargumentation is simply not optional: it is an intrinsic feature ofargumentative practices, but these practices also require a backgroundof cooperation and agreement regarding, e.g., the accepted rules ofinference. But ultimately, the presumed opposition between adversarial andcooperative conceptions of argumentation may well be merely apparent.It may be argued for example that actual argumentative encountersought to be adversarial or cooperative to different degrees, asdifferent types of argumentation are required for different situations(Dutilh Novaes forthcoming). Indeed, perhaps we should not look for aone-fits-all model of how argumentation ought to be conducted acrossdifferent contexts and situation, given the diversity of uses ofargumentation. 3.2 Argumentation as an epistemic practice We speak of argumentation as an epistemic practice when we take itsprimary purpose to be that of improving our beliefs and increasingknowledge, or of fostering understanding. To engage in argumentationcan be a way to acquire more accurate beliefs: by examining criticallyreasons for and against a given position, we would be able to weed outweaker, poorly justified beliefs (likely to be false) and end up withstronger, suitably justified beliefs (likely to be true). From thisperspective, the goal of engaging in argumentation is tolearn, i.e., to improve ones epistemic position (asopposed to argumentation to win (Fisher & Keil2016)). Indeed, argumentation is often said to betruth-conducive (Betz 2013). The idea that argumentation can be an epistemically beneficial processis as old as philosophy itself. In every major historicalphilosophical tradition, argumentation is viewed as an essentialcomponent of philosophical reflection precisely because it may be usedto aim at the truth (indeed this is the core of Platos critiqueof the Sophists and their excessive focus on persuasion at the expenseof truth (Irani 2017; see Historical Supplement). Recent proponents of an epistemological approach to argumentationinclude (Goldman 2004; Lumer 2005; Biro & Siegel 2006). AlvinGoldman captures this general idea in the following terms: Norms of good argumentation are substantially dedicated to thepromotion of truthful speech and the exposure of falsehood, whetherintentional or unintentional. [] Norms of good argumentationare part of a practice to encourage the exchange of truths throughsincere, non-negligent, and mutually corrective speech. (Goldman 1994:30)Of course, it is at least in theory possible to engage inargumentation with oneself along these lines, solitarily weighing thepros and cons of a position. But a number of philosophers, mostnotably John Stuart Mill, maintain that interpersonalargumentative situations, involving people who truly disagree witheach other, work best to realize the epistemic potential ofargumentation to improve our beliefs (a point he developed in OnLiberty (1859; see entry on John Stuart Mill). When our ideas are challenged by engagement with those who disagreewith us, we are forced to consider our own beliefs more thoroughly andcritically. The result is that the remaining beliefs, those that havesurvived critical challenge, will be better grounded than those weheld before such encounters. Dissenters thus force us to stayepistemically alert instead of becoming too comfortable with existing,entrenched beliefs. On this conception, arguers cooperate with eachother precisely by being adversarial, i.e., by adopting a criticalstance towards the positions one disagrees with. The view that argumentation aims at epistemic improvement is in manysenses appealing, but it is doubtful that it reflects the actualoutcomes of argumentation in many real-life situations. Indeed, itseems that, more often than not, we are not Millians when arguing: wedo not tend to engage with dissenting opinions with an open mind.Indeed, there is quite some evidence suggesting that arguments are infact not a very efficient means to change minds in most real-lifesituations (Gordon-Smith 2019). People typically do not like to changetheir minds about firmly entrenched beliefs, and so when confrontedwith arguments or evidence that contradict these beliefs, they tend toeither look away or to discredit the source of the argument asunreliable (Dutilh Novaes 2020c)a phenomenon also known asconfirmation bias (Nickerson 1998). In particular, arguments that threaten our core beliefs and our senseof belonging to a group (e.g., political beliefs) typically triggerall kinds of motivated reasoning (Taber & Lodge 2006; Kahan 2017)whereby one outright rejects those arguments without properly engagingwith their content. Relatedly, when choosing among a vast supply ofoptions, people tend to gravitate towards content and sources thatconfirm their existing opinions, thus giving rise to so-calledecho chambers and epistemic bubbles(Nguyen 2020). Furthermore, some arguments can be deceptivelyconvincing in that they look valid but are not (Tindale 2007; seeentry on fallacies). Because most of us are arguably not very good at spotting fallaciousarguments, especially if they are arguments that lend support to thebeliefs we already hold, engaging in argumentation may in factdecrease the accuracy of our beliefs by persuading us offalse conclusions with incorrect arguments (Fantl 2018). In sum, despite the optimism of Mill and many others, it seems thatengaging in argumentation will not automatically improve our beliefs(even if this may occur in some circumstances).[4] However, it may still be argued that an epistemological approach toargumentation can serve the purpose of providing a normativeideal for argumentative practices, even if it is not always adescriptively accurate account of these practices in the messy realworld. Moreover, at least some concrete instances ofargumentation, in particular argumentation in science (see section 4.5 below) seem to offer successful examples of epistemic-orientedargumentative practices. 3.3 Consensus-oriented argumentation Another important strand in the literature on argumentation aretheories that view consensus as the primary goal ofargumentative processes: to eliminate or resolve a difference of(expressed) opinion. The tradition of pragma-dialectics is a prominentrecent exponent of this strand (Eemeren & Grootendorst 2004).These consensus-oriented approaches are motivated by the socialcomplexity of human life, and the attribution of a role of socialcoordination to argumentation. Because humans are social animals whomust often cooperate with other humans to successfully accomplishcertain tasks, they must have mechanisms to align their beliefs andintentions, and subsequently their actions (Tomasello 2014). Thethought is that argumentation would be a particularly suitablemechanism for such alignment, as an exchange of reasons would make itmore likely that differences of opinion would decrease (Norman 2016).This may happen precisely because argumentation would be a good way totrack truths and avoid falsehoods, as discussed in the previoussection; by being involved in the same epistemic process of exchangingreasons, the participants in an argumentative situation would all cometo converge towards the truth, and thus the upshot would be that theyalso come to agree with each other. However, consensus-oriented viewsneed not presuppose that argumentation is truth-conducive: theultimate goal of such instances of argumentation is that of socialcoordination, and for this tracking truth is not a requirement(Patterson 2011). In particular, the very notion of deliberative democracy isviewed as resting crucially on argumentative practices that aim forconsensus (Fishkin 2016; see entry on democracy). (For present purposes, deliberation andargumentation can be treated as roughly synonymous). Ina deliberative democracy, for a decision to be legitimate, it must bepreceded by authentic public deliberationa discussion of thepros and cons of the different optionsnot merely theaggregation of preferences that occurs in voting. Moreover, indemocratic deliberation, when full consensus does not emerge, theparties involved may opt for a compromise solution, e.g., acoalition-based political system. A prominent theorist of deliberative democracy thus understood isJrgen Habermas, whose discourse theory of law anddemocracy relies heavily on practices of politicaljustification and argumentation taking place in what he callsthe public sphere (Habermas 1992 [1996]; 1981 [1984];see entry on Habermas). He starts from the idea that politics allows for the collectiveorganization of peoples lives, including the common rules theywill live by. Political argumentation is a form of communicativepractice, so general assumptions for communicative practices ingeneral apply. However, additional assumptions apply as well (Olson2011 [2014]). In particular, deliberating participants must acceptthat anyone can participate in these discursive practices (democraticdeliberation should be inclusive), and that anyone can introduce andchallenge claims that are made in the public sphere (democraticdeliberation should be free). They must also see one another as havingequal status, at least for the purposes of deliberation (democraticdeliberation should be equal). In turn, critics of Habermassaccount view it as unrealistic, as it presupposes an ideal situationwhere all citizens are treated equally and engage in public debates ingood faith (Mouffe 1999; Geuss 2019). More generally, it seems that it is only under quite specificconditions that argumentation reliably leads to consensus (as alsosuggested by formal modeling of argumentative situations (Betz 2013;Olsson 2013; Ms & Flache 2013)). Consensus-orientedargumentation seems to work well in cooperative contexts, but not so much in situations of conflict (Dutilh Novaes forthcoming). Inparticular, the discussing parties must already have a significantamount of background agreementespecially agreement on whatcounts as a legitimate argument or compelling evidenceforargumentation and deliberation to lead to consensus. Especially insituations of deep disagreement (Fogelin 1985), it seems that thepotential of argumentation to lead to consensus is quite limited.Instead, in many real-life situations, argumentation often leads tothe opposite result; people disagree with each other even more afterengaging in argumentation (Sunstein 2002). This is the well-documentedphenomenon of group polarization, which occurs when aninitial position or tendency of individual members of a group becomesmore extreme after group discussion (Isenberg 1986). In fact, it may be argued that argumentation will often create orexacerbate conflict and adversariality, rather than leading to theresolution of differences of opinions. Furthermore, a focus onconsensus may end up reinforcing and perpetuating existing unequalpower relations in a society. In an unjust society, what purports to be a cooperative exchange ofreasons really perpetuates patterns of oppression. (Goodwin 2007: 77)This general point has been made by a number of political thinkers(e.g., Young 2000), who have highlighted the exclusionary implicationsof consensus-oriented political deliberation. The upshot is thatconsensus may not only be an unrealistic goal for argumentation; itmay not even be a desirable goal for argumentation in anumber of situations (e.g., when there is great power imbalance).Despite these concerns, the view that the primary goal ofargumentation is to aim for consensus remains influential in theliterature. 3.4 Argumentation and conflict management Finally, a number of authors have attributed to argumentation thepotential to manage (pre-existing) conflict. In a sense, theconsensus-oriented view of argumentation just discussed is a specialcase of conflict management argumentation, based on the assumptionthat the best way to manage conflict and disagreement is to aim forconsensus and thus eliminate conflict. But conflict can bemanaged in different ways, not all of them leading to consensus;indeed, some authors maintain that argumentation may help mitigateconflict even when the explicit aim is not that of reaching consensus.Importantly, authors who identify conflict management (or variationsthereof) as a function for argumentation differ in their overallappreciation of the value of argumentation: some take it to be at bestfutile and at worst destructive,[5] while others attribute a more positive role to argumentation inconflict management. To this category also belong the conceptualizations ofargumentation-as-war discussed (and criticized) by a number of authors(Cohen 1995; Bailin & Battersby 2016); in such cases, conflict isnot so much managed but rather enacted (and possiblyexacerbated) by means of argumentation. Thus seen, the function ofargumentation would not be fundamentally different from the functionof organized competitive activities such as sports or even war (withsuitable rules of engagement; Aikin 2011). When conflict emerges, people have various options: they may choosenot to engage and instead prefer to flee; they may go into full-blownfighting mode, which may include physical aggression; or they may optfor approaches somewhere in between the fight-or-flee extremes of thespectrum. Argumentation can be plausibly classified as an intermediaryresponse: [A]rgument literally is a form of pacifismwe are using wordsinstead of swords to settle our disputes. With argument, we settle ourdisputes in ways that are most respectful of those whodisagreewe do not buy them off, we do not threaten them, and wedo not beat them into submission. Instead, we give them reasons thatbear on the truth or falsity of their beliefs. However adversarialargument may be, it isnt bombing. [] argument is apacifistic replacement for truly violent solutions todisagreements. (Aikin 2011: 256)This is not to say that argumentation will always or even typically bethe best approach to handle conflict and disagreement; the point israther that argumentation at least has the potential to do so,provided that the background conditions are suitable and thatprovisions to mitigate escalation are in place (Aikin 2011). Versionsof this view can be found in the work of proponents of agonisticconceptions of democracy and political deliberation (Wenman 2013; seeentry on feminist political philosophy). For agonist thinkers, conflict and strife are inevitable features ofhuman lives, and so cannot be eliminated; but they can be managed. Oneof them is Chantal Mouffe (Mouffe 2000), for whom democraticpractices, including argumentation/deliberation, can serve to containhostility and transform it into more constructive forms of contest.However, it is far from obvious that argumentation by itself willsuffice to manage conflict; typically, other kinds of interventionmust be involved (Young 2000), as the risk of argumentation being usedto exercise power rather than as a tool to manage conflict alwayslooms large (van Laar & Krabbe 2019). 3.5 Conclusion From these observations on different types of argumentation, apluralistic picture emerges: argumentation, understood as the exchangeof reasons to justify claims, seems to have different applications indifferent situations. However, it is not clear that some of the goalsoften attributed to argumentation such as epistemic improvement andreaching consensus can in fact be reliably achieved in many real lifesituations. Does this mean that argumentation is useless and futile?Not necessarily, but it may mean that engaging in argumentation willnot always be the optimal response in a number of contexts. 4. Argumentation Across Fields of Inquiry and Social Practices Argumentation is practiced and studied in many fields of inquiry;philosophers interested in argumentation have much to benefit fromengaging with these bodies of research as well. 4.1 Argumentation theory To understand the emergence of argumentation theory as a specificfield of research in the twentieth century, a brief discussion ofpreceding events is necessary. In the nineteenth century, a number oftextbooks aiming to improve everyday reasoning via public educationemphasized logical and rhetorical concerns, such as those by RichardWhately (see entry on fallacies). As noted in section 3.2, John Stuart Mill also had a keen interest in argumentation and itsrole in public discourse (Mill 1859), as well as an interest in logicand reasoning (see entries on Mill and on fallacies). But with the advent of mathematical logic in the final decades of the nineteenth century,logic and the study of ordinary, everyday argumentation came apart, aslogicians such as Frege, Hilbert, Russell etc. were primarilyinterested in mathematical reasoning and argumentation. As aresult, their logical systems are not particularly suitable to studyeveryday argumentation, as this is simply not what they were designedto do.[6] Nevertheless, in the twentieth century a number of authors tookinspiration from developments in formal logic and expanded the use oflogical tools to the analysis of ordinary argumentation. A pioneer inthis tradition is Susan Stebbing, who wrote what can be seen as thefirst textbook in analytic philosophy, and then went on to write anumber of books aimed at a general audience addressing everyday andpublic discourse from a philosophical/logical perspective (see entryon Susan Stebbing). Her 1939 book Thinking to Some Purpose, which can beconsidered as one of the first textbooks in critical thinking, waswidely read at the time, but did not become particularly influentialfor the development of argumentation theory in the decades tofollow. By contrast, Stephen Toulmins 1958 book The Uses ofArgument has been tremendously influential in a wide range offields, including critical thinking education, rhetoric, speechcommunication, and computer science (perhaps even more so than inToulmins own original field, philosophy). Toulmins aimwas to criticize the assumption (widely held by Anglo-Americanphilosophers at the time) that any significant argument can beformulated in purely formal, deductive terms, using the formal logicalsystems that had emerged in the preceding decades (see (Eemeren,Garssen, et al. 2014: ch. 4). While this critique was met with muchhostility among fellow philosophers, it eventually gave rise to analternative way of approaching argumentation, which is often describedas informal logic (see entry on informal logic). This approach seeks to engage and analyze instances of argumentationin everyday life; it recognizes that, while useful, the tools ofdeductive logic alone do not suffice to investigate argumentation inall its complexity and pragmatic import. In a similar vein, CharlesHamblins 1970 book Fallacies reinvigorated the studyof fallacies in the context of argumentation by re-emphasizing(following Aristotle) the importance of a dialectical-dialogicalbackground when reflecting on fallacies in argumentation (see entry on fallacies). Around the same time as Toulmin, Cham Perelman and LucieOlbrechts-Tyteca were developing an approach to argumentation thatemphasized its persuasive component. To this end, they turned toclassical theories of rhetoric, and adapted them to give rise to whatthey described as the New Rhetoric. Their bookTrait de largumentation: La nouvellerhtorique was published in 1958 in French, and translatedinto English in 1969. Its key idea: since argumentation aims at securing the adherence of those to whom itis addressed, it is, in its entirety, relative to the audience to beinfluenced. (Perelman & Olbrechts-Tyteca 1958 [1969: 19]) They introduced the influential distinction between universaland particular audiences: while every argument is directed ata specific individual or group, the concept of a universal audienceserves as a normative ideal encapsulating shared standards ofagreement on what counts as legitimate argumentation (see Eemeren,Garssen, et al. 2014: ch. 5). The work of these pioneers provided the foundations for subsequentresearch in argumentation theory. One approach that became influentialin the following decades is the pragma-dialectics tradition developedby Frans van Eemeren and Rob Grootendorst (Eemeren & Grootendorst1984, 2004). They also founded the journal Argumentation, oneof the flagship journals in argumentation theory. Pragma-dialecticswas developed to study argumentation as a discourse activity, acomplex speech act that occurs as part of interactional linguisticactivities with specific communicative goals (pragmarefers to the functional perspective of goals, anddialectic to the interactive component). For theseauthors, argumentative discourse is primarily directed at thereasonable resolution of a difference of opinion. Pragma-dialecticshas a descriptive as well as a normative component, thus offeringtools both for the analysis of concrete instances of argumentation andfor the evaluation of argumentation correctness and success (seeEemeren, Garssen, et al. 2014: ch. 10). Another leading author in argumentation theory is Douglas Walton, whopioneered the argument schemes approach to argumentation that borrowstools from formal logic but expands them so as to treat a wider rangeof arguments than those covered by traditional logical systems(Walton, Reed, & Macagno 2008). Walton also formulated aninfluential account of argumentation in dialogue in collaboration withErik Krabbe (Walton & Krabbe 1995). Ralph Johnson and AnthonyBlair further helped to consolidate the field of argumentation theoryand informal logic by founding the Centre for Research in Reasoning,Argumentation, and Rhetoric in Windsor (Ontario, Canada), and byinitiating the journal Informal Logic. Their textbookLogical Self-Defense (Johnson & Blair 1977) has also beenparticularly influential. 4.2 Artificial intelligence and computer science The study of argumentation within computer science and artificialintelligence is a thriving field of research, with dedicated journalssuch as Argument and Computation and regular conferenceseries such as COMMA (International Conference on Computational Modelsof Argument; see Rahwan & Simari 2009 and Eemeren, Garssen, et al.2014: ch. 11 for overviews). The historical roots of argumentation research in artificialintelligence can be traced back to work on non-monotonic logics (seeentry on non-monotonic logics) and defeasible reasoning (see entry on defeasible reasoning). Since then, three main different perspectives have emerged (Eemeren,Garssen, et al. 2014: ch. 11): the theoretical systems perspective,where the focus is on theoretical and formal models of argumentation(following the tradition of philosophical and formal logic); theartificial systems perspective, where the aim is to build computerprograms that model or support argumentative tasks, for instance, inonline dialogue games or in expert systems; the natural systemsperspective, which investigates argumentation in its natural form withthe help of computational tools (e.g., argumentation mining [Peldszus& Stede 2013; Habernal & Gurevych 2017], where computationalmethods are used to identify argumentative structures in large corporaof texts). An influential approach in this research tradition is that ofabstract argumentation frameworks, initiated by thepioneering work of Dung (1995). Before that, argumentation in AI wasstudied mostly under the inspiration of concepts coming from informallogic such as argumentation schemes, context, stages of dialogues andargument moves. By contrast, the key notion in the framework proposedby Dung is that of argument attack, understood as an abstractformal relation roughly intended to capture the idea that it ispossible to challenge an argument by means of another argument(assertions are understood as a special case of arguments with zeropremises). Arguments can then be represented in networks of attacksand defenses: an argument A can attack an argument B,and B in turn may attack further arguments C andD (the connection with the notion of defeaters is anatural one, which Dung also addresses). Besides abstract argumentation, three other important lines ofresearch in AI are: the (internal) structure of arguments;argumentation in multi-agent systems; applications to specific tasksand domains (Rahwan & Siwari 2009). The structural approachinvestigates formally features such as argument strength/force (e.g.,a conclusive argument is stronger than a defeasible argument),argument schemes (Bex, Prakken, Reed, & Walton 2003) etc.Argumentation in multi-agent systems is a thriving subfield with itsown dedicated conference series (ArgMAS), based on the recognitionthat argumentation is a particularly suitable vehicle to facilitateinteraction in the artificial environments studied by AI researchersworking on multi-agent systems (see a special issue of the journalArgument & Computation [Atkinson, Cerutti, et al. 2016]).Finally, computational approaches in

argumentation have also thrivedwith respect to specific domains and applications, such as legalargumentation (Prakken & Sartor 2015). Recently, as a reaction tothe machine-learning paradigm, the idea of explainable AI has gottentraction, and the concept of argumentation is thought to play afundamental role for explainable AI (Sklar & Azhar 2018). 4.3 Cognitive science and psychology Argumentation is also an important topic of investigation withincognitive science and psychology. Researchers in these fields arepredominantly interested in the descriptive question of how people infact engage in argumentation, rather than in the normative question ofhow they ought to do it (although some of them have also drawnnormative conclusions, e.g., Hahn & Oaksford 2006; Hahn &Hornikx, 2016). Controlled experiments are one of the ways in which the descriptive question can be investigated. Systematic research specifically on argumentation withincognitive science and psychology has significantly increased over thelast 10 years. Before that, there had been extensive research onreasoning conceived as an individual, internal process, much of whichhad been conducted using task materials such as syllogistic arguments(Dutilh Novaes 2020b). But due to what may be described as anindividualist bias in cognitive science and psychology (Mercier 2018),these researchers did not draw explicit connections between theirfindings and the public acts of giving and asking forreasons. It is only somewhat recently that argumentation beganto receive sustained attention from these researchers. Theinvestigations of Hugo Mercier and colleagues (Mercier & Sperber2017; Mercier 2018) and of Ulrike Hahn and colleagues (Hahn &Oaksford 2007; Hornikx & Hahn 2012; Collins & Hahn 2018) havebeen particularly influential. (See also Paglieri, Bonelli, &Felletti 2016, an edited volume containing a representative overviewof research on the psychology of argumentation.) Another interestingline of research has been the study of the development of reasoningand argumentative skills in young children (Kymen, Mammen, &Tomasello 2016; Kymen & Tomasello 2020). Mercier and Sperber defend an interactionist account of reasoning,according to which the primary function of reasoning is for socialinteractions, where reasons are exchanged and receivers of reasonsdecide whether they find them convincingin other words, forargumentation (Mercier & Sperber 2017). They review a wealth ofevidence suggesting that reasoning is rather flawed when it comes todrawing conclusions from premises in order to expand onesknowledge. From this they conclude, on the basis of evolutionaryarguments, that the function of reasoning must be a different one,indeed one that responds to features of human sociality and the needto exercise epistemic vigilance when receiving information fromothers. This account has inaugurated a rich research program which they have been pursuing with colleagues for overa decade now, and which has delivered some interesting resultsforexample, that we seem to be better at evaluating the quality ofarguments proposed by others than at formulating high-quality argumentsourselves (Mercier 2018). In the context of the Bayesian (see entry on Bayes theorem) approach to reasoning that was first developed by Mike Oaksford andNick Chater in the 1980s (Oaksford & Chater 2018), Hahn andcolleagues have extended the Bayesian framework to the investigationof argumentation. They claim that Bayesian probabilities offer anaccurate descriptive model of how people evaluate the strength ofarguments (Hahn & Oaksford 2007) as well as a solid perspective toaddress normative questions pertaining to argument strength (Hahn& Oaksford 2006; Hahn & Hornikx 2016). The Bayesian approachallows for the formulation of probabilistic measures of argumentstrength, showing that many so-called fallacies maynevertheless be good arguments in the sense that they considerablyraise the probability of the conclusion. For example, deductivelyinvalid argument schemes (such as affirming the consequent (AC) anddenying the antecedent (DA)) can also provide considerable support fora conclusion, depending on the contents in question. The extent towhich this is the case depends primarily on the specific informationalcontext, captured by the prior probability distribution, not on thestructure of the argument. This means that some instances of, say, AC,may offer support to a conclusion while others may fail to do so (Eva& Hartmann 2018). Thus seen, Bayesian argumentation represents asignificantly different approach to argumentation from those inspiredby logic (e.g., argument schemes), but they are not necessarily incompatible;they may well be complementary perspectives (see also [Zenker2013]). 4.4 Language and communication Argumentation is primarily (though not exclusively) a linguisticphenomenon. Accordingly, argumentation is extensively studied infields dedicated to the study of language, such as rhetoric,linguistics, discourse analysis, communication, and pragmatics, amongothers (see Eemeren, Garssen, et al. 2014: chs 8 and 9). Researchersin these areas develop general theoretical models of argumentation andinvestigate concrete instances of argumentation in specific domains onthe basis of linguistic corpora, discourse analysis, and other methodsused in the language sciences (see the edited volume Oswald, Herman,& Jacquin [2018] for a sample of the different lines of research).Overall, research on argumentation within the language sciences tendsto focus primarily on concrete occurrences of arguments in a varietyof domains, adopting a largely descriptive rather than normativeperspective (though some of these researchers also tackle normativeconsiderations). Some of these analyses approach arguments and argumentation primarilyas text or self-contained speeches, while others emphasize theinterpersonal, communicative nature of face-to-faceargumentation (see Eemeren, Garssen, et al. 2014: section 8.9). Oneprominent approach in this tradition is due to communication scholarsSally Jackson and Scott Jacobs. They have drawn on speech act theoryand conversation analysis to investigate argumentation as adisagreement-relevant expansion of speech acts that, through mutuallyrecognized reasons, allows us to manage disagreements despite thechallenges they pose for communication and coordination of activities(Jackson & Jacobs 1980; Jackson 2019). Moreover, they perceiveinstitutionalized practices of argumentation and concreteargumentation designssuch as for examplerandomized controlled trials in medicineas interventions aimedat improving methods of disagreement management throughargumentation. Another communication scholar, Dale Hample, has further argued for theimportance of approaching argumentation as an essentiallyinterpersonal communicative activity (Hample 2006, 2018). Thisperspective allows for the consideration of a broader range offactors, not only the arguments themselves but also (and primarily)the people involved in those processes: their motivations,psychological processes, and emotions. It also allows for theformulation of questions pertaining to individual as well as culturaldifferences in argumentative styles (see section 5.3 below). Another illuminating perspective views argumentative practices asinherently tied to broader socio-cultural contexts (Amossy 2009). TheJournal of Argumentation in Context was founded in 2012precisely to promote a contextual approach to argumentation. Onceargumentation is no longer only considered in abstraction fromconcrete instances taking place in real-life situations, it becomesimperative to recognize that argumentation does not take place in avacuum; typically, argumentative practices are embedded in other kindsof practices and institutions, against the background of specificsocio-cultural, political structures. The method of discourse analysisis particularly suitable for a broader perspective on argumentation,as shown by the work of Ruth Amossy (2002) and Marianne Doury (2009),among others. 4.5 Argumentation in specific social practices Argumentation is crucial in a number of specific organized socialpractices, in particular in politics, science, law, and education. Therelevant argumentative practices are studied in each of thecorresponding knowledge domains; indeed, while some general principlesmay govern argumentative practices across the board, some may bespecific to particular applications and domains. As already mentioned, argumentation is typically viewed as anessential component of political democratic practices, and as such itis of great interest to political scientists and political theorists(Habermas 1992 [1996]; Young 2000; Landemore 2013; Fishkin 2016; seeentry on democracy). (The term typically used in this context isdeliberation instead of argumentation, butthese can be viewed as roughly synonymous for our purposes.) Generaltheories of argumentation such as pragma-dialectic and the Toulminmodel can be applied to political argumentation with illuminatingresults (Wodak 2016; Mohammed 2016). More generally, politicaldiscourse seems to have a strong argumentative component, inparticular if argumentation is understood more broadly as not onlypertaining to rational discourse (logos) but as alsoincluding what rhetoricians refer to as pathos andethos (Zarefsky 2014; Amossy 2018). But critics ofargumentation and deliberation in political contexts also point outthe limitations of the classical deliberative model (Sanders 1997;Talisse 2019). Moreover, scientific communities seem to offer good examples of(largely) well-functioning argumentative practices. These arediscipline d systems of collective epistemic activity, with tacit butwidely endorsed norms for argumentative engagement for each domain(which does not mean that there are not disagreements on these verynorms). The case of mathematics has already been mentioned above:practices of mathematical proof are quite naturally understood asargumentative practices (Dutilh Novaes 2020a). Furthermore, when ascientist presents a new scientific claim, it must be backed byarguments and evidence that her peers are likely to find convincing,as they follow from the application of widely agreed-upon scientificmethods (Longino 1990; Weinstein 1990; Rehg 2008; see entry on the social dimensions of scientific knowledge). Other scientists will in turn critically examine the evidence andarguments provided, and will voice objections or concerns if they findaspects of the theory to be insufficiently convincing. Thus seen,science may be viewed as a game of giving and asking forreasons (Zamora Bonilla 2006). Certain features of scientificargumentation seem to ensure its success: scientists see otherscientists as prima facie peers, and so (typically at least) place afair amount of trust in other scientists by default; science is basedon the principle of organized skepticism (a termintroduced by the pioneer sociologist of science Robert Merton [Merton, 1942]), whichmeans that asking for further reasons should not be perceived as apersonal attack. These are arguably aspects that distinguishargumentation in science from argumentation in other domains in virtueof these institutional factors (Mercier & Heintz 2014). Butultimately, scientists are part of society as a whole, and thus thequestion of how scientific and political argumentation intersectbecomes particularly relevant (Kitcher 2001). Another area where argumentation is essential is the law, which alsocorresponds to disciplined systems of collective activity with rulesand principles for what counts as acceptable arguments and evidence. In litigation (in particular in adversarial justice systems), thereare typically two sides disagreeing on what is lawful or just, and thebasic idea is that each side will present its strongest arguments; itis the comparison between the two sets of arguments that should leadto the best judgment (Walton 2002). Legal reasoning and argumentationhave been extensively studied within jurisprudence for decades, inparticular since Ronald Dworkins (1977) and NeilMacCormicks (1978) responses to HLA Harts highlyinfluential The Concept of Law (1961). A number of otherviews and approaches have been developed, in particular from theperspectives of natural law theory, legal positivism, common law, andrhetoric (see Feteris 2017 for an overview). Overall, legalargumentation is characterized by extensive uses of analogies (Lamond2014), abduction (Askeland 2020), and defeasible/non-monotonicreasoning (Bex & Verheij 2013). An interesting question is whetherargumentation in law is fundamentally different from argumentation inother domains, or whether it follows the same overall canons and normsbut applied to legal topics (Raz 2001). Finally, the development of argumentative skills is arguably afundamental aspect of (formal) education (Muller Mirza &Perret-Clermont 2009). Ideally, when presented with arguments, alearner should not simply accept what is being said at face value, butshould instead reflect on the reasons offered and come to her ownconclusions. Argumentation thus fosters independent, criticalthinking, which is viewed as an important goal for education (Siegel1995; see entry on critical thinking). A number of education theorists and developmental psychologists haveempirically investigated the effects of emphasizing argumentativeskills in educational settings, with encouraging results (Kuhn &Crowell 2011). There has been in particular much emphasis onargumentation specifically in science education, based on theassumption that argumentation is a key component of scientificpractice (as noted above); the thought is that this feature ofscientific practice should be reflected in science education (Driver,Newton, & Osborne 2000; Erduran & Jimnez-Aleixandre2007). 5. Further Topics Argumentation is a multi-faceted phenomenon, and the literature onarguments and argumentation is massive and varied. This entry can onlyscratch the surface of the richness of this material, and manyinteresting, relevant topics must be left out for reasons of space. Inthis final section, a selection of topics that are likely to attractconsiderable interest in future research are discussed. 5.1 Argumentative injustice and virtuous argumentation In recent years, the concept of epistemic injustice has received muchattention among philosophers (Fricker 2007; McKinnon 2016). Epistemicinjustice occurs when a person is unfairly treated qua knower on thebasis of prejudices pertaining to social categories such as gender,race, class, ability etc. (see entry on feminist epistemology and philosophy of science). One of the main categories of epistemic injustice discussedin the literature pertains to testimony and is known as testimonialinjustice: this occurs when a testifier is not given a degree ofcredibility commensurate to their actual expertise on the relevanttopic, as a result of prejudice. (Whether credibility excess is also aform of testimonial injustice is a moot point in the literature[Medina 2011].) Since argumentation can be viewed as an important mechanism forsharing knowledge and information, i.e., as having significantepistemic import (Goldman 2004), the question arises whether theremight be instances of epistemic injustice pertaining specifically toargumentation, which may be described as argumentativeinjustice, and which would be notably different from otherrecognized forms of epistemic injustice such as testimonial injustice.Bondy (Bondy 2010) presented a first articulation of the notion ofargumentative injustice, modeled after Frickers notion ofepistemic injustice and relying on a broadly epistemologicalconception of argumentation. However, Bondys analysis does nottake into account some of the structural elements that have becomecentral to the analysis of epistemic injustice since Frickersinfluential work, so it seems further discussion of epistemicinjustice in argumentation is still needed. For example, in situationsof disagreement, epistemic injustice can give rise to furtherobstacles to rational argumentation, leading to deep disagreement(Lagewaard 2021). Moreover, as often noted by critics of adversarial approaches,argumentation can also be used as an instrument of domination andoppression used to overpower and denigrate an interlocutor (Nozick1981), especially an interlocutor of lower status in thecontext in question (Moulton 1983; see entry on feminist approaches to argumentation). From this perspective, it is clear that argumentation may also beused to reinforce and exacerbate injustice, inequalities and powerdifferentials (Goodwin 2007). Given this possibility, and in responseto the perennial risk of excessive aggressiveness in argumentativesituations, a normative account of how argumentation ought tobe conducted so as to avoid these problematic outcomes seem to berequired. One such approach is virtue argumentation theory. Drawing onvirtue ethics and virtue epistemology (see entries on virtue ethics and virtue epistemology), virtue argumentation theory seeks to theorize how to argue well interms of the dispositions and character of arguers rather than, forexample, in terms of properties of arguments considered in abstractionfrom arguers (Aberdein & Cohen 2016). Some of the argumentativevirtues identified in the literature are: willingness to listen toothers (Cohen 2019), willingness to take a novel viewpoint seriously(Kwong 2016), humility (Kidd 2016), and open-mindedness (Tanesini2020). By the same token, defective argumentation is conceptualized not(only) in terms of structural properties of arguments (e.g.,fallacious argument patterns), but in terms of the vices displayed byarguers such as arrogance and narrow-mindedness, among others(Aberdein 2016). Virtue argumentation theory now constitutes a vibrantresearch program, as attested by a special issue of Topoidedicated to the topic (see [Aberdein & Cohen 2016] for its Introduction). It allows fora reconceptualization of classical themes within argumentation theorywhile also promising to provide concrete recommendations on how toargue better. Whether it can fully counter the risk of epistemicinjustice and oppressive uses of argumentation is however debatable,at least as long as broader structural factors related to powerdynamics are not sufficiently taken into account (Kukla 2014). 5.2 Emotions and argumentation On some idealized construals, argumentation is conceived as a purelyrational, emotionless endeavor. But the strong connection betweenargumentative activities and emotional responses has also long beenrecognized (in particular in rhetorical analyses of argumentation),and more recently has become the object of extensive research (Walton1992; Gilbert 2004; Hample 2006: ch. 5). Importantly, the recognitionof a role for emotions in argumentation does not entail a completerejection of the rationality of argumentation; rather,it is based on the rejection of a strict dichotomy between reason andemotion (see entry on emotion), and on a more encompassing conception of argumentation as amulti-layered human activity. Rather than dispassionate exchanges of reasons, instances ofargumentation typically start against the background of existingemotional relations, and give rise to further affectiveresponsesoften, though not necessarily, negative responses ofaggression and hostility. Indeed, it has been noted that, by itself,argumentation can give rise to conflict and friction where there wasnone to be found prior to the argumentative engagement (Aikin 2011).This occurs in particular because critical engagement and requests forreasons are at odds with default norms of credulity in most mundanedialogical interactions, thus creating a perception of antagonism. Butargumentation may also give rise to positive affective responses ifthe focus is on coalescence and cooperation rather than on hostility(Gilbert 1997). The descriptive claim that instances of argumentation are typicallyemotionally charged is not particularly controversial, though itdeserves to be further investigated; the details of affectiveresponses during instances of argumentation and how to deal with themare non-trivial (Krabbe & van Laar 2015). What is potentially morecontroversial is the normative claim that instances ofargumentation may or should be emotionally charged,i.e., that emotions may or ought to be involved in argumentativeprocesses, even if it may be necessary to regulate them in suchsituations rather than giving them free rein (Gonzlez,Gmez, & Lemos 2019). The significance of emotions forpersuasion has been recognized for millennia (see entry on Aristotles rhetoric), but more recently it has become clear that emotions also have afundamental role to play for choices of what to focus on and what tocare about (Sinhababu 2017). This general point seems to apply toinstances of argumentation as well. For example, Howes and Hundleby(Howes & Hundleby 2018) argue that, contrary to what is oftenthought, anger can in fact make a positive contribution toargumentative encounters. Indeed, anger may have an importantepistemological role in such encounters by drawing attention torelevant premises and information that may otherwise go unnoticed.(They recognize that anger may also derail argumentation when theencounter becomes a full-on confrontation.) In sum, the study of the role of emotions for argumentation, bothdescriptively and normatively speaking, has attracted the interest ofa number of scholars, traditionally in connection with rhetoric andmore recently also from the perspective of argumentation asinterpersonal communication (Hample 2006). And yet, much work remainsto be done on the significance of emotions for argumentation, inparticular given that the view that argumentation should be a purelyrational, dispassionate endeavor remains widely (even if tacitly)endorsed. 5.3 Cross-cultural perspectives on argumentation Once we adopt the perspective of argumentation as a communicativepractice, the question of the influence of cultural factors onargumentative practices naturally arises. Is there significantvariability in how people engage in argumentation depending on theirsociocultural backgrounds? Or is argumentation largely the samephenomenon across different cultures? Actually, we may even askourselves whether argumentation in fact occurs in all human cultures,or whether it is the product of specific, contingent backgroundconditions, thus not being a human universal. For comparison: it hadlong been assumed that practices of counting were present in all humancultures, even if with different degrees of complexity. But in recentdecades it has been shown that some cultures do not engagesystematically in practices of counting and basic arithmetic at all,such as the Pirah in the Amazon (Gordon 2004; see entry on culture and cognitive science). By analogy, it seems that the purported universality of argumentativepractices should not be taken for granted, but rather be treated as alegitimate empirical question. (Incidentally, there is some anecdotalevidence that the Pirah themselves engage in argumentativeexchanges [Everett 2008], but to date their argumentative skills havenot been investigated systematically, as is the case with theirnumerical skills.) Of course, how widespread argumentative practices will be also dependson how the concept of argumentative practices is definedand operationalized in the first place. If it is narrowly defined ascorresponding to regimented practices of reason-giving requiring clearmarkers and explicit criteria for what counts as premises, conclusionsand relations of support between them, then argumentation may well berestricted to cultures and subcultures where such practices have beenexplicitly codified. By contrast, if argumentation is defined moreloosely, then a wider range of communicative practices will beconsidered as instances of argumentation, and thus presumably morecultures will be found to engage in (what is thus viewed as)argumentation. This means that the spread of argumentative practicesacross cultures is not only an empirical question; it also requiressignificant conceptual input to be addressed. But if (as appears to be the case) argumentation is not a strictlyWEIRD phenomenon, restricted to Western, Educated, Industrialized,Rich, and Democratic societies (Henrich, Heine, & Norenzayan2010), then the issue of cross-cultural variability in argumentativepractices gives rise to a host of research questions, again both atthe descriptive and at the normative level. Indeed, even if at thedescriptive level considerable variability in argumentative practicesis identified, the normative question of whether there should beuniversally valid canons for argumentation, or instead specific normsfor specific contexts, remains pressing. At the descriptive level, anumber of researchers have investigated argumentative practices indifferent WEIRD as well as non-WEIRD cultures, also addressingquestions of cultural variability (Hornikx & Hoeken 2007; Hornikx& de Best 2011). A foundational work in this context is Edwin Hutchins 1980 bookCulture and Inference, a study of the TrobriandIslanders system of land tenure in Papua New Guinea (Hutchins1980). While presented as a study of inference and reasoning among theTrobriand Islanders, what Hutchins in fact investigated were instancesof legal argumentation in land courts by means of ethnographicobservation and interviews with litigants. This led to the formulationof a set of twelve basic propositions codifying knowledge about landtenure, as well as transfer formulas governing how this knowledge canbe applied to new disputes. Hutchins analysis showed that theTrobriand Islanders had a sophisticated argumentation system toresolve issues pertaining to land tenure, in many senses resemblingargumentation and reasoning in so-called WEIRD societies in that itseemed to recognize as valid simple logical structures such asmodus ponens and modus tollens. More recently, Hugo Mercier and colleagues have been conductingstudies in countries such as Japan (Mercier, Deguchi, Van der Henst,& Yama 2016) and Guatemala (Castelain, Girotto, Jamet, &Mercier 2016). While recognizing the significance and interest ofcultural differences (Mercier 2013), Mercier maintains thatargumentation is a human universal, as argumentative capacities andtendencies are a result of natural selection, genetically encoded inhuman cognition (Mercier 2011; Mercier & Sperber 2017). He takesthe results of the cross-cultural studies conducted so far asconfirming the universality of argumentation, even consideringcultural differences (Mercier 2018). Another scholar who has been carrying out an extensive researchprogram on cultural differences in argumentation is communicationtheorist Dale Hample. With different sets of colleagues, he hasconducted studies by means of surveys where participants (typically,university undergraduates) self-report on their argumentativepractices in countries such as China, Japan, Turkey, Chile, theNetherlands, Portugal, the United States (among others; Hample 2018:ch. 7). His results overall show a number of similarities, which maybe partially explained by the specific demographic (universitystudents) from which participants are usually recruited. Butinteresting differences have also been identified, for exampledifferent levels of willingness to engage in argumentativeencounters. In a recent book (Tindale 2021), philosopher Chris Tindale adopts ananthropological perspective to investigate how argumentative practicesemerge from the experiences of peoples with diverse backgrounds. Heemphasizes the argumentative roles of place, orality, myth, narrative,and audience, also assessing the impacts of colonialism on the studyof argumentation. Tindale reviews a wealth of anthropological andethnographic studies on argumentative practices in different cultures,thus providing what is to date perhaps the most comprehensive study onargumentation from an anthropological perspective. On the whole, the study of differences and commonalities inargumentative practices across cultures is an established line ofresearch on argumentation, but arguably much work remains to be doneto investigate these complex phenomena more thoroughly. 5.4 Argumentation and the Internet So far we have not yet considered the question of the different mediathrough which argumentation can take place. Naturally, argumentationcan unfold orally in face-to-face encountersdiscussions inparliament, political debates, in a court of lawas well as inwritingin scientific articles, on the Internet, in newspapereditorials. Moreover, it can happen synchronically, with real-timeexchanges of reasons, or asynchronically. While it is reasonable toexpect that there will be some commonalities across these differentmedia and environments, it is also plausible that specific features ofdifferent environments may significantly influence how argumentationis conducted: different environments present different kinds ofaffordances for arguers (Halpern & Gibbs 2013; Weger& Aakhus 2003; see entry on embodied cognition for the concept of affordance). Indeed, if the Internet represents afundamentally novel cognitive ecology (Smart, Heersmink, & Clowes2017), then it will likely give rise to different forms ofargumentative engagement (Lewiski 2010). Whether these new formswill represent progress (according to some suitable metric)is however a moot point. In the early days of the Internet in the 1990s, there was much hopethat online spaces would finally realize the Habermasian ideal of apublic sphere for political deliberation (Hindman 2009). The Internetwas supposed to act as the great equalizer in the worldwidemarketplace of ideas, finally attaining the Millian ideal of freeexchange of ideas (Mill 1859). Online, everyones voice wouldhave an equal chance of being heard, everyone could contribute to theconversation, and everyone could simultaneously be a journalist, newsconsumer, engaged citizen, advocate, and activist. A few decades later, these hopes have not really materialized. It isprobably true that most people now argue morein socialmedia, blogs, chat rooms, discussion boards etc.but it is muchless obvious that they argue better. Indeed, rather thanenhancing democratic ideals, some have gone as far as claiming thatinstead, the Internet is killing democracy (Bartlett2018). There is very little oversight when it comes to the spreadingof propaganda and disinformation online (Benkler, Faris, & Roberts2018), which means that citizens are often being fed faultyinformation and arguments. Moreover, it seems that online environmentsmay lead to increased polarization when polemic topics are beingdiscussed (Yardi & Boyd 2010), and to intellectualarrogance (Lynch 2019). Some have argued that onlinediscussions lead to more overly emotional engagement when compared toother forms of debate (Kramer, Guillory, & Hancock 2014). But noteveryone is convinced that the Internet has only made things worsewhen it comes to argumentation, or in any case that it cannot besuitably redesigned so as to foster rather than destroy democraticideals and deliberation (Sunstein 2017). Be that as it may, the Internet is here to stay, and onlineargumentation is a pervasive phenomenon that argumentation theoristshave been studying and will continue to study for years to come. Infact, if anything, online argumentation is now more ofteninvestigated empirically than other forms of argumentation, amongother reasons thanks to the development of argument mining techniques(see section 4.2 above) which greatly facilitate the study of large corpora of textualmaterial such as those produced by online discussions. Beyond the verynumerous specific case studies available in the literature, there havebeen also attempts to reflect on the phenomenon of onlineargumentation in general, for example in journal special issuesdedicated to argumentation in digital media such as inArgumentation and Advocacy (Volume 47(2), 2010) andPhilosophy & Technology (Volume 30(2), 2017). However, asystematic analysis of online argumentation and how it differs fromother forms of argumentation remains to be produced. 6. Conclusion Argument and argumentation are multifaceted phenomena that haveattracted the interest of philosophers as well as scholars in otherfields for millennia, and continue to be studied extensively invarious domains. This entry presents an overview of the main strandsin these discussions, while acknowledging the impossibility of fullydoing justice to the enormous literature on the topic. But theliterature references below should at least provide a useful startingpoint for the interested reader.

What is a core argument. Which of the following is part of the rational core of an argument. What is the rational core of an argument.